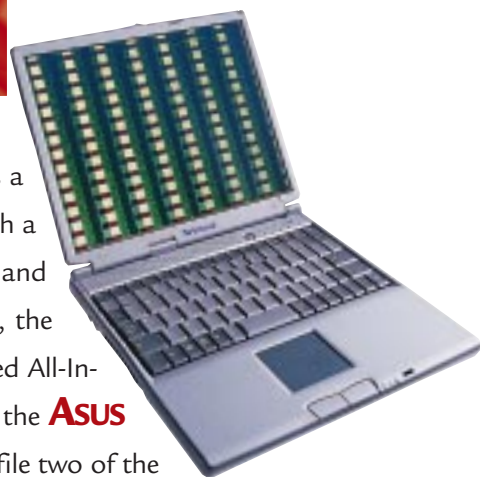# reviews

I t seems that in every issue of *PCW*, a new, faster chip gets a mention in the introduction to our *Reviews* section, and with a **PENTIUM III 550MHz**, a **466MHz CELERON** and Cyrix's new **366MHz MII** arriving in our labs this month, the trend continues. Elsewhere, we take a first look at ATi's updated All-In-Wonder which uses its latest chip, the **RAGE 128**. We push the **ASUS V3800 TNT2 ULTRA** graphics card to its limits, and profile two of the best monitors: LG's brand new, totally flat 17 incher, and an impressive 19in monster from **SAMSUNG.** You'll also read about some great software. We had great fun testing the CD-ROM based **A TO Z ATLAS** of London, finding the quickest routes to all our favourite haunts, and we put a revolutionary new reference tool, **X-PORTAL**, to the test, hunting through reference books and the internet at the same time. Bringing the section to a close, in *Head to Head* we consider the relative merits of a variety of **WEB HOSTING AND CONNECTION OPTIONS**: should you be content with the free space and email address your ISP has generously bundled with your account, or would a leased line and a server in a cupboard at home be a more appropriate solution?

NIK RAWLINSON, REVIEWS EDITOR
NIK_RAWLINSON@VNU.CO.UK

VNU European Labs

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

Contents

Ratings

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

Dan Home Plus 550/S
High-speed system

A high-performance PC which sports the fastest processor and graphics card available.

If you've just forked out a mountain of cash for a 500MHz Pentium III, stop reading this now. Intel is introducing new, higher-clocked processors at a faster rate than ever. The new 'king of the hill' offers a ten percent frequency increase, clocking in at 550MHz. Expect 600MHz and faster soon, but for now this is the fastest Pentium III and thus the fastest consumer PC processor available.

When we reviewed Dan's Dantum 500/D last month, we criticised the fact that the system was fitted with an Ultra ATA66-capable hard drive, but the motherboard couldn't utilise this new evolution of the EIDE interface. The Home Plus solves the problem with the standard Ultra ATA33 chipset on the motherboard being augmented by a dedicated Promise ATA66 controller on a PCI card, to which the 18Gb Western Digital Expert hard drive is attached.

The system has 128Mb of SDRAM fitted, which isn't unusual now but is more than adequate for any application or game you can throw at it. And speaking of games, the graphics card fitted to the system is a 3Dfx Voodoo3 3000. This is the fastest graphics card for 3D games that money can currently buy, sporting 16Mb RAM and a 350MHz RAMDAC for 2D resolutions, higher than any monitor can handle.

The Voodoo3 drives an Iiyama VisionMaster 450 19in monitor, which displays Iiyama's characteristic high quality and will run at 1280 x 1024 at 85Hz with no problem at all, giving a crisp and well-focused picture. But we ran into a problem with the video setup of the Home Plus, which was down to the fact that it's fitted with a Creative Encore DVD package, consisting of a five-speed DVD-ROM drive and dedicated MPEG2 decoder card.
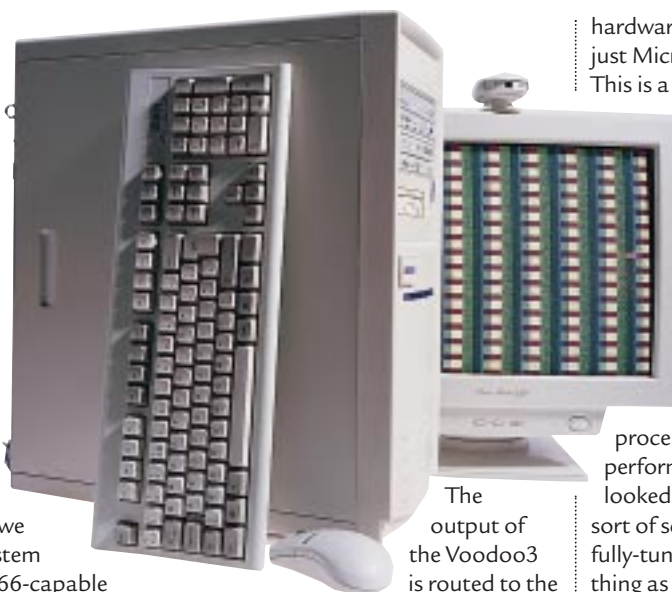
The output of the Voodoo3 is routed to the decoder and then on to the monitor by means of a short pass-through. This often has a slightly detrimental effect on image quality, but in our review machine the video signal was drastically attenuated, losing around 50 percent of its brightness: the pass-through was obviously faulty, which is a one-off type of problem, easily rectified.

The DVD-ROM drive is not the only one in the Home Plus: there's a Hewlett-Packard CD-RW rewritable CD recorder, which is one of the most useful peripherals around, enabling high-reliability data backups and audio CD compilations (copyright permitting).

On the expansion-card side there's also a SoundBlaster Live Value, a great-quality sound card, and a generic 56K modem which is sensibly an ISA rather than a PCI model. Sensible because, with all the other cards, a PCI modem would mean no free PCI slots. As it is, there's only one shared and one ISA slot left. The SoundBlaster drives the now familiar set of Cambridge SoundWorks FourPoint Surround speakers.

The list of features continues with an Intel Create and Share USB video-conferencing camera, and Microsoft SideWinder Gamepad to keep the kids occupied. Unfortunately, all this hardware goodness is backed up with just Microsoft Works Suite 99 in the box. This is a capable package, including Word 97 as well as the integrated Works 4.5 package, but it's not going to be much use with the gamepad.

The Home Plus 550/S is an excellent machine, with a very sturdy build which instilled in us a great deal of confidence. It's unfortunate that we were testing a pre-production processor, which somewhat hindered performance, but this shouldn't be looked upon as an indication of the sort of score that could be achieved by a fully-tuned final model. There's no such thing as a future-proof PC, particularly at the moment, but the specification of the Home Plus means it's just about as close as you can get. You pay for the privilege, of course, but the price is nevertheless reasonable considering the amount of hardware you get for your two grand.

DAVID FEARON

PCW DETAILS

★★★★★

Price £2,258 (£1,922 ex VAT)
Contact Dan Technology 0181 830 1100
www.dan.co.uk
Good Points The fastest graphics card around. Dedicated ATA66 controller. Loads of useful hardware extras.
Bad Points Software is thin on the ground. One-off problem with the DVD decoder's video pass-through.
Conclusion Almost too well specified for a home PC. A first-time user might do better with more software, but there's little to criticise on the hardware front. An excellent system.

PERFORMANCE RESULTS

	0	50	100	150	200	
SYSmark 98						160

	0	1000	2000	3000	4000	
3DMark 99 Max						3915
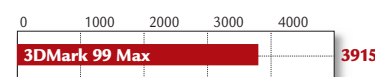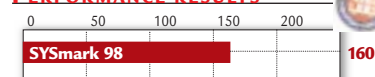
ATi All-In-Wonder 128

Hot on the heels of the Rage 128 comes this high-performance, feature-laden graphics card.

We first saw ATi's Rage 128 chip in the May issue. It has been swiftly followed by a brand new 16Mb All-In-Wonder 128 built around the 128-bit Rage 128GL.
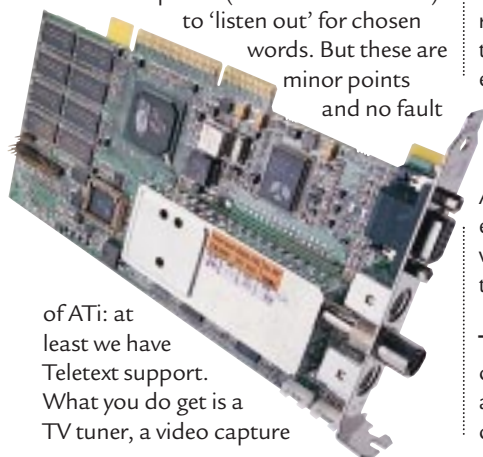
Feature enhancements to the All-In-Wonder are plentiful although US/UK TV incompatibility means there'll be no WebTV for Windows or utilisation of Closed Captions (broadcast on NTSC) to 'listen out' for chosen words. But these are minor points and no fault of ATi: at least we have Teletext support. What you do get is a TV tuner, a video capture card with basic editing, remarkable DVD playback compensation, and support for real-time video compression which includes the MPEG-1 and MPEG-2 formats. All of these features and more are accessed through ATI's beautifully designed MultiMedia Centre which initially appears as a toolbar down the right-hand side of the screen.

With support for 32-bit colour up to resolutions of 1280 x 1024 you'll get true colour gradations and special effects popping up in new titles. We used 3DMark to test the AGP card and noticed a slight drop in performance against ATi's own 32Mb AGP Rage Fury. Visibly, the quality was equal to that of the Rage Fury with rich, vibrant colours flowing seamlessly through the test scenes.

This is an excellent card, marred only slightly by the fact that ATi has announced an expected autumn release of a 32Mb version with an enhanced video decoder chip, stereo audio capture, and an S/PDIF port for full 5.1 Dolby Digital support that will cost only £40 more.

IAN ROBSON

PCW DETAILS

★★★★

Price *£149 (£126.81 ex VAT)*
Contact *ATI Technologies
01628 533115 www.atitech.com*
Good Points *Feature rich, with endearing application support.*
Bad Points *Lack of S/PDIF connector. Mono-audio support. Reduced feature support under NT4 & 3.51.*
Conclusion *Holds its own as a top graphics performer with superb additional features, although it may be worth waiting for the 32Mb version for an even fuller multimedia package.*

PERFORMANCE RESULTS

	0	1000	1500	2000	2500	
3DMark 99						**1608**
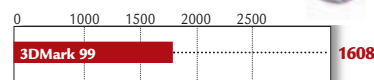
Asus V3800

A graphics card, chock-full of advanced features, which provides excellent image quality.

Asus is better known as a manufacturer of high-quality motherboards. It's therefore surprising that it's one of the first to introduce a graphics card based on Nvidia's new TNT2 chipset.

The TNT chipset released late last year was an excellent performer in 2D and 3D applications. Moreover, it had advanced features such as anisotropic filtering and a stencil buffer. The TNT2 has an identical set of features but, while the older chipset had a clock speed of around 90MHz, the TNT2 starts out at 125MHz.

The V3800 additionally has 32Mb of SDRAM, TV-out, the ability to capture video, and a port for VR glasses. The video-capture feature is heavily dependent on the CPU: you need at least a PII 400 or better to capture full-frame video. Also, the stereoscopic virtual reality glasses will currently only work with Direct3D games.

We first tested the V3800 on a PII 400 with 128Mb of RAM. In our 3DMark 99 Max tests, the V3800 scored just 2,537 points — much lower than the ATi Rage Fury and the STB Voodoo3 3000. This is almost certainly due to the lower clock speed of the TNT2 chipset and memory. The V3800 posed problems on a similarly equipped AMD K6-III 400 PC. After driver installation, the PC would often lock up and its 3DMark 99 scores were lower, at 2231 points. Image quality is excellent, though.

AJITH RAM

PCW DETAILS

★★★★

Price *£191.52 (£163 ex VAT)*
Contact *Asus 0181 307 2800
www.asus.com.tw*
Good Points *Advanced features. Full OpenGL ICD. Excellent image quality. Potential for over-clocking. Video capture ability.*
Bad Points *Mediocre performance. No hardware support for DVD playback.*
Conclusion *A fully featured graphics card that doesn't quite realise its potential.*

PERFORMANCE RESULTS

	0	1500	2000	2500	3000	
3DMark 99						**2537**
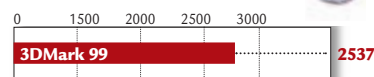
Compaq DeskPro EN
Space Saver 500

A small-footprint PC that combines power and performance in a well-designed case.

Apart from the standard tower and desktop models, Compaq's Deskpro EN Series of business PCs contains one other interesting model, the Space Saver. And small it is: the ubiquitous beige case, still essentially a desktop PC, has a small footprint indeed.

The Small Form Factor chassis measures a mere 31.8 x 9 x 37.1cm (WxHxD) and is possibly the smallest desktop we've seen. What's more, it achieves this without skimping on specification or performance. Available either with a standard CRT monitor or TFT screen, we were supplied with a 14.5in TFT, which makes a big difference to looks. Aesthetically, the system is compact and unfettered by external speakers or other peripherals which would otherwise ruin its somewhat functional appearance.

Essentially a business machine, our review model was supplied with Windows NT 4.0 as the chosen operating system, although it's also available pre-installed with Windows 95 if you wish. At the heart of the machine is the current Intel flag-bearer, the Pentium III. In this instance it was running at 500MHz with 512Kb of Level 2 cache. The sensible case design makes it a cinch to get to the motherboard and internal components. Once there, the processor is housed under a spring-loaded compartment which holds a 10Gb SMART II Ultra ATA hard disk, a 24-speed CD-ROM drive and the ubiquitous 3.5in floppy drive. In fact, space is at such a premium that even the CD-ROM drive is a notebook-style slimline version.

For something so small the Space Saver is relatively easily accessible, even if the upgrade options are limited. The Intel 440BX motherboard benefits from

Small, sleek and very fast, the DeskPro Space Saver 500 is great to look at

on-board AGP graphics, but has one free PCI and one shared ISA/PCI slot for essential additions you may need such as a SCSI card or a modem. The two USB ports should help a little too, as the current trickle of USB peripherals is beginning to turn into more like a small stream. According to the accompanying blurb, there are two external and one internal expansion bays, but it doesn't take a genius to realise that these are already taken up by the hard disk, CD-ROM drive and floppy drive.

The 128Mb of SDRAM upgradeable to 256Mb with the single free DIMM, coupled with the Pentium III processor, make this small PC a big performer — as proved by our lab tests. SYSmark 98 came up with a result of 219, a very impressive achievement. The Space Saver is no slouch. In fact, you'd be hard pushed to find better system performance on any high-end home PC currently on the market.

The installed ATi Rage Pro 3D Turbo is an able performer and has 8Mb of

RAM. As mentioned there are no external speakers, but the DeskPro boasts 16-bit full-duplex audio with Compaq's Premier Sound capabilities. Unfortunately, the sound first has to travel through the case from the internal speaker, which muffles the results.

Compaq's 14.5in (viewable) TFT monitor will run comfortably at a screen resolution of 1600 x 1200 in 65,000 colours and we found the picture quality clear, with a wide viewing angle perfect for presentations. This particular DeskPro was never likely to be packed with software, the Compaq support CDs excepted; only NT4.0 comes supplied as standard.

As well as business users, the image-conscious user may want to have a look at this DeskPro Space Saver. If you're a real gadget fan or just a paranoid late-nineties PC user, you may even want to try Compaq's Fingerprint Identification Technology for added security. We weren't supplied with this, but it is available on this model for less than £100.

JIM HARYOTT

PCW DETAILS

★★★★

Price System: £1,616.80 (£1,376 ex VAT); TFT 450 monitor: £974 (£829 ex VAT).
Contact Compaq 0845 270 4000
www.compaq.co.uk
Good Points Thoughtful design and handsome looks. Great performance.
Bad Points Price. Lack of upgradeability.
Conclusion Despite its size, the Space Saver is designed for easy servicing. Small, sleek and very fast, it's great to look at. Bearing in mind the business nature of the product, price and upgrade potential are not such important issues.

PERFORMANCE RESULTS

	0	100	150	200	250
SYSmark 99					219
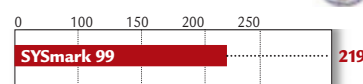
Tiny Home Executive 466
Family PC

RECOMMENDED
PERSONAL COMPUTER WORLD

This good-value home PC is one of the first to benefit from the new 466MHz Celeron chip.

It seems that each month brings at least one new chip, and this month is no different. Not only do we have the first 550MHz Pentium III *[page 77]*, but we also got our hands on this, one of the first PCs built around Intel's latest addition to the Celeron product line, running at 466MHz.

This is the first Celeron to be available in only the Socket 370 PPGA format, sitting flat on the motherboard rather than upright, although some manufacturers are offering Socket 370 processors on an adaptor riser card which allows them to use Slot 1 motherboards. These are neither made nor endorsed by Intel, so some users may be glad to see that Tiny has given this a miss and plumped instead for a Socket 370 motherboard. The pay-off is that this makes upgrading to a Slot 1 Pentium II or III impossible without also replacing the motherboard.

Upgrade paths were limited in other directions, too. The case had a single free internal drive bay, so couldn't be used to host a CD burner or Zip drive that would require the insertion of removable media. In a case so small, it's little wonder that it has only one free shared and one free PCI slot. That's not as bad as it sounds though, as the graphics card and internal 56K modem have already been found homes, and sound is taken care of by an on-board SoundBlaster AudioPCI 64V chipset.

These points aside, this is a well constructed machine, and when all the bundled extras are taken into consideration, you get a lot for your money. Tiny has thrown in not only an Epson Stylus Color 440, capable of photo-quality printing at 720dpi, but also a Mustek scanner with a maximum interpolated resolution of 9600dpi, connecting to the PC by USB. OCR software is supplied and pre-installed.

The rest of the generous software bundle is pre-installed too, including Word 97 and Microsoft Money. Along with a joystick and headphone/mic set for the bundled ViaVoice software, it's no wonder this PC arrived in seven boxes.

Graphics are managed by a Hercules Dynamite TNT graphics card with 16Mb on-board, and main system memory runs to 128Mb on a single DIMM, leaving one slot free. Communication with the outside world is facilitated via a V.90 K56Flex internal modem, while for those after a quick entertainment fix, the DVD-ROM drive should suit movie lovers. The hard drive is a 10Gb UDMA model, offering plenty of room for storage while keeping an eye on future resource-hungry applications.

Extra 'hot key' buttons on the keyboard give instant access to volume and CD controls while leaving four buttons free for user customisation. The Executive 466 was also supplied with a first-class Microsoft Intellimouse. The monitor is an excellent Taxan Ergovision 750 TCO95 which,

The extensive bundle makes it particularly attractive to families

with a 16in viewable diagonal, provides a rock-steady image that's comfortable to use for extended periods. It also offers the option of either D-SUB or BNC connection.

The inside of the 466 is tidy and well organised, offering easy access to the processor and memory slots. The back panel of the case is colour coded for easy set up, and the instruction manual is a clearly written and well organised binder.

We were impressed with this PC. Its small and well sculpted case would fit well into any home environment, and the extensive bundle makes it particularly attractive to families and first-time buyers. Although we were initially concerned about the apparent lack of expansion room, many peripherals such as Zip drives now have parallel or USB connection options and it's unlikely that the average user would need more than the two expansion card slots left empty.

NIK RAWLINSON

PCW DETAILS

★★★★★

Price *£999 (£1,173.83 ex VAT)*
Contact *Tiny 0800 821333 www.tiny.com*
Good Points *Extensive bundle. Loads of memory. Good monitor.*
Bad Points *Limited options for upgrading.*
Conclusion *A good buy for the home user.*

PERFORMANCE RESULTS

	0	50	100	150	200	
SYSmark 99						**145**

	0	500	1000	1500	2000	
3DMark 99 Max						**1858**
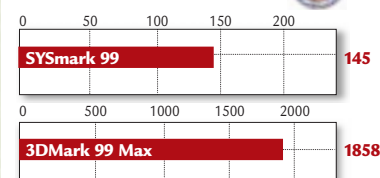
Watford Aries 3205
Speed on a budget

If you don't want the expense of an Intel inside, a Cyrix-powered PC offers good value for money.

Cyrix chips have always been seen as cost-effective options for PC construction. Generally priced well below their Intel counterparts, they offer a value-for-money option for the less power-hungry user. In terms of raw speed they're not far behind the more pricey alternatives, so we put the first Cyrix MII 366MHz processor we've seen in the *PCW* office, to the test.

The Aries arrived in a huge plain case dominated by two green buttons on the face. Opening it up, it wasn't entirely evident why Watford had chosen to use such a large case. There was a clear 8.5cm between the outer edge of the tallest card and the side of the case, and even the 5.25in drives and the power supply didn't fill the full width. On the plus side, whereas removing the blanking fascia on such a case often leaves an ugly hole, removing these particular examples revealed a neat opening with all ugly sections covered by matching plastic.

Memory is supplied as a single 128Mb DIMM, leaving two further slots free for future upgrading. It also has one free ISA and two free PCI slots, although the positioning of the sound card and the DVD decoder card means that the audio cable, carrying DVD sound between the two, is awkwardly positioned. Installing another PCI card in the spare slot inbetween will require some manoeuvring or, more sensibly, the repositioning of one of the cards.

Nevertheless, we were glad to see the implementation of hardware DVD decoding, which is often a more efficient alternative to the software option and results in fewer dropped frames. The drive itself, replacing a CD-ROM drive, was Creative's 5X Encore with a bundled copy of Wing Commander IV. First-time PC users will welcome the 'Aries Rescue Kit': Rescue Me! and PC-Cillin 98 installed and dropped onto the taskbar for instant access.

Watford Electronics has provided well for a long life, and the Aries includes a 16.8Gb IBM DeskStar hard drive. Not only will this be more than adequate for today's average user, but it should also last for years and still not feel unduly pokey.

A pair of Diamond cards take care of sound and graphics. The former is handled by the Diamond MX300, sending output to a pair of 240W speakers, while graphics are processed by a Diamond Viper V550 card with 16Mb on-board. We were pleased to see that even in the Super Socket 7 motherboard this card utilised an AGP interface. The motherboard itself, an ATX Asus P5A, also supports 100MHz PC100 RAM. We were disappointed with the bundled AOC Spectrum 7GL monitor. Although capable of a flicker-free refresh rate of 75Hz at 1024 x 768 resolution, it displayed a particularly grainy image. But it did have an extensive and well-organised OSD with a push-and-twist selection button used to access all options. As well as the usual geometric adjustments and degauss function, it sported two preset colour temperatures and a further user-definable colour temperature option.

More than adequate for the average user and should last years

All in all, this is a sturdy machine pitched at a very competitive price. Performance was a little disappointing when compared to the likes of the Pentium II and III processors — which is only to be expected — but this computer has to be viewed in context: for a business user who wants a sturdy PC for general office tasks, you won't go far wrong. The Cyrix MII ran both our 3D and business application benchmarks flawlessly, leaving us confident that this is a PC that won't let its users down.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *£940 (£800 ex VAT)*
Contact *Watford Electronics
01582 745555 www.watford.co.uk*
Good Points *Competitive price.
Sturdy performance.*
Bad Points *Not particularly fast.
Poor monitor.*
Conclusion *A wise buy for the small business user.*

PERFORMANCE RESULTS

	0	50	100	150	200	
SYSmark 99						94

	0	500	1000	1500	2000	
3DMark 99						911
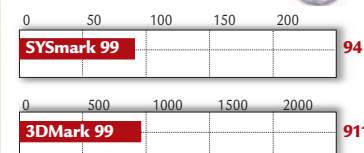
McAfee VirusScan Platinum

Protect and survive is the name of today's game, so beat that bug and vanquish that virus.

McAfee VirusScan is one of the top anti-virus products currently available. The Platinum version stands out mainly because of its extra software utilities which come courtesy of CyberMedia and include First Aid 98 for fixing PC problems, and Oil Change which checks the internet for software upgrades, new drivers and bug-fixes. You can also beef up data and internet security with PGP (Pretty Good Privacy) encryption and Guard Dog.

VirusScan is a sophisticated product that will serve you well. VShield runs as a background task and scans files when they are created, renamed, copied or executed. Email attachments and internet downloads are also checked along with ActiveX and Java applets, and you can even block access to specific internet sites. On-demand scanning is provided too, and a scheduler utility allows this to be run at regular intervals.

You can move infected files to a quarantine area and deny access to them, delete them or let VShield try to repair them. The last may not always be successful, though, as file viruses often muck around with genuine program coding, so you should always partner anti-virus measures with data backup. We tested VirusScan with 50 genuine viruses and although it detected them all, it was unable to repair 17 infected files.

A sig file is used to identify viral code during scanning, and free lifetime updates are included in the price. With many new viruses using the net and email to spread themselves, anti-virus software is becoming a 'must have'. Although the extra utilities are not up to much, VirusScan will provide all the protection you need.

DAVE MITCHELL

PCW DETAILS

★★★★

Price *£59.95 (£51 ex. VAT)*
Contact *Network Associates 01753 827500* www.mcafee.com
System Specification *Windows 3.x, Win95/98, 54Mb free hard-disk space (all utilities), 8Mb of RAM.*
Good Points *Top virus detection rates and free lifetime upgrades included.*
Bad Points *Extra utilities are of limited value.*
Conclusion *Put some armour around your PC with this essential anti-virus product. It offers particularly good protection against internet-borne viruses.*

TextBridge Pro 9.0

Nice'n'easy does it with the new version of this tried and tested optical character reading package.

Xerox has released its rival to Caere's OmniPage 9.0 OCR package, in the form of TextBridge Pro 9.0. It claims that this latest release offers improved accuracy alongside a simplified user interface.

Your first job is to set up the software to work with your scanner so it can adjust the scanning settings to suit your documents. Before you can start the OCR process you have to tell the software whether the document is text only or includes images. TextBridge 9.0 can handle colour pages, although colour text is still beyond its capabilities unless it's zoned as a graphic.

Additionally, you have to select a more detailed description of your document from the list provided, which ranges from simply any document in colour or black and white, to the more specific legal document or magazine page. When you've chosen these parameters, the whole process can be

carried out automatically, or you can control it manually if you prefer.

Pro 9.0 has improved on its predecessor's accuracy in some areas. It handled unusual fonts with ease, and when we chose to convert recognised documents to HTML for use on the web, it managed to retain most of the formatting. Nevertheless, it still had a lot of trouble with tables, making a real mess of the Excel spreadsheet we used, and documents containing graphics are still a challenge it doesn't really meet.

Results using plain Times New Roman text were fine, although the typeface had been shrunk for some of the page, which is a disappointment after the near 100 percent accuracy provided for this type of document in TextBridge Pro 98.

URSULA TOLAINI

PCW DETAILS

★★★★

Price *£69 (£58.72 ex VAT)*
Contact *Xerox 0118 9814230* www.scansoft.com
System Specification *Windows 95 or NT 4.0, 486 PC, VGA monitor, 24Mb of RAM (32Mb recommended), 20Mb free hard-disk space, TWAIN scanner.*
Good Points *HTML conversion facility. Improved accuracy for unusual fonts. User-friendly interface.*
Bad Points *Inaccurate recognition of spreadsheets and documents containing graphics. Minor issues with plain text recognition.*
Conclusion *TextBridge continues to offer above-average OCR accuracy, and the HTML conversion feature is a real bonus, but this isn't a huge leap forward from its predecessor.*

LG Flatron 795FT

Flatter than a pancake, this CRT screen will make you give your own monitor a serious re-think.

Most modern 17in monitors are of the FST variety and so by definition have a flatter, squarer tube. Peer closely at one, though, and you'll see it's not actually flat at all — and nor can it be. The century-old technology behind CRT displays relies on a screen that is formed from part of the surface of a sphere (or a cylinder for Trinitron-type screens). Or rather, it used to. Monitor manufacturers have come up with ways to produce CRT screens which are totally flat, and the latest is the Flatron 795FT from LG Electronics.

To the casual observer, the Flatron looks just like any other 17in monitor, albeit one with a generous 16in viewable diagonal and a four-port USB hub. But take a closer look and it soon becomes apparent that this is something different:

no matter at what angle you examine the screen, you'll find no trace of curvature.

Flat-screen CRTs aren't just a design exercise; they also have several important advantages in use. The Flatron web site explains these in more detail, but suffice it to say that a flat glass surface is less prone to glare from ambient light than a curved one, and it can be viewed from wide angles with no image distortion. LG has restricted the Flatron's electromagnetic radiation and it's fully TCO 99 compliant.

Once you're used to the Flatron's

two-dimensional display — and it does take some getting used to — you'll find it hard to go back to that goldfish-bowl screen you didn't think you had. Colours are clear and vivid, contrast is crisp, and with a maximum resolution of 1600 x 1200 at 75Hz, the Flatron is a versatile performer.

JULIAN PROKAZA

PCW DETAILS

★★★★

Price *£329 (£280 ex VAT)*
Contact *LG Electronics 01753 500400 http://flatron.lge.co.kr*
Good Points *Totally flat screen. Superb image quality. Comprehensive digital image controls.*
Bad Points *Comparatively high price.*
Conclusion *There's no doubt that you're paying a premium for the Flatron 795FT, but if you're at all concerned about what's producing those images you spend all day looking at, this monitor is worth consideration.*

Samsung SM 900IFT

RECOMMENDED PERSONAL COMPUTER WORLD

This superb shadow mask monitor comes **closest yet** to matching aperture grille quality.

Traditional CRT (cathode ray tube) technology is enjoying something of a renaissance, with the primary development being near totally flat screens. This new Samsung, which uses its own tube technology, is a 19in model with 18in viewable diagonal. Its flat-screen tube differs from that of its competitors, Sony and Mitsubishi, in that it's shadow mask rather than aperture grille based, but the 900IFT represents a narrowing of the difference between them in terms of quality.

This is a superb display, with images that are hard to criticise in terms of resolution and edge-to-edge focus. It has to be said that it's not quite as sharp as its two rivals, but the difference is highly marginal. Colour performance is excellent, and exhibits the slightly less vibrant colour characteristic of shadow masks, which many people still prefer.

As well as superb image quality, the

900IFT possesses unusually tasteful and attractive styling, and the OSD (on-screen display) controls are mounted on a panel which, given a gentle push, slides out in a very sexy fashion. Unusually for a high-end monitor there are no convergence controls to correct gun misalignment; but then, the unit didn't need them.

The quality of the 900IFT makes it

perfectly possible to work at a resolution of 1280 x 1024 at 85Hz with no hint of eyestrain. And for those with sufficiently good eyesight, the display continues to be extremely sharp at 1600 x 1200, at which it will manage 75Hz vertical refresh. If you're in the market for a high-end 19in display, the 900IFT delivers the goods. Definitely one for the shortlist.

DAVID FEARON

PCW DETAILS

★★★★★

Price *£575 (£489ex VAT)*
Contact *Samsung 0800 521 652 www.samsungelectronics.co.uk*
Good Points *Superb all-round performance. Good looks.*
Bad Points *Shadow mask technology still can't quite match aperture grille, but it's very close. USB hub not included as standard.*
Conclusion *The best shadow mask display we've seen.*

Brother MP-21C

A trimmer travelling printer with no bulky accessories and no need for mains power.

Brother's latest mobile inkjet printer, the MP-21C, is designed to trim down the number of bulky accessories you have to carry to print on the move. It does away with both AC adapter and printer cable, swapping them for a slim PC Card Cable and a Printer Interface Card which slots into a free PC Card slot.

Instead of using the mains, it draws all its power from the notebook's battery. Brother claims that it consumes 2.5-3W while printing, and just 0.5W in standby. In our tests we found that printing just over 50 pages of text cut battery life by 27 percent. This works out at a loss of about eight minutes of life for a ten-page

document — not too high a price to pay for the convenience of printing wherever and whenever you need.

Despite its modest appetite for power, there are a couple of serious drawbacks with the MP-21C — print quality and speed. It uses two cartridges: black and cyan for mono printing, and a lower-capacity magenta and yellow for colour output. But even in Super Fine mode at the maximum resolution of 720dpi there's severe horizontal banding and text is blurred. Print speed also falls

short of the promised 1.7ppm at just 0.42ppm, and since there's no sheet feeder you'll have to feed each page through individually which further slows things up. There's a plastic guide intended to help keep the paper straight, but if you line up a page with this, the printer won't work and you have to use the printed white guide instead — not very helpful.

URSULA TOLAINI

PCW DETAILS
★★
Price £249 (£211.91 ex VAT)
Contact Brother 0161 931 2354
www.brother.com/uk/index.html
Good Points Light, compact design. No need for mains power. Low power consumption.
Bad Points Poor quality output. No sheet feeder. Slow print speed.
Conclusion If you have to print while you're on the road, the Brother MP-21C will do the job. But if you need high print speed and quality, wait until you get back to the office.

Agfa ePhoto CL50

A digital camera with a fuller figure and sporting a rather snappy sunlight trap.

LCD screens are wonderful things, especially on digital cameras, not only for aligning shots but also for reviewing your pictures before downloading them to the PC. This saves download time, and space in the camera's memory. But if you take pictures outside, away from the power supply, the LCD screen presents problems: it drains the batteries fast, and, because it 'whites out', you often can't see the picture clearly.

The most unusual feature on this camera is the sunlight trap on the LCD. Above the LCD there's a little flap, under which sits a prism. This collects ambient light and directs it down behind the LCD. It has two main functions: to cut down on battery usage, and to avoid the 'white out' problem.

The battery-life enhancement is welcome, but the 'white out' issue hasn't been solved. The prism makes it

marginally easier to see the screen but in bright sunlight it's still not enough.

The ePhoto CL50 has a viewfinder which is positioned close to the lens, so any shifting of perspective is kept to a minimum. It also lets you review your pictures before they are even written to memory.

This camera is chunky in look and feel — a little like a compact 35mm camera. It has a 3X optical zoom, equivalent to a

34-102mm lens on an SLR camera, and a 1.3 million pixel CCD which will give an optical resolution of 1280 x 1024. Image enhancement technology on the camera will boost the resolution through interpolation to 1600 x 1200, but the benefits are questionable. You'll be able to fit 24 images at 1280 x 1024 onto the supplied 8Mb SmartMedia card.

ADELE DYER

PCW DETAILS
★★★★
Price £645.08 (£549 ex VAT)
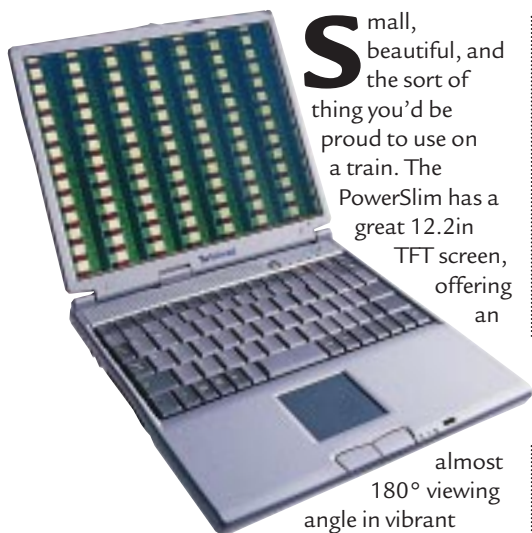**Contact** Agfa 0181 231 4906
www.agfahome.com/ephoto/cl_50.html
Good Points Generous 8Mb SmartMedia card.
Bad Points Chunky look and feel.
Conclusion Decent value for money.

Twinhead PowerSlim 300

Slim and good-looking, this notebook makes an attractive — if quirky — travelling companion.

Small, beautiful, and the sort of thing you'd be proud to use on a train. The PowerSlim has a great 12.2in TFT screen, offering an almost 180° viewing angle in vibrant colour. And it folds back almost flat to cope with most lighting conditions. However, the display panel is very thin and even gentle knocks cause ripples in the image.

The PowerSlim truly deserves its name, being less than 1in thick and weighing only 1.67kg. The core is a 300MHz Pentium and 32Mb RAM expandable to160Mb. At the back there's the usual parallel, serial, VGA and multi-function PS/2 ports, and the socket for the integrated 56K modem.

There's a single PC Card slot on either side, and to the right is an infra-red port. The keyboard is large and fairly comfortable to use but we found the space bar unresponsive, often ending up with a long string of words joined into one. The strange position of the right-hand Windows key means it's often hit instead of the right cursor, which is annoying, but the main problem is the touchpad, and controlling the cursor is difficult.

To minimise the unit's size, all drives are external. The CD-ROM has its own dedicated connector, while the floppy, which is not so dependent on impressive transfer rates, contents itself with hooking up to the parallel port.

A nice touch is that pressing the power button to switch it off puts the PowerSlim through the Windows shut-down process, and the package includes a handy carrying case for users on the move.

NIK RAWLINSON
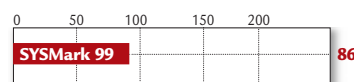
Danmere Backer32

Let your video lead a double life: with Backer32, it can serve as a 4Gb **data backup unit.**

Many of us are put off backing up valuable data by the high cost of tape drives. But now Danmere offers a budget-priced alternative. Its Backer32 uses a standard VCR for storing up to 4Gb on a 240-minute videotape using Long Play mode.

Backer32 is available as an internal ISA card or an external box connected to the parallel port, and for the latter you must have a PC that supports ECP-only (Extended Capabilities Port) mode. A video cable with two DIN plugs and a SCART socket is included, but Danmere can supply different cables.


Backup requires some manual intervention as you select files from a simple Explorer-style interface and place the VCR in Record mode before starting the copy. However, the only way to monitor progress is to connect a TV. If all is well you should see patterns of black bars, rather like static, with the current file number displayed in the corner. Once the copy is finished you manually stop the VCR and rewind the tape. An optional parallel port infra-red remote unit (£24.95 inc VAT) allows the VCR to be controlled directly from your PC.

Backup speeds are around the same as those of a parallel port tape drive. With high speed and full data compression selected, the best you'll see is 9Mb/min, so securing a large hard disk will be an overnight affair. But as it can't verify data while writing, this extra task will double your backup times.

Backer32 is a smart idea that will appeal to those on a tight budget. Providing you're happy with your VCR leading a double-life, you won't find a cheaper option.

DAVE MITCHELL
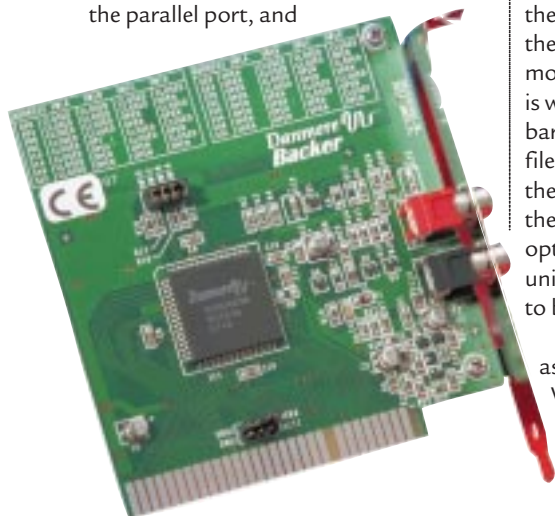
VideoLogic Neon 250

A Power VR graphics card with an impressive pedigree: it powers Sega's Dreamcast console.

The Power VR chipset from 3Dfx uses an unconventional method for rendering images. Traditional accelerators like Voodoo render a 3D image in its entirety: i.e. the 3D image that is immediately visible and other elements which remain hidden. This results in wasted clock cycles and consumes more memory. Power VR uses a series of clever algorithms to analyse the scene before rendering the image, which is a far more efficient method.

There were drawbacks, though. The original Power VR chipset depended on the host CPU to analyse most of the 3D scene, and the chipset had compatibility problems with Microsoft's DirectX 5 API. This second-generation Power VR Neon 250 has no such problems: this is the technology that powers Sega's Dreamcast console. An AGP 2X card, it has 16Mb of SDRAM. The 3D image sorting, once handled by the CPU, is now performed by the graphics chipset.

Advanced features include 32-bit rendering, trilinear and anisotropic filtering, and motion compensation for DVD playback. Power VR doesn't use a Z-buffer, so memory usage is better than its rivals. It also has a full OpenGL ICD.

In our 3DMark 99 Max tests, the Neon 250's score put it well ahead of ATi's Rage Fury and it was only slightly slower than 3Dfx's Voodoo3 3000. Its advanced features, high performance and superb image quality make it a winner.

AJITH RAM

PCW DETAILS

★★★★★

**Price** *£141 (£120 ex VAT)*
Contact *Videologic 01923 260511*
www.videologic.com
Good Points *High performance. Excellent image quality. Advanced 3D features. Hardware support for DVD playback.*
Bad Points *No AGP 4X support, but this isn't a major problem.*
Conclusion *A powerful, fully-featured graphics card that deserves to be a success.*

PERFORMANCE RESULTS

0	1500	2000	2500	3000

3DMark 99 Max — **3097**
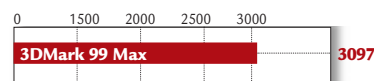
Cakewalk Home Studio 8

A whole studio's worth of effects and tools, including graphical audio mixing, for home musos.

Home Studio is Cakewalk's entry-level sequencer, although you might be surprised when you see what's on offer. As well as providing the essential tools for manipulating MIDI and audio, this release provides StudioWare panels to allow remote operation of MIDI instruments *(pictured)*, real-time audio track mixing and support for DirectX audio plug-ins. So it's not all entry-level stuff.

If you're just starting out, video tutorials are supplied on the CD to guide you through the basics. Setup is reasonably straightforward. Audio hardware is detected and configured automatically, while MIDI ports just have to be selected for use.

It's now possible to synchronise audio to video in Home Studio. When a file is imported — and these can be AVI, MPEG or QuickTime files — its audio content is placed on a separate track. This makes it possible to insert, say, a voiceover into a home video. Video clips can be resaved with a new sound track in place. Also new in this version is a collection of MIDI effects which include various delay and echo settings, as well as an arpeggiator and quantise and velocity effects.

There are 256 tracks for MIDI playback but only four are available for audio, which some users might find restrictive. A welcome addition in this department, though, is that volume fades and pans can be drawn directly onto audio parts, which makes automation a breeze. Bundled audio effects include reverb, chorus, pitch shift and EQ.

While aimed at the beginner, there's clearly plenty here to keep the interest of all but the most advanced user. The only real drawback is the available number of audio tracks. Otherwise, a sound buy.

STEVEN HELSTRIP

PCW DETAILS

★★★★

Price *£99 (£84 ex VAT)*
Contact *Et Cetera Distribution 01706 228039* www.cakewalk.com
System Specification *Windows 95/98, 100MHz Pentium, 16Mb RAM.*
Good Points *Support for DirectX plug-ins. Graphical audio mixing.*
Bad Points *Limited to four audio tracks. Effects must be applied to audio tracks once configured.*
Conclusion *A whole studio for less than a ton.*

Olympus Camedia C-830L

Great-quality digital photography with this compact camera — even on macro close-ups.

The C-830L could easily pass for a conventional 35mm compact. In most respects, it's identical to its predecessor, the C-840L: fixed focal length lens, sliding lens protector, a few buttons and small LCD panel along the top. Beneath the surface though, there are some subtle but useful enhancements and additions, including a non-compression SHQ (super high-quality) mode and better power efficiency.

At its heart is a new 1:2.7in, 1.31 megapixel CCD which, according to

Olympus, is faster and more accurate than that of its predecessor. There's no optical zoom, only a digital 2X equivalent, which is a shame. Some manual override for controlling depth of field and exposure would have been nice, too. Exposure control is fully automatic with aperture variable between f2.8, f5.6 and f11. Shutter variation is between 1/2 and 1/500th of a second.

Image quality is excellent. Colours are generally well balanced, especially on close-up subjects when using the flash. For really close-up work there's a macro mode which lets you take sharp images from as close as a few inches. Other features include the ability to take a fast sequence of pictures (at the lowest resolution).

The Camedia comes with a 4Mb Smartmedia flash card which will hold 60 standard-quality images,

18 high-quality, or nine super high-quality images. Options for getting photos from the camera into your computer include the supplied serial lead and software, an optional card reader, or the ingenious floppy-shaped Flashpath adapter. A video lead (supplied) will allow you to play back images through a TV.

MICK ANDON

PCW DETAILS

★★★

Price £399.99 (£339.57 ex VAT)
Contact Olympus 0171 250 4616
www.olympus-europa.com
Good Points *Excellent picture quality and colour accuracy. Compact and discreet design, if a little dated: could pass for a 35mm camera.*
Bad Points *No zoom. No manual override.*
Conclusion *A little short on bells and whistles but big on picture quality. Robust, reliable, and one of the cheapest 1.31 megapixel models on the market.*

Compaq LN16

A high-end mono laser printer for large office and workgroup environments.

'**I**nsert the guide shafts at the both ends of the unit along the guide rail on the printer…' are rather confusing instructions for installing the toner cartridge in this mono laser printer. Additionally, it unfortunately scored a rather middling grade of 68.5 percent in our print quality tests. That said, this was mainly caused by its disappointing handling of graphics at standard 600 x 600dpi quality. But text reproduction was excellent at this setting and the LN16 scored top marks in virtually every area. For the image-conscious, the driver includes the option to boost quality to 2400 x 600dpi when printing pictures.

Toner was laid down very evenly, and fine white lines and objects laid down within solid black areas had clean, sharp edges. It was also able to demonstrate clear differentiation between closely related tones. The well-organised driver included options for two-up and four-up printing, placing as many as four pages

on one sheet. This was in addition to its ability to scale the output on a range extending from 25 to 400 percent. It also catered for a range of five paper sizes and five different envelopes, but unfortunately it had no 'custom' paper size option. Serif text as small as 3pt was clearly legible. The Compaq LN16 uses PostScript 2 and PCL6 emulation.

This printer didn't do too well on the positional test, though. Feeding a piece of paper through the printer twice and printing the same pattern each time revealed that it didn't print in the same position on both occasions. In our tests, printing ten full pages of text took 1min at 600dpi and 57sec at 300dpi — helped, no doubt, by the 125MHz processor and 12Mb standard memory installation. Normal business letters, involving less coverage, would take less time to print.

NIK RAWLINSON

PCW DETAILS

★★

Price £1,318.36 (£1,122 ex VAT)
Contact Compaq 01252 744408
www.compaq.co.uk
Good Points *Even toner distribution.*
Bad Points *No custom paper size. Poor positional results. Expensive.*
Conclusion *A disappointing performance overall.*

NetGraphics Studio 2

Good value, easy-to-use software to help make your web site a sight to behold.

We had been expecting NetGraphics to be something along the lines of Macromedia Fireworks or Adobe ImageStyler, allowing the user to generate original graphics for use on the internet. This is not the case, however. Its purpose is rather to take pre-prepared images and convert them into a more web-friendly format.

You may well find that the image you need has been bundled amongst the 2,000 included in this package. If not, you can load your own and begin the process of optimisation.

The first thing to set is the size of the image on your page. This can be specified numerically, by entering measurements in form fields, or by dragging handles on your image. To make things easier, the aspect ratio is maintained by default, although this can be disabled.

Once the background has been set — and here you can choose from another image, a colour or a transparency — it's time to save the image. NetGraphics will analyse your work and make a recommendation, either JPEG or GIF.

In each case, a preview shows the effect this has had on the image. The package also keeps track of how long the image will take to download over a variety of links. The second function of NetGraphics is the facility to drop textures into letters using any of the bundled textures or an image file saved on disk.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *£39.99 (£34.03 ex VAT)*
Contact *MediaGold 0171 372 9733*
www.hemera.com
System Specification *Windows 95/98/NT 4.0, 486 processor, 8Mb RAM, 15Mb free hard-disk space, CD-ROM drive, 256-colour VGA display.*
Good Points *Easy to use. Bundled images. Very cost effective. Low hardware requirements.*
Bad Points *None to speak of.*
Conclusion *If it's got the features you need, the price makes it a good buy.*
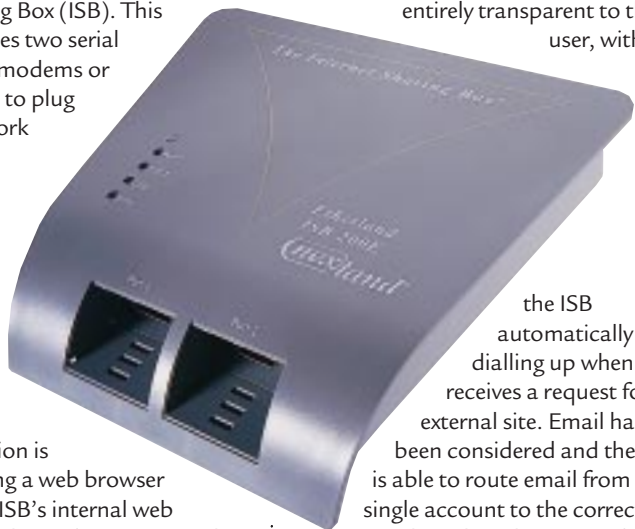

Nexland ISB 200E

Nexland's Internet Sharing Box gives network users inexpensive access to the internet.

While the number of Windows-based networks has grown, access from the network to the internet remains a problem. Nexland has a simple solution in the form of the Internet Sharing Box (ISB). This device comprises two serial ports to allow modems or ISDN adapters to plug in, plus a network connection to interface with your network. This allows a single account to be shared between everyone on the network.

Configuration is performed using a web browser pointed at the ISB's internal web server. Client-side configuration can be achieved either by physically setting up each client with an IP address, or by using the ISB's built-in DHCP server which automatically assigns the correct parameters when a machine requests it.

From here on in, the process is entirely transparent to the user, with the ISB automatically dialling up when it receives a request for an external site. Email has even been considered and the ISB is able to route email from a single account to the correct user, based on the name of the person to whom the email is addressed.

Multiple users sharing a single modem line can lead to poor performance, and due to the way AOL works you can't use one of its accounts to provide shared access. Despite this, for smaller organisations the ISB presents a fairly simple way of getting employees on the internet and company-wide email.

DAVID LUDLOW

PCW DETAILS

★★★★

Price *£246.75 (£210.00 ex VAT)*
Contact *Nexland 0181 391 6900*
www.nexland.com
Good Points *Provides a simple approach to sharing an internet and email account.*
**Bad Points** *Not the best configuration utility, and manuals are only provided on CD.*
Conclusion *For small businesses wanting to provide both the internet and email for their employees, then this is probably the easiest way of achieving that goal.*

Samsung ML-5100A

An inexpensive printer which sports a USB connection and is ideal for the home setup.

The ML-5100A is a compact printer with a footprint small enough to find room on most desks. Its input and output paper trays hold 150 and 100 sheets respectively, and around the back, as well as the usual parallel connection, it sports a zippy USB port.

This printer is aimed firmly at the less expensive end of the laser market and, in common with many of its competitors, it supports the paper vertically so that it stands out of the top of the unit, rather than in a series of drawers beneath. For thicker media a door can be opened at the front, providing a straight paper path. This option is also useful if you are intending to feed pages through more than once,
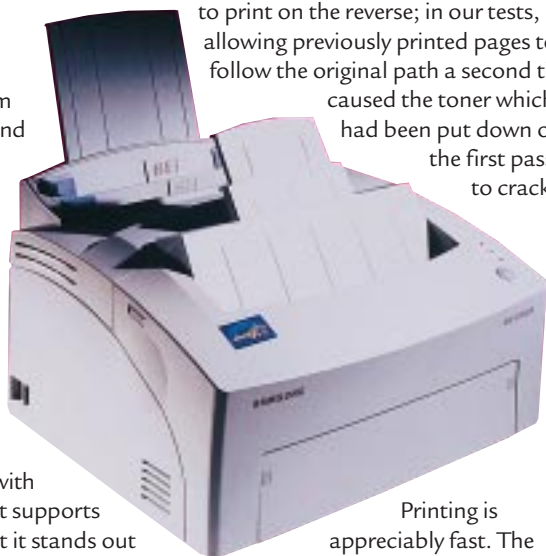
to print on the reverse; in our tests, allowing previously printed pages to follow the original path a second time caused the toner which had been put down on the first pass, to crack.

Printing is appreciably fast. The Samsung managed almost 6.5 pages per minute with 100 percent text coverage, so it will actually perform much faster than that when printing standard, less demanding business documents. The quality is very good,

too. Scoring 78 points out of a possible total of 108 in our tests, even very small characters were clear and easy to read. The versatile configuration dialogue makes good use of this ability, allowing the user to shrink pages down to fit more than one on a single sheet.

The ML-5100A is supplied with 4Mb of RAM installed as standard, upgradeable to 32Mb. Using the bundled toner cartridge you can output around 5,000 pages at five percent coverage before a replacement is required.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *£292.58 (£249 ex VAT)*
Contact *Samsung 0800 521652*
www.samsungelectronics.co.uk
Good Points *Quick. Inexpensive. USB connection option.*
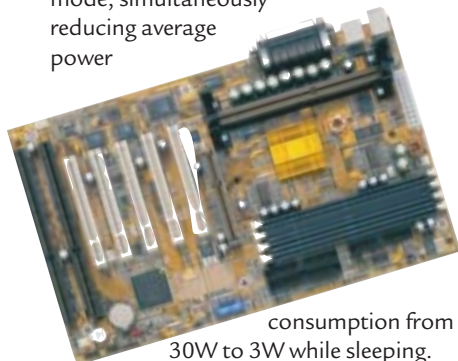**Bad Points** *Toner cracks quite easily.*
Conclusion *A good choice for the home or small office.*

GA-BX2000 (rev1)

This new motherboard from Upgrade Options features Suspend-to-RAM and rapid startup.

This is the first of a new breed of boards to feature Suspend-to-RAM (STR) and DualBIOS technology. STR has finally proved itself in notebooks: the last gasps of a dying battery save current settings to memory.

Recommended as part of Intel's 'Instantly Available PC' initiative, systems with STR provide rapid restart from sleep mode, simultaneously reducing average power consumption from 30W to 3W while sleeping. In order to function properly, ACPI

1.0-compliant components and an ACPI-enabled operating system, like Windows 98 or above, is required.

There are two BIOS chips to secure against primary BIOS failures, and minimal downtime as the backup BIOS re-instates the required information. The backup facility is entered immediately after power-up and a simple menu offers recovery or backup in seconds. Its functionality is not too dissimilar to having a bootable flash utility on a floppy disk, along with the backup.

The main advantage of having the hardware on-board is the automatic BIOS comparison that results in a checksum which would show even minor corruption that may not be detectable until some catastrophic failure occurs. At this point the recovery sequence comes into play and you're safe to continue using your workstation.

Other notable features include support for Intel's PII/III and Celeron processors; seven system bus settings; power-on by keyboard, mouse, LAN and modem; a flexible temperature sensor with a BIOS-controlled CPU duty cycle slow-down if it becomes too warm; case open detection; and four DIMM slots for up to 1Gb of system memory.

IAN ROBSON

PCW DETAILS

★★★

Price *£104.57 (£89 ex VAT)*
Contact *Upgrade Options 01252 331441*
www.gigabyte.com.tw
Good Points *Reassuring hardware security. Rapid system startup.*
Bad Points *Failure of one BIOS chip results in a loss of DualBIOS functionality.*
Conclusion *Restarting from suspend isn't quite the startup time of a PDA but it's a step in the right direction.*

Norton Utilities 4.0

RECOMMENDED
PERSONAL COMPUTER WORLD

Put the bounce back into your PC with the latest version of this trustworthy disk utility.

Peter Norton's suite of software utilities has been around since the year dot, it seems — and it's just reached its fourth Windows incarnation. If your PC is limping along, Norton Utilities 4.0 could be just the thing you need to put the life back into it: it has pretty much every software goodie and gizmo necessary to keep your machine in tip-top condition. In fact, once installed, you'll find over 20 from which to choose, and they're divided into categories to make it easier to locate the one you need.

There's a gaggle of tools designed to find and fix nagging problems. A prime example is WinDoctor. This nifty little application scans Windows for software errors, hardware configuration problems and shrapnel from supposedly uninstalled applications, and removes any offenders.

Disk Doctor keeps an eagle eye on your PC's hard disk, monitoring the surface for flaws and other potentially data-damaging hiccups. Along with Connection Doctor, which will attempt to iron out any difficulties with your internet setup, these features are part of System Check which can be run at will or on a scheduled basis. Those in the latter category are aimed at improving your computer's overall performance, whether that be the result of a sluggish hard disk or a processor which rarely seems to break into a sweat.

Speed Disk can be used to make your hard disk run faster by efficiently organising the data stored on it. If your hard disk is very fragmented this can take a while, but it's worth the wait. Programs launch faster, and you could even end up with a little more hard disk space at your disposal.

The Optimisation Wizard fine-tunes the Registry — the inner workings of Windows — while the Space Wizard identifies any files that might be unnecessarily occupying large chunks of your hard disk, offering you the choice of either moving, compressing or deleting them.

System Doctor keeps its electronic finger on your PC's digital pulse and
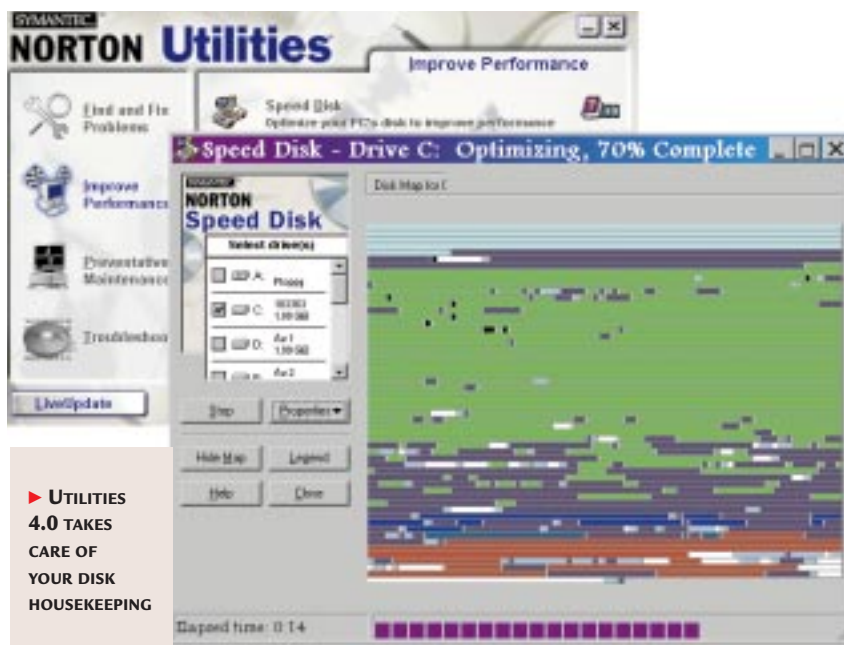
► **UTILITIES 4.0 TAKES CARE OF YOUR DISK HOUSEKEEPING**

monitors all your computer's vital signs, such as processor and memory usage. If it spots a problem, or thinks there's one lurking just around the corner, it will let you know in good time.

The Unerase Wizard provides you with the means to recover — or at least attempt to recover — any accidentally deleted or missing-in-action documents or files. It works well if you act quickly enough after the event, but don't expect it to resurrect files you erased three Windows re-installs ago. Also thrown in is CrashGuard which, as its name suggests, helps prevent data-loss when your PC or an individual application crashes, by giving you the chance to save your files. It's not entirely successful, although if you have it installed on an unstable PC it does make you feel more secure when you're working on that all-important document.

There's a comprehensive set of troubleshooting tools, too, including System Information, File Compare and Registry Editor. However, the last is really pitched at expert users — novices fiddle around with the Registry at their peril.

No discerning PC user should be without Norton Utilities

The suite as a whole is exceptionally easy to use, even considering the technical nature of some of the components. Help is in abundance and tutorials provide further guidance. And, as long as you have a net connection, the LiveUpdate feature will ensure that your Norton Utilities is kept up to date with improvements or modifications.

Once you've got Norton Utilities on your hard disk, you won't want to take it off. It has its quirks but they're few and far between and not enough to cause serious annoyance. While there's nothing particularly new or ground-breaking in version 4.0, if you don't already have an older incarnation, this one is well worth buying.

SCOTT COLVEY

PCW DETAILS

★★★★★

Price *£39 (£33.19 ex VAT)*
Contact *Symantec 0171 616 5600*
www.symantec.com/region/uk
System Specification *Windows 95/98, 486 processor, 8Mb RAM, 70Mb free hard-disk space, CD-ROM drive, 256-colour VGA monitor.*
Good Points *Extensive range of applications. Lots of user help and assistance.*
Bad Points *Nothing of note.*
Conclusion *No discerning PC user should be without Norton Utilities.*

Greater London Digital A - Z

Let us take you by the hand and lead you through the streets of London, on CD-ROM.

Residents, visitors and commuters have long known the value of the London A - Z street maps. The good news is that they're now available on this brand new CD-ROM, covering an area that stretches all the way to the M25, taking in Heathrow to the west and parts of Essex to the east. What this has over and above the paper-based maps is that it allows the user to quickly and easily locate streets, districts, stations, hospitals or places of interest. Enter the name of the place you're after, and the CD will display a list of hits containing your chosen phrase. Select the one you want, and the map will be redrawn to point at that location. It's great if you're a visitor or a tourist, or if you don't know the name of a particular street but you know something nearby. Each time a place is selected, it's added to a drop-down list for instant access at a later point, while forwards and back buttons allow the user to move through their map scrolls to retrace their steps. A 'home' location can also be specified. A - Z will then always open at this position to make it easy for users to navigate their local area.

NIK RAWLINSON
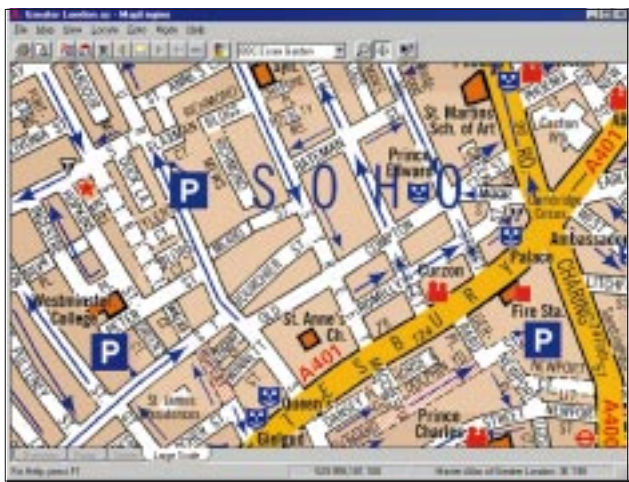
PCW DETAILS

★★★★

Price *£49 (£41.70 ex VAT)*
Contact *Geographers' A-Z Map Company 0171 440 9500 www.a-zmaps.co.uk*
System Specification *Windows 95/98/NT4, 10Mb free hard-disk space, 16Mb RAM, 4X CD-ROM drive, mouse, SVGA monitor.*
Good Points *Very fast. Easy to use. An improvement on the paper version.*
Bad Points *Not a route planner in the conventional sense of the word.*
Conclusion *A viable alternative to the already hugely successful map series.*

Startup Business Kit

Easy planning and presentation software to aid entrepreneurs, whatever your business.

The Startup Business Kit is a large box containing a single CD and nothing else, but that really is all you need. The kit's Business Plan section is broken down into eight parts; each section is further divided into a series of questions and answers that form the basis of the plan. On-screen context-sensitive help is available at all times, and the navigator ensures that information remains consistent throughout by allowing you to review previous questions using the First, Previous, Next and Last buttons.

The basic plan is written for you, with blue type in brackets where you fill in the details relative to your own company. It's easy for the more experienced entrepreneur to edit the plan and customise it to their own requirements, and yet simple and detailed enough for the newcomer to submit it to any financial institution almost word for word by merely filling in the relative details.

A comprehensive cashflow chart is supplied with formulae already entered and advice on how to enter your actual and budgeted figures. The instructions are very basic and should be clear to those unfamiliar with expenditure budgeting or even computer spreadsheets. The printed plan looks extremely professional, providing a separate page for the background and aims of the company through products and services, sales and marketing and finally the financial plan — certainly enough to satisfy even the most scrupulous bank manager.

SHEILA FRANKLIN

PCW DETAILS

★★★★★

Price *£29.99 (£25.52 ex VAT)*
Contact *Life Software 0181 875 4444 www.lifesoftware.co.uk*
System Specification *Windows 3.1 or above, 386 processor, 1Mb RAM, 1Mb free hard-disk space.*
Good Points *Easy to use. Economical.*
Bad Points *None worth mentioning.*
Conclusion *An extremely user friendly and comprehensive business startup package.*

X-Portal

Research the right way with this comprehensive reference tool that gives fast results.

A couple of bright ideas: internet search engines and CD-based reference works. One dazzling idea: combine the two. That's exactly what we have here — an extensive collection of 22 reference works and a built-in engine that, while submitting your query to the reference books, also sends it out to 34 online search tools ranging from AltaVista and Lycos to National Geographic and Health AtoZ. Adding a new engine is simply a matter of entering the address and showing X-Portal how to use it by entering a simple query and clicking on the Submit button. Entering a word or phrase in the input box and clicking Go submits it to each search engine, the reference books and the built-in atlas. Hovering the mouse over each one displays the

corresponding web address or reference title and a pull-quote of the specifically relevant part of the work. An icon beside each denotes its origin.

Using the mouse, users can zoom into and out of atlas locations, although the maps are fairly basic and zooming in does little to put a location in context.

For ease of use, installation adds an X-Portal button to your browser's toolbar.

Overall, the results X-Portal returns are fairly comprehensive. We were even able to find the home phone number of a friend that had been entered on a university web site.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *£49.95 (£42.51 ex VAT)*
Contact *POW Distribution 01202 716726*
www.pow-dist.co.uk
System Specification *Windows 95/98, Pentium 90, 24Mb RAM (32Mb recommended), 200Mb free hard-disk space, CD-ROM drive, 14.4Kbps modem for internet connection recommended.*
Good Points *Comprehensive results. Fast. Easy to use.*
Bad Points *Results seem to be returned in a random order.*
Conclusion *A vital research tool.*

Xara 3D 3

See your name in 3D rotating writing, in no time at all and customised for colour and font.

Creating 3D type and logos can be difficult even with expensive 3D modelling tools. Doing it on a budget, and at speed, can be close to impossible. Xara 3D 3 helps make that statement a lie. Within 10 seconds of installing the product, you'll be rotating your first 3D phrase, as you need do nothing more than enter the text you desire. That's it — all finished. As simple as that.

Of course, if you left it at that, your text would look the same as everything else produced in Xara 3D. For that reason the package also offers a wide variety of customisation options, including

font changes, colour alterations, and even the ability to reposition light sources to cast shadows in just the right direction. All bevels are customisable, whether rounded or flat, and user-generated images can be dropped in as either backgrounds or the texture of your characters.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *$39 if ordered over the net; £29 ex VAT if ordered by phone*
Contact *Xara 01442 350000*
www.xara.com
System Specification *Windows 95/98/NT, 8Mb RAM, 486 or better processor.*
Good Points *Easy and quick to use. Surprisingly powerful customisation options.*
Bad Points *Background textures are tiled by default when some users might like to stretch them instead.*
Conclusion *A first-class web design utility.*

Partition Commander *vs* Partition Magic 4.0

Optimise your **hard-disk usage** with these powerful but accessible partition manipulators.

VCommunications' Partition Commander and PowerQuest's PartitionMagic 4.0 attempt to make the benefits of hard-disk partitioning more accessible to the average user, through powerful graphical interfaces awash with hints and help. The approach of each, however, is quite different.

Partition Commander arrives on just two floppies and runs in DOS with a basic but clear GUI. You can opt for the Partition Wizard to guide you through the stages necessary to achieve your goals, or if you prefer a more hands-on approach, the automated wizard steps aside, giving you complete control.
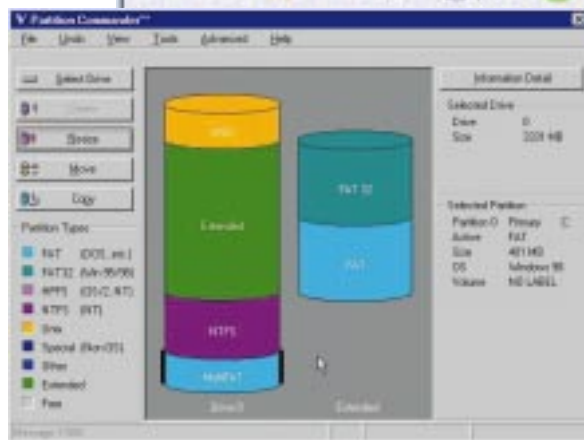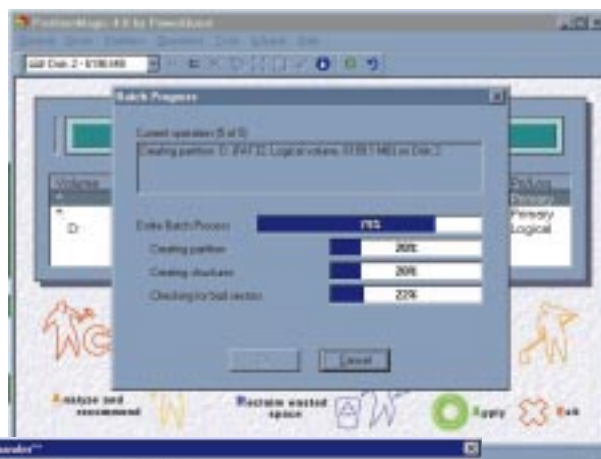
The selections presented to you are:
• more drive space;
• faster disk access;
• better organisation;
• add an operating system; and
• manual partitioning.

Advice is also available to assist you in making your choice. The first four selections take you through each stage, with summary explanations of what's occurring to put your mind at ease, but without a better understanding of what's happening, it's tempting to just let all the default selections go through. That said, two of the most potentially damaging actions, partition deleting and formatting, can be undone, and in the event of a power failure, a recovery diskette is supplied.

Those preferring a personal approach will relish the display, with its colour-coded file systems in proportional sizes and more detailed information on tap.

Partition Commander is a powerful tool that can achieve all it states, although it's not for the novice. As it's bundled with the Personal Edition of System Commander for running multiple operating systems, the price is enticing.

PartitionMagic 4.0 installs from an auto-running CD in Windows (although older operating systems will suffice) and provides an attractive GUI. As with Partition Commander you can opt for a Wizard to analyse your needs, or you can take control. This product aims to involve you as much or as little as you want, with basic instructions for reducing the time between your aims and your goals. But if you need help or some background information, the online manual is at hand.

Notable improvements over previous versions of PartitionMagic are the support for drives in excess of 20Gb, native Windows 95/98 and NT Workstation executables, and full support for Linux partitions.

Whereas Partition Commander applies your changes at the time they are selected, PartionMagic 4.0 emulates all your selections graphically first and then makes the changes only when you're happy with the overall configuration.

Partitioning does play havoc with your drive letters, and prior installed applications may make references to wrong or non-existent drives. This is where a 'drive mapper' utility comes into play, the inclusion of which is imperative to these applications. Both products have a perfectly functional version, but the fact that PartitionMagic is running from within your normal operating system makes decisions regarding re-mapping easier to check.

With BootMagic bundled for easy management of multiple operating systems, PartitionMagic is a complete, quality package.

IAN ROBSON

PCW DETAILS

Partition Commander

★★★★

Price £39.99 (£34.03 ex VAT)
Contact *MediaGold 0171 372 9733*
www.v-com.com
System Specification *DOS or Windows 95/98 required to install but not for use, 386 or greater processor, 1Mb free hard-disk space.*

PartitionMagic 4.0

★★★★★

Price £58.69 (£49.95 ex VAT);
£29.32 inc VAT for upgrade
Contact *POW! Distribution 01202 716726,*
www.pow-dist.co.uk
System Specification *DOS (5.0 or later) or Windows 3.x, 95, 98, NT, 486 DX or greater processor, 16Mb RAM (additional RAM required for FAT32 support or hard drives larger than 4Gb), 12Mb free hard-disk space (+8Mb for BootMagic).*

Internet economics
Which net deal is best for you?

Why pay for something when you can have it for nothing? That is the question which many internet users have been asking themselves lately, along with the arrival first of FreeServe and then a rush of other free service providers. With the two largest tabloid newspapers also joining the fray, you could be forgiven for thinking that the writing is on the wall for subscription-based internet service providers (ISPs).

But are things that simple? Will a free service give you everything you need, leaving you just to pick up the phone bill? Or are there catches and snags that mean they might not be all they're cracked up to be. As ever, the truth lies somewhere in between. There are more options available than just a paid-for account or a free one and the right one for you depends on exactly what you want to do and how much you're prepared to spend.

There are four options that many people might want to consider: a free service provider, a subscription-based provider, a permanent link to the net from your home or office, and co-location where a computer you own sits in a service provider's machine room. To many people, these last two might seem a bit extravagant but, as we will see, they can be surprisingly economical in certain circumstances.

■ Home users
For the more casual user of the internet, it's obvious that the choice is really only between the first of the two options mentioned above: that is, either paid-for, or free dialup access.

When the free internet services first appeared, in 1998, it was a pretty straightforward choice: you paid for access, or you put up with advertisements being displayed while you were online, and fewer facilities than you might expect from a subscription service. In

some cases, that even meant no access to email using services such as POP3, forcing you to stay online and read messages using a web browser.

However, the launch of FreeServe last September made quite a difference to the way free services were viewed. With free web space, unlimited email addresses and no subscription fee, the package on offer actually has more features than some of the smaller, paid-for providers.

There is one important difference, though — the technical support. While FreeServe's initial one-pound-a-minute has now been halved, it's still rather more than the local or national call rates you'd have to pay when you need help from a subscription provider. For an

experienced user, that might not be so much of a problem but for a new user the costs could soon mount up. Of course, there is free support via email and you can look up the solutions to common problems on the web, but that's not a lot of use when you can't even manage to get connected to the net in the first place.

Another important factor to bear in mind with free internet services is how they're funded. Almost all of the services rely on phone companies other than BT to provide the dialup lines that you must call to get online, and BT passes on most of the call income to the other phone company which splits it with the ISP. What this means is that the longer

you stay online, the more income the ISP receives. In consequence, the more cynical reader might consider that there will not be the pressure to upgrade connections to the rest of the net, or invest in other new equipment to speed the service that would be present in other ISPs.

However, it is really too early in the life of the free services — which themselves have been taken aback by the runaway success of the likes of FreeServe — to make any judgement, but certainly some users have reported problems gaining access to services at peak times.

■ Optional extras

While, on the face of it, the services offered by free providers may seem to be all you'll need, for some there are positive benefits to paying for a subscription and it's worth reviewing the options before taking the plunge and signing up. Not only are there issues such as how many email addresses you can have, or the amount of web space, but what other services might you need?

One of the ways in which a free internet service keeps its costs down is by offering everyone the same service. So if you want, say, a fixed IP address which would allow you to run various servers on your own computer, you're unlikely to find it in the free market. But take the paid options and you can have it as standard with a Demon account, or offered as an option with other providers such as Direct Connection.

Do you want to dial up using dual-channel ISDN for a faster connection?

Again, you're likely to have to pay for this, although many subscription services no longer charge you more than the standard fee.

What about FrontPage extensions for web designers? Or RealAudio from your web pages? Or, perhaps, the comfort of simply knowing that there is someone on the end of the line so you can call them at any time of day, without worrying about the cost.

These are generalisations, of course — even some of the paid-for services don't offer all those facilities. But it remains

There are more options available than just a paid-for account or a free one

true that if you want more than just net access, a subscription provider is more likely to be able to offer you the extra services you require.

■ Call charges

There is another factor to bear in mind. How often will you be using the internet? Whether you are using a free or a paid-for service, there is something you cannot escape, and that is phone bills. Ultimately, they are likely to dwarf any subscription charge that you pay, although some of the paid-for internet services are now doing special deals which offer a potential for saving on your phone bill, and these could be quite significant.

For instance, if you use the net a lot during the day it will only take around 13 hours a month for ClaraNet's ClaraCall

option to start saving you money over a free internet service, even taking into account the monthly subscription.

Daytime users are the most likely to end up with crippling phone bills, although home users can manage if they spend a lot of time online, especially those who play lots of internet games, or use chat facilities extensively.

You may think that a permanent link to the net is the province only of the wealthy but it's possible to have a fixed link for around £500 per month. For that sort of money, you'll have a 64K line — the same speed as ISDN — but it will be connected 24-hours a day and you can link up a whole network.

The exact economics depend on what you want to do, but if you're going to be online for the whole of the peak calling period, or much of it, then it could prove to be economical.

Outside those hours, it is far less likely to break even. But home workers may find that it's worth it for a small extra cost, knowing that they have permanent access and a fixed monthly fee. Bear in mind, too, that many short calls will run up an even bigger bill, as you'll pay the minimum charge for each one.

Also, do not forget that if you have a fixed line, you can run a web server of your own. Yes, you will not have the bandwidth that might be available on web pages hosted at an internet service provider, but as long as you are not offering massive files for people to download, you can run a web server on the end of a 64K line.

Connection	Typical cost	Technical support	Facilities	Pros	Cons	Recommended for
Free internet account	Nil.	50 pence per minute.	Email. Web space.	No subscription charges.	May not be able to use web space for commercial purposes. Support can be costly.	Casual user, with moderate usage.
Subscription internet account	£12 per month.	Included.	Email. Web space.	Usually provides more flexible options than a free account. You may be able to achieve better discounts on phone calls.	Limits may be placed on web space access and scripting.	Heavier users and those who want more specialised options.
Leased line	From about £500 per month for a 64k link.	Included.	Full access for your network. You can run your own servers.	Maximum flexibility and fixed monthly charges.	Expensive. You'll also need to buy a router, and configure your own servers. Fast links are very pricey.	Small businesses with heavy usage, or people requiring greater flexibility.
Co-location	From about £300 per month.	Included.	Complete control over your server's configuration.	Allows for very complex servers and unlimited web space. Fast access for site visitors.	Additional charges may be levied for traffic above a certain level.	Those requiring fast web serving with a high degree of customisation.

Other solutions

While the four solutions we have mentioned here are some of the most common, there are lots of other things coming along, including new technologies which are not yet widely available.

One solution for some offices may be network ISDN dialup — essentially the speed and facilities of a 64K leased line, but on demand.

With subscription charges of around £100 per month, plus the cost of the ISDN line coming in at about £30, around seven hours of online time a day is the break-even point for a leased line.

Further into the future, cable modems and ADSL promise much faster speeds than we are used to at present. However, net users should not expect nirvana.

Cable modems, which may appear later this year, offer high-speed connections, but it's shared bandwidth so the more users on your street, the more you will be fighting for a share of the same pipe.

ADSL, which is likely to appear next year, also promises faster downloads, although uploads — while being faster than with a modem — are not going to be anywhere near as quick.

If you expect either of these to be an alternative to a leased line, think again. It is likely that, at least for low price solutions, users will find that they cannot easily run servers, if at all. That may not bother some people, but those who expect the equivalent of a fast leased line for around £50 a month may be disappointed. It's probably unrealistic, though, to expect phone companies to be willing to kill off their leased line business at a stroke by allowing unlimited use of cable and ADSL systems.

■ **Web space**

It is in the area of web space, and what you might want to do with it, that the different solutions for connecting really start to come into play. Shop around between different free accounts and subscription services and you will find a variety of different options, including various amounts of free space, and a range of restrictions as to what you can do with it.

Some providers will let you put anything legal in your free space. Others will restrict you to non-commercial activities, ruling out any use by a small business. You might find, too, that some people offer a rather unattractive web address such as www.somewhere.co.uk/~user, while others provide you with a virtual host name.

Often, though, the biggest fly in the ointment is bandwidth. Different people handle this in different ways but at worst you could find that a popular site ends up being suspended for going over its allowed quota of transfers.

If you are relying on people being able to access your web site you are really going to have to pay to have it hosted, and that probably won't come cheap, especially if you have a lot of large files. But most likely it will also give you the option of running scripts and having a proper domain name. However, add the cost of web hosting to the call charges you are paying, and a fixed link to the net might seem more attractive. Although some might advise against it, it is perfectly possible to serve 10Gb of web data in a month down a 64k line.

■ **Co-location**

If your site is very popular, or has lots of big files, people will suffer from slow downloads. In that case, there is the solution of 'co-location'. An increasing number of ISPs will let you put a computer of your own in their machine room, connected to their network, so that people can download files from your web site far more quickly than if you had a 64k line. And, since the server is yours, you can run whatever scripts you want on it.

Beware, though, of the quota cropping up. You will usually pay a fixed price for a certain amount of data each month, but any more than that and you will run up a bill for the extra but it still provides a good compromise between the cost of web space on an ISP server and the flexibility of running your own system.

■ **Making the choice**

Making the right choice depends on what you want to use the net for, and on how much you want to spend. It is not always a clear cut choice since the cost of hardware will differ, and in the case of dialup access the great unknown is the phone bill landing on your door mat.

☛ **For casual surfers,** it is hard to deny that a free internet service can represent good value for money. However, if you are intending to spend more than a couple of hours connected to the net each day, you may find that some of the paid-for services will work out cheaper, especially if they include, like ClaraNet, a discount on some of the telephone calls.

☛ **The home worker or small business** is more likely to find a leased line connection to be an attractive prospect, especially if they are already paying for a lot of web space to be hosted, which could be done on a computer in their own room. And, in the case of an office which accommodates more than one user with a modem on their computer, the firm is likely to find it easier to break even, or even reduce costs, by hooking up 24-hours a day.

☛ **If serving web pages efficiently** is the name of your game, and you are looking for the flexibility to do whatever you like in terms of scripting, or linking live databases to the worldwide web, then it could well be worth considering the co-location option.

But whatever solution you choose, you should remember to check the small print and find out what you will be paying for — or what you will be getting free of charge. There can be limits and restrictions in all types of contract, whether or not it is costing you real money. So, there are times when it really is prudent to look a gift horse in the mouth.

NIGEL WHITFIELD

Shop around between different free accounts and subscription services for a variety of options