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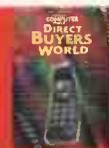
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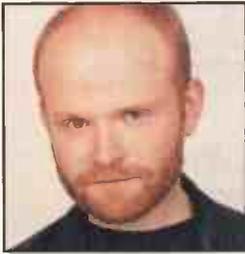
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The new Intel chip is **so fast**, they didn't have time to think of a name.

# The chip with no name

**So here it is, half a gigahertz** – that's 500MHz to you in real money, and enough of a big deal for Intel to dream up an original name for its brand new chip. I'd like to say that Intel has finally decided to employ one of its groovy-sounding processor codenames for general consumption, but as you can see from our cover and the inevitable avalanche of advertising, I'm afraid it has instead opted for the slightly uninspiring badge of Pentium *III*. Okay, it may be written in italicised roman numerals, but I reckon the public would be more than happy to invest in a Katmai, or the Mendocino, Deschutes or Klamath codenames which preceded it. Either way, a new processor from Intel is big news, so we've brought you the details of the chip and reviews of the first PCs to house it. Check out our results to see if a whole raft of new instructions are enough to persuade you to upgrade. Speaking of upgrading, the Katmai – sorry, Pentium *III* – is not our sole PC group test this month. Alongside the fastest PCs to grace our labs, we've tested

I reckon the public would be **MORE THAN HAPPY TO INVEST** in a Katmai, or the Mendocino, Deschutes or Klamath codenames

ten mid-range workhorses which will set you back the more than reasonable sum of £999 inc VAT. The upgradeable part came in when we asked the manufacturers to submit

systems which could stand the test of time; PCs which have plenty of room and opportunity to expand and upgrade in the future.

**But it's no good having a super-fast** or ultimately upgradeable PC if it's giving you a headache. I'm referring to my favourite subject of displays, perhaps one of the most neglected areas of modern PCs. Admittedly the situation is much better than it was a couple of years ago, but there are still plenty of systems in operation with poor or badly set up monitors. Before you splash out on a punchier processor, more memory or a larger hard disk, why not consider perhaps the single greatest PC productivity enhancer, by treating yourself to a new monitor. Kiss your flickery display goodbye and welcome rock-steady, geometrically precise images. The cost? Cheaper than you think, and that includes the latest 19in flatscreen CRTs or waif-like TFT panels.

**Also in this packed issue** we've got the first of a ten-part countdown to the Year 2000, a group test of Java and visual programming tools, a report on IT training for your small business, and we find out whether Digital TV really is ready for public consumption. Reviews this month include the latest super-fast Silicon Graphics NT Workstation, the first colour palm CE handheld, and an in-depth look at the new Sega Dreamcast. This next-generation games console has made it into our sweaty palms almost one year before its anticipated release in the UK. When you consider it houses the latest NEC Power VR 3D graphics chipset, runs Windows CE and thrashes high-end PCs at games, with a price tag of around £150, we thought it well worth a look. Before I return for another go, turn to page 66 for details on how to take part in our biggest ISP speed survey to date – let's find out the truth about getting on-line.

Gordon Laing, Editor

Won't Mom be  
**SURPRISED**

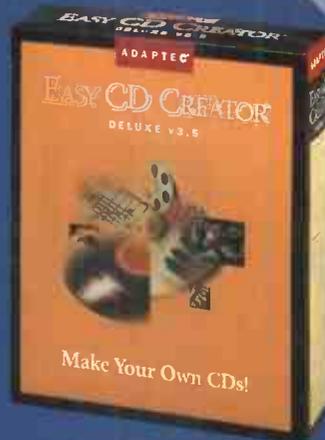


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For a full list of their product range, a list of other manufacturers distributing Windows 2000 Ready PCs and a free Windows 2000 Ready CD, please visit our website at: [www.microsoft.com/uk/windows2000/](http://www.microsoft.com/uk/windows2000/) or call **0345 00 1000** quoting **Windows 2000 Ready** For Ireland please call **(01) 450 2113**

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Microsoft Windows NT Workstation 4.0 is now available with Service Pack 4, which includes Y2K and Euro updates. Windows 2000 Ready machines do not include Microsoft Windows 2000, which will have to be purchased separately upon future release. For Year 2000 information regarding Microsoft products see [www.microsoft.com/uk/year2000/](http://www.microsoft.com/uk/year2000/)  
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WELCOME TO THE **APRIL 1999** PERSONAL COMPUTER WORLD CD-ROM

# April COVER DISC

- GAMES APPLICATIONS LIBRARY ENTERTAINMENT INTERNET

**Need to organise your office?** We've got a FULL VERSION of SuperOffice Professional for Networks on this month's disc. And if your favourite OS flavour is UNIX, the FULL VERSION of Corel WordPerfect 8 for LINUX is also here. If that isn't enough, there are nearly 5000 animated GIFs and 10 web templates for you to use absolutely free. You might even win a Hi-Grade Mi-4000 notebook worth £1099 by completing the electronic version of the PCW Reader Survey from CD Online. So check it out and then you can tell us what you think!

## SuperOffice Pro for Networks 4.0



**This product requires the following serial code: 1410031619**  
**SuperOffice Professional for Networks 4.0** is a must for any

individual or office with information, reports, notes or memos scattered across computers, filing cabinets or sitting on various desks. Using a shared database, users can access their information in an orderly fashion, thereby increasing accuracy and efficiency.

- **SuperOffice sorts data** into seven databases relating to major areas:
  - information about important companies and contacts
  - day-planner and to-do list
  - planned and completed activities
  - customisable letters, faxes, emails and proposals

- projected and actual sales opportunities
- storing and tracking sales opportunities
- reports, mailing lists and labels
- **New features** in version 4.0 include a Monthly Calendar View, Activities linked to a Project, Cross-platform Compatibility, Segmenting the SuperOffice Database and Regional Office Support.
- **This software will function fully for thirty days.** After this time, *Personal Computer World* readers must apply to the SuperOffice Sales office (using the supplied fax form on the CD) to obtain a key that will activate the application as a full three network user version, free.

### PCW DETAILS

**Platform** Windows 3.1 or higher  
**Limitation** Fully functional standalone or three-user network  
**Sales Contact** 01895 820280  
**Technical Support** 01895 820280

The licence for this software is only valid in the UK and Eire. Tutorials and registration documentation can be found in Word 97 and RTF format on the CD.

## Technical information to help you use the CD

- ✓ **System Requirements**  
You will need a PC running Windows 3.1 or Windows 95. The disc will run under Windows NT but functionality may be reduced. Please check individual products for specific system requirements. For best results, run the CD on a Pentium PC with at least 16Mb of memory.
- ✓ **How to use the CD-ROM**  
Put the disc into your CD drive.  
**Win95** – If you've got Windows 95, the PCW interactive loader will appear on your screen. If your CD doesn't autoload, go to Start/Run and type in <CD Drive>:\pcw.exe

- Win 3.1** – From Windows Program Manager choose File/Run, then type in <CD Drive>:\pcw.exe and press enter.
- ✓ **Faulty Discs**  
If you get messages like 'Cannot read from drive D:', or your drive continually scans the disc without starting, you may have a faulty disc. In this event, please return the disc with a covering note, detailing your name and address, and clearly marked 'PCW CD APRIL 1999', to:  
TIB plc  
HelpLine Returns  
Unit 5  
Triangle Business Park  
Pentrebach  
Merthyr Tydfil  
Mid Glamorgan CF48 4YB

- A replacement disc will be sent to you by post. Please use this address, as replacement discs cannot be supplied direct from the VNU offices.
- ✓ **Technical Support**  
If you have technical problems with individual products, please check in the magazine, or on the CD, for the manufacturer's support contact details. For general problems with the CD, the Technical Helpline is open weekdays from 10:30am to 12:30pm and 1.30pm to 4:30pm, on 01685 354726. A live technical info page is also available through CD Online direct from the CD (see internet pages in

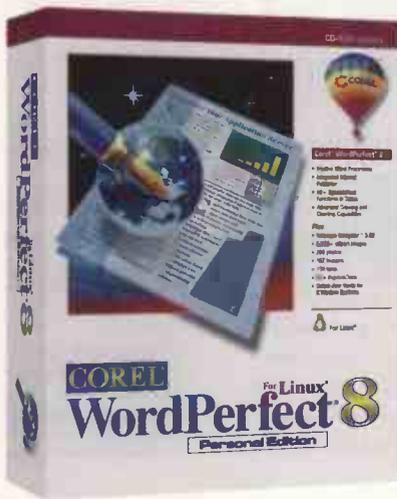
- these CD notes). Please see 'Faulty Discs' for replacement disc information.
- ✓ **Getting software onto our CD**  
Personal Computer World is keen to promote quality software and would like to hear from you if you are interested in having your product included on a future cover disc. For cover-mount enquiries, please telephone Afshan Nasim on 0171 316 9592 or email [afshan\\_nasim@vnu.co.uk](mailto:afshan_nasim@vnu.co.uk).
- Phone Afshan Nasim on 0171 316 9592 or email [afshan\\_nasim@vnu.co.uk](mailto:afshan_nasim@vnu.co.uk)

### IMPORTANT NOTICE

These products are for personal use only on one PC at a time. You may not rent, lease, assign, re-sell or otherwise transfer the rights to anyone for any product contained on this CD, or use any product for public performance. Neither the suppliers nor the publisher shall accept responsibility for any losses or damage resulting from use of this software, including any loss of profit, damage to equipment, interruption of business or data or any other damage either direct or accidental. It is recommended that you back up any programs and data on your hard disk before installing any software. Please read installation and system requirement instructions carefully before using.  
The publisher, VNU, has checked the Personal Computer World CD-ROM for known viruses at all stages of production, but cannot accept liability for damage caused either to your data or your computer system, which may occur while using either the disc or any software contained on it. If you do not agree with these conditions, you should not use the disc. It is good practice to run a virus checker on any new software before running it on your computer, and also to make regular backup copies of all your important data.  
Unless otherwise stated all software contained on the CD is for demonstration only. This means it may be restricted in some way: for example, it may be time limited or have certain functions disabled.

## Corel WordPerfect 8 for Linux, Personal Ed.

**Note: This software will work ONLY on Intel x86 computers with the Linux Operating System, and X-Windows. It cannot be installed directly from the PCW interface, which will only copy the compressed file from the CD to a destination of your choice. See text, right, for full installation instructions.**



As Linux continues to make inroads into the computer mainstream, Corel Corporation has introduced WordPerfect 8 for Linux. With the same word processing capabilities as the Windows version, there are also many features available only for Linux, like hardware support for over a thousand printers, conversion of web files directly into Corel WordPerfect format, and a built-in file manager that allows users to access files, create directories and change file modes without having to remember Linux commands. It uses the same file format as WordPerfect for Windows 95/NT/3.1 and Unix, letting users manage around 40 different file formats, including Microsoft Word 97 files.

The version on the CD includes only the application and is fully functional for ninety days. In order to continue using the product completely free, beyond the initial evaluation period, PERSONAL USE users are required to register at [livewire.corel.com/wp8LinuxReg/register.html](http://livewire.corel.com/wp8LinuxReg/register.html)

To install the product on a LINUX machine, users should do the following:

- Insert the CD into the drive
- Copy the file into a separate directory on your system. The file can be found at: <CD drive>:\SOFTWARE\FEATURED\APPLIC\LINUXWP8\GUILG00.GZ
- Once the file has been copied, perform the following operation:  
`gunzip guilg00.gz ; tar -xvf guilg00`
- After this, type `./Runme` to start the install program.

If possible, run the install from a terminal window, from within X Windows, because the X-based install is a more familiar interface (this is not a required step, however).

**Minimum requirements:**  
Linux OS,  
9Mb RAM.  
Installation information contributed by supplier.

### PCW DETAILS

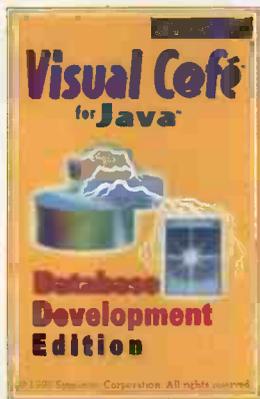
**Platform** Linux  
**Limitations** Fully functional. Registration required after ninety days.  
**Sales Contact** 01703 814142  
**Technical Support** FAQs posted to [linux.corel.com](http://linux.corel.com)

## Visual Café 2.5 & Visual Age for Java 2.0

In association with the Visual Programming group test in this month's issue [p198], we bring you evaluation versions of two of the featured packages for the Java platform:

### Visual Café for Java 2.5

Visual Café 2.5 from Symantec is an easy-to-use Rapid Application Development (RAD) Java Integrated Development Environment (IDE) featuring an editor, debugger and compiler as well as an extensive array of wizards. Symantec's code helper is also included, plus a Java Beans component library with source code.



### PCW DETAILS

**Platform** Windows 95/98 and NT  
**Limitations** 30-day trial  
**Sales Contact** 0171 616 5600  
**Technical Support** 0171 616 5809 (Mon-Fri 9am-5pm)

The supplied compilers in Visual Café create not only conventional applets and applications, but also standalone Windows

Visual Age for Java  
Entry Edition 2.0



executables. User-friendly and easy to learn, other features include JFC/Swing support, the latest Java

debugging tools and fast application performance.

### Visual Age for Java 2.0

IBM's VisualAge for Java is a Java application development environment for building Java applications, applets, servlets and Java Beans components. The developer productivity, ease of use and powerful features offered by version 1.0 are here, but there's a new High Performance

Compiler, connections to more enterprise systems, team programming support and exploitation of the very latest in Java technology.

- **Features include:**
- Support for JDK 1.1.6 and Swing 1.0.2

- IDE with visual programming support for creating Java applets and swing beans
- Support for object serialisation
- Import GUIs built in other Java development environments
- Java Beans for easy access to data
- Tool Integrator APIs for extending VisualAge for Java
- Domino agents in the IDE
- HTML documentation with advanced search capabilities

### PCW DETAILS

**Platform** Windows 95 and NT 4.0  
**Limitations** Entry Edition supports a maximum of 500 classes  
**Sales Contact** 01329 242728  
**Technical Support** None

CD-ROM

HELPLINE

01685 354762

## LapLink Professional

**LapLink Professional** offers powerful remote comms and internet solutions to computer professionals, with access to information on their office computers anytime, from anywhere. Solving such problems as the need to share data between the user's home or portable PC and the PC in the office, it also offers the ability to run office-based applications at home or while travelling. LapLink Professional now offers better images by utilising performance-enhancing options and advanced GDI-based graphics. Large bitmaps can be filtered out, and the Active Desktop in Win 98



### PCW DETAILS

**Platform**  
Windows 95/98 and NT 4.0  
**Limitations** 30-day evaluation  
**Sales Contact**  
0800 374849  
**Technical Support**  
01344 867300  
(9am-5pm Mon-Fri)

can be optimised so that data transmission is improved. LapLink Professional also caches icons and bitmaps between remote control sessions, so the more it is used, the faster it works. The Streamlined LinkBar puts you just one click away from connecting, and support for USB cable means users can transfer files up to five times faster than with parallel cable and seven times faster than with serial cable.

## Taxi

**Taxi Interactive** is a personal shopping assistant for the internet, exploiting eCommerce and giving convenient access to some of the best online stores. You may be confused by all the different methods of purchasing from the web, but Taxi sets out to make it simple by allowing you to place credit card and delivery information in one secure and trusted place. Also, Taxi does not collect personal contact information for other use, so avoiding unwanted email from vendors.

All you have to do with Taxi is select and click, and the transaction is done! With 'InstaBuy', you need only enter your credit card and shipping information once. Then buy anywhere InstaBuy is accepted, without having to re-enter the information each and every time. TAXI also offers a unique shopping comparison guide to



help you find the best product at the best price. The interface can be personalised to individual interests by entering details during the original configuration. Taxi then continues to watch and remember your shopping patterns and interests.

### PCW DETAILS

**Platform**  
Windows 95 and NT 4.0  
**Limitations** None  
**Sales Contact**  
[www.mytaxi.co.uk](http://www.mytaxi.co.uk)  
**Technical Support**  
[support@mytaxi.co.uk](mailto:support@mytaxi.co.uk)

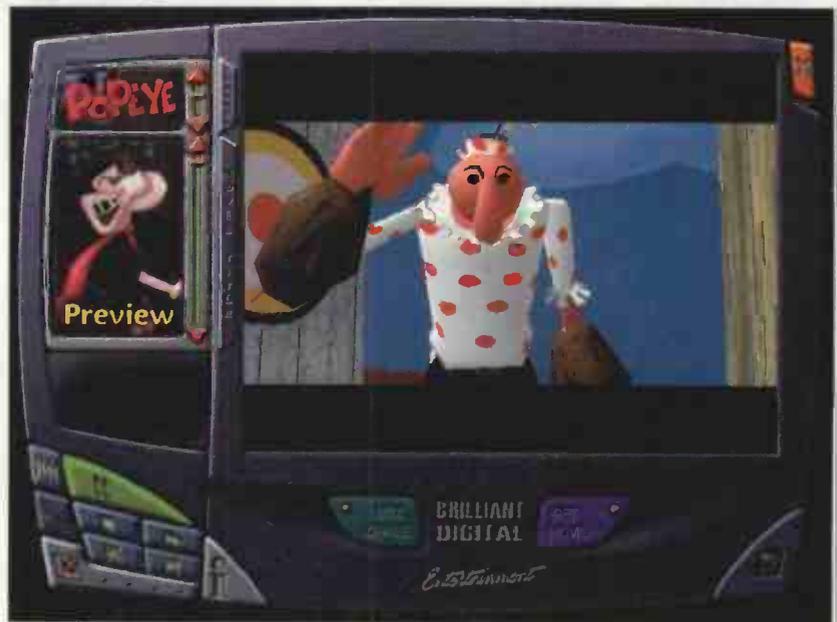
## MultiPath Movies Digital Projector

**MultiPath Movies**, from Brilliant Digital Entertainment, are a new hybrid of video game and video movie which allow you to watch a story unfold in 3D animation, and to interact with the action along the way. The online library includes adventures from Xena — Warrior Princess, Ace Ventura, Superman, Popeye and original titles. This month's CD contains a special copy of the Digital Player required to watch the movies, and includes watchable previews of an adventure with Ace Ventura and fun with cartoon classic, Popeye. Other previews are available from the Box Office at the Brilliant Digital web site. To buy the full movie, just click on Get Movie while viewing any of the previews, to launch your browser. This will take you to the order web page. You will be asked to set up an account by supplying

### PCW DETAILS

**Platform**  
Windows 95  
**Limitations** Fully working player with watchable preview movies  
**Sales Contact**  
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**Technical Support**  
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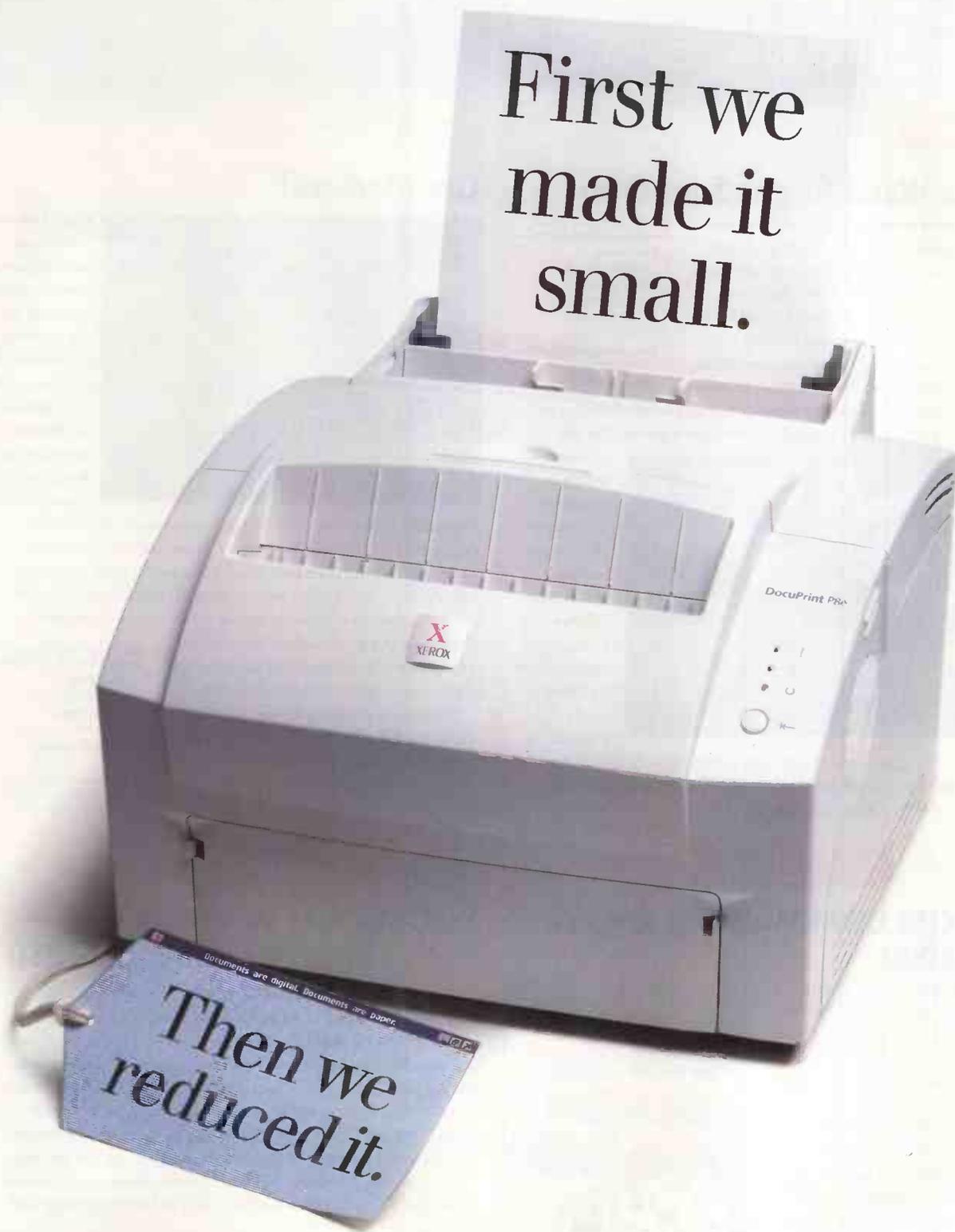
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Movies are compact and relatively quick to download. If you already have the

preview movie inside the Player (as above) only the key files that open the full movie are downloaded — these are very small. If you already have the player that was on last month's CD installed, the new previews will be added to the existing installation.



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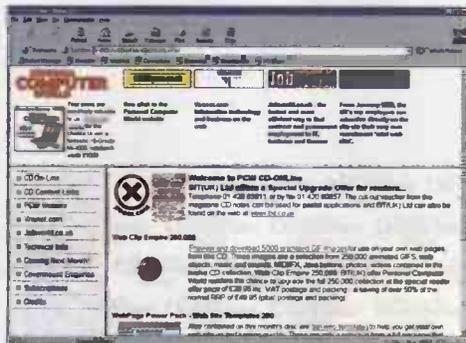
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## PCW CD OnLine



CD Online offers an extension to the normal content contained on the disc by taking you directly to the online web sites of the companies featured. Find out more about the products and about the company itself. You could even send them an email and talk to them direct. If you're connected to the internet, you can visit these sites via the Content Links of the CD Online section.

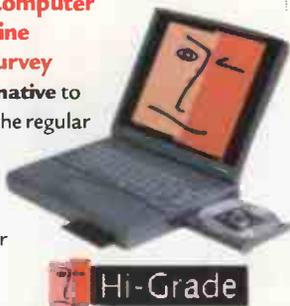
In addition to the links, you can access the Personal Computer World, [vnunet.com](http://vnunet.com) and [jobworld.co.uk](http://jobworld.co.uk) web sites, and there is even a sneak preview of what will be on next month's disk!

To access CD Online, click on the banner at the top of the main screen. This will automatically start your browser and open the main menu. If you don't already have a browser installed, you can install the latest versions of Internet Explorer or Netscape straight from the disc.

If you've enjoyed the magazine and the CD, you can subscribe via email while you're online! If you have any other comments to make about the CD, please feel free to email us at [PCW\\_CD@VNU.CO.UK](mailto:PCW_CD@VNU.CO.UK).

### Personal Computer World Online Readers Survey

As an alternative to completing the regular survey in the magazine, this month you can enter your views through an



online version on this month's CD. From the main CD screen, or from the main screen of CD Online, you can access the survey form using your browser. This form is stored on the CD so you don't have to be online to complete the form. However, you will need to connect to send the form at the end. Only complete this electronic version of the survey if you CAN connect to the internet without restarting your browser. The survey is also available in an online version at the Personal Computer World web site at [PCW.CO.UK](http://PCW.CO.UK).

When you complete and return this survey, your details will be entered into a prize draw to win a fantastic Hi-Grade Mi-4000 notebook worth £1099. Fast, efficient and fully equipped with Intel Pentium II processing power, Hi-Grade's Mi-4000 brings users highly portable multimedia versatility.

Please complete the survey as fully as you can, thereby helping us to constantly publish a magazine that meets your needs and requirements.

Note: The Prize Draw closes on 1st April 1999 — so fill in the questionnaire now.

## AOL 4.0i GOLD

AOL 4.0i GOLD has improved navigation and many new features. With one-step web access, simply enter the web address/URL in the input box on the toolbar, click on the forward button, and you're there! The new, fully customisable toolbar allows you to go directly to web sites and to any AOL area. Emails can contain pictures and images in the text of the messages, and you can customise them with a personal letterhead, font, colours and typestyle.

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- Free 5 email addresses!
- Free Technical support!
- Free 10Mb web space!

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- 100% local access
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### PCW DETAILS

Platform  
Windows 3.1 and 95  
Limitations One month free membership.  
Sales Contact  
0800 376 5432  
Technical Support  
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CD-ROM HELPLINE 01274 736990



## The world's fastest colour inkjet also

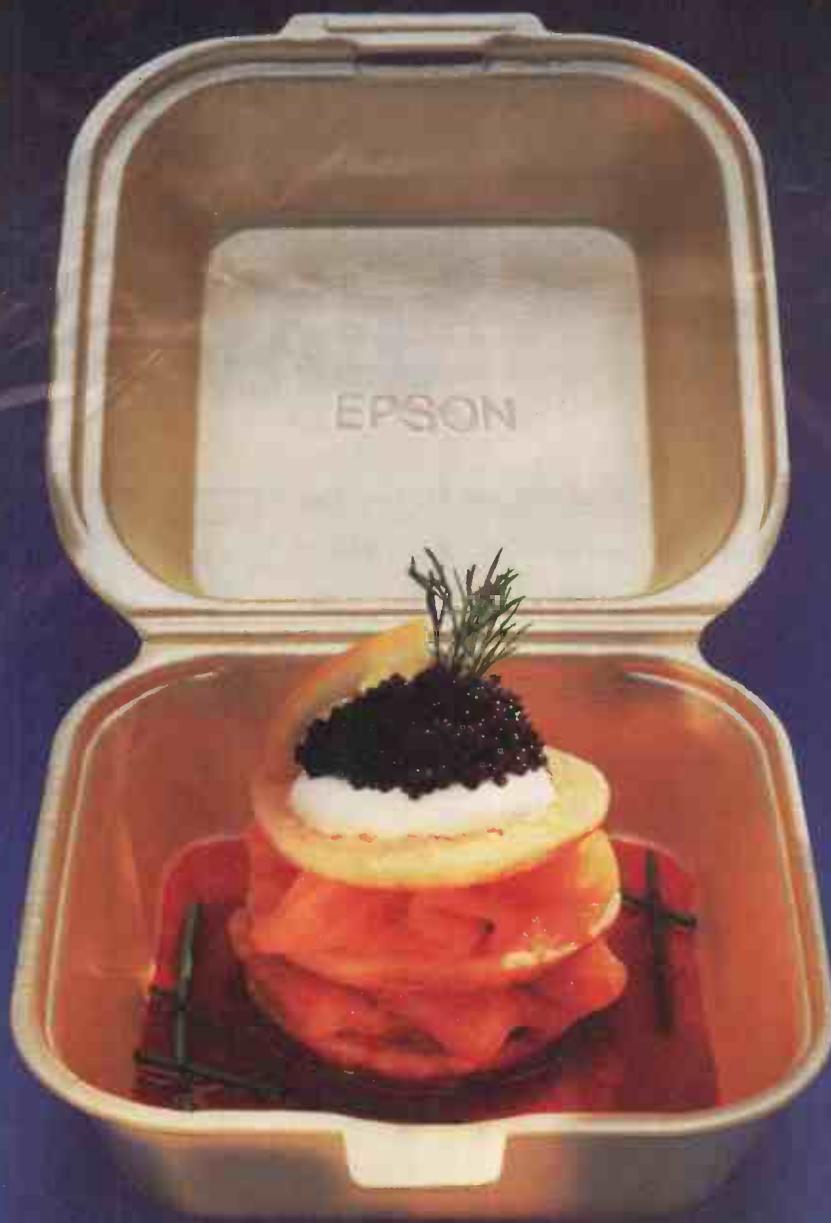


Food for thought. Not only does the new **EPSON Stylus Color 900** inkjet beat all its rivals for quality, it beats them for speed. EPSON have pioneered Variable-Sized-Droplet Technology which actually increases print speed. Using different sized dots on the same page and line, the printer can create incredible detail with small dots while covering simple areas quickly with larger ones. It's all made possible by the unique

1440dpi EPSON Micro Piezo Crystal Printhead. Having created the world's smallest dot, EPSON have just made it even smaller. Our Ultra MicroDot is less than half the width of

**EPSON. THERE'S NO COMPARISON.**

**EPSON®**



**gives you the world's finest quality.**



the average human hair and invisible to the naked eye. It's these tiny dots that give you the crisp, razor sharp detail.

It's not often that the world's fastest is also the world's finest. The **EPSON Stylus Color 900** four colour inkjet gives you the best of both worlds. A fact that our competitors may find hard to swallow. The EPSON Stylus Color 900 is available for around £369. We also have a network

ready version, the **EPSON Stylus Color 900N**, with built-in Ethernet interface.

For a print sample and more information on the EPSON colour inkjet range call **0800 220 546**, fax **01442 227 271** or visit [www.epson.co.uk](http://www.epson.co.uk)

**EPSON. THERE'S NO COMPARISON.**

**EPSON<sup>®</sup>**

# Buying a cheap PC

## Just ask the

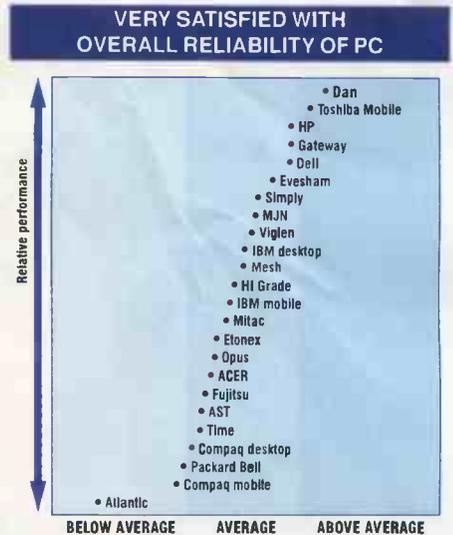
**C**heap PCs can look so tempting. But when things go wrong, they start to look a lot more expensive.

Can you afford to take that risk?

Poor quality parts. Bad advice. Non-existent after-sales service. They all come cheap. Thankfully, Dan customers don't want cheap PCs — they demand great value for money. That's why we've topped the customer satisfaction polls time and again in leading computer magazines such as Personal Computer World, PC Magazine, PC Direct,

What PC? and PC Pro. The Service and Reliability Survey in PC Magazine, for example, has revealed virtually every year that Dan customers are more likely to stay with the same PC vendor than owners of any other brand. Respondents to Personal Computer World's 1998 Reliability Survey said they prefer to stick with Dan too.

At a time when PCs are so crucial to our working lives, doesn't it make sense to look beyond the price tag? The



professionals who read computer magazines clearly think so. All the polls



### dantum 2 WS

High-end Workstation



- Choice of Intel® **Celeron** or **Pentium®II Processor** (single or dual) with Cache
- 128MB PC100 SDRAM
- Choice of Hard Disk Drive
- Iomega 100MB ZIP Drive + 1 cartridge
- Matrox 16MB MillenniumG200 Video Card
- 19" SVGA L/R N/I Monitor (Viewable size 18" - 450mm)
- 32Max Speed V90 Voice\*FaxModem (UK only)
- 32Max Speed EIDE CD-ROM
- Dual Port SCSI Controller (Ultra & Wide)
- Midi Tower Case with PSU
- Windows UK Keyboard
- Microsoft IntelliMouse™
- **Software: Windows NT Workstation & MS Works 4.5**

with single processor	CELERON 400	PENTIUM II 400	PENTIUM II 450
10Gb EIDE	£ 1497	£ 1600	£ 1762
9.0Gb WIDE SCSI	£ 1704	£ 1807	£ 1969
18.0Gb WIDE SCSI	£ 2038	£ 2141	£ 2303

For dual Pentium®II processor systems:

Please add	£ N/A	£ 240	£ 402
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Above prices exclude VAT@17.5%.

### dantum 2 Duo Server

Mid-range Server

- Choice of single or dual Intel® **Pentium®II Processor** with 512KB Cache Memory
- 128MB PC100 ECC SDRAM
- Choice of Wide SCSI HDD
- ATI 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32" - 333mm)
- 32Max Speed SCSI CD-ROM
- Intel® Express Pro 100 UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- Full Size Tower Case with PSU
- Windows UK Keyboard
- Microsoft IntelliMouse™
- **Software: Windows NT Server** (5 user licence)

with single processor	PENTIUM II 350	PENTIUM II 400	PENTIUM II 450
4.1Gb WIDE SCSI	£ 1883	£ 1960	£ 2122
9.0Gb WIDE SCSI	£ 1975	£ 2052	£ 2214

For dual Pentium®II processor systems:

Please add	£ 163	£ 240	£ 402
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Above prices exclude VAT@17.5%.

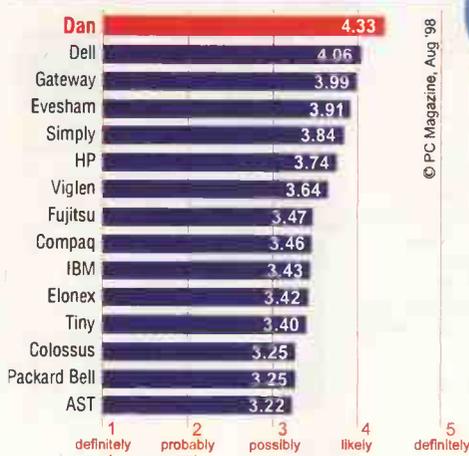
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# can prove expensive.

## PC press...

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AND BUY A  
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ON THE WEB**  
www.dan.co.uk

### LIKELIHOOD OF REPURCHASING FROM THE SAME VENDOR



are much more important to today's PC buyers.

So if *your* PC vendor is proving more expensive than you thought, maybe it's time to give us a call. We'll show you why our users keep voting us *Number One*. And if you're not interested in cheap PCs, then you're probably a Dan customer already!

All Dan PCs are built with BIOS compliancy



on this page show that factors like service, support and overall reliability

**1997/98 Annual Awards**  
from Computer Magazine Reader Surveys and Editorial Teams

- Service & Reliability Award**  
PC Magazine, 1993-8 Surveys
  - Most Reliable PC Manufacturer**  
PCW 1998 Awards
  - Best PC Manufacturer**  
**Best Hardware After Sales Service**  
What PC? 1998 Readers Awards
  - Best Network Servers Award**  
PC Direct Hits 1994-8 Surveys
  - Best Educational Systems**  
PC Direct Hits 1998 Survey
  - Best Service Award**  
PC Pro, 1998 Survey
  - Best Support Award**  
PC Pro, 1998 Survey
  - Best Customer Service Award**  
PC Plus 1997/8 Survey
- In addition, Dan has also received numerous monthly editorial Awards.



### Ultimate 2

High-end Multimedia PC

- Choice of Intel® Celeron or Pentium®II Processor with Cache
- 128MB PC100 SDRAM
- Fast 8.0GB Hard Disk Drive
- Iomega 100MB Zip Drive + cartridge
- ATI 8MB Xpert'98 AGP Video Card
- 17" Iiyama L/R N/I Monitor (A701GT) (Viewable size 16.2" - 405mm)
- 56K V90 Voice\*FaxModem (UK only)
- 32MAX Speed EIDE CD-ROM
- SoundBlaster Live! Value OEM
- Hi Fi Power Speakers (150W PMPO)
- Midi Tower Case with PSU
- Windows UK Keyboard, MS IntelliMouse™
- 1 Year On-site Maintenance
- Software: Windows 98 or 95 (specify) MS Works Suite 99, Serif Page Plus & Encarta 99 US Encyclopaedia

CELERON 400	£ 1270	£ 1493 incl. VAT
PENTIUM II 400	£ 1369	£ 1609 incl. VAT
PENTIUM II 450	£ 1525	£ 1792 incl. VAT

### dan Xplora 2

Multimedia Office PC

- Choice of Intel® Celeron or Pentium®II Processor with Cache
- 32MB PC100 SDRAM
- Fast 4.0GB UDMA Hard Disk Drive
- ATI 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32" - 333mm)
- 56K V90 Voice\*FaxModem (UK only)
- 32MAX Speed EIDE CD-ROM
- Sound Blaster PCI64
- Dan Advanced Speakers (10W PMPO)
- Desktop Case with PSU
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Software: Windows 98 or 95 (specify) & MS Works 4.5

CELERON 366	£ 673	£ 791 incl. VAT
CELERON 400	£ 701	£ 824 incl. VAT
PENTIUM II 400	£ 800	£ 940 incl. VAT

All systems also include: Fast EIDE PCi HDD Controller, 1 Parallel, 2 Fast Serial and 2 USB Ports, 1.44MB Floppy Disk Drive, MMX™ Brand Software (Ultimate 2 only).

\*additional speakers or headphones are required at additional cost.

WE ARE CONSTANTLY REVISING OUR PRICES AND SYSTEMS.

CALL NOW FOR LATEST OFFERS.

All systems have Lifetime Guarantee (first year full back-to-base parts and labour, then lifetime free labour - excludes certain monitors, scanners and printers - and Lifetime Telephone Support Hotline). Optional next-working-day (subject to customer location and time of call) response ON-SITE maintenance (£42 for the first year - UK mainland only - included as standard with Ultimate 2). **14 DAY MONEY BACK GUARANTEE IF NOT SATISFIED (excludes printers, scanners & software)**. Dan Technology systems prices and specifications are subject to change without notice. All sales are subject to Dan Technology terms and conditions, a copy of which may be obtained on request. Dan Technology is a tradename of Dan Technology Ltd which is a subsidiary of Dan Technology Holdings plc. The Intel Inside logo & Pentium are registered trademarks and MMX is a trademark of Intel Corporation. All trademarks acknowledged.

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Address: \_\_\_\_\_  
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VAT @17.5%. E.&O.E.

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technology

# Home and Internet PCs



## All Dan Home PCs are:

- Ready to run with multimedia and Internet capability
- Backed by 1 years on-site hardware maintenance
- Supplied with wordprocessor, spreadsheet and database



All Dan PCs are built with BIOS compliancy

### dan Home 2 Plus

with Celeron or Pentium II Processor

- 64MB PC100 SDRAM
- 8.0GB EIDE HDD
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATI 8MB All in Wonder Pro AGP Card
- 17" SVGA L/R N/I Monitor (Viewable size 16.2" / 400mm)
- 56K V90 Voice\*Fax Modem (UK only)
- Omega 100M Zip Drive + cart.
- 32MAX Speed EIDE CD-ROM
- Soundblaster Live! Value OEM
- Dan Subwoofer & Speakers
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard, MS IntelliMouse™
- MS Joypad, Microphone
- Windows 98 or 95 (please specify)
- MS Works Suite 99, Serif Page Plus, Encarta 99 US Encyclopaedia & MMX Software Bundle (5 titles)
- 1 Year On-site Warranty



\*additional speakers or headphones are required at additional cost.

		APR 29.9%
CELERON 333	£ 1070	incl. VAT £ 59.39
CELERON 366	£ 1109	incl. VAT £ 61.52
CELERON 400	£ 1137	incl. VAT £ 63.00
PENTIUM II 400	£ 1236	incl. VAT £ 68.43

### Microsoft Works Suite 99

Included as standard with Home 2 Plus and Gamestation systems

Microsoft Works Suite 99 is your total solution for everything you need to do with your PC. Whether you're writing a newsletter or school report, researching a project, surfing the internet, or calculating a debt-reducing budget, it has the intuitive software you need to do the task quickly and easily.

- MS Word 97
- MS Works 4.5
- MS Money 99 Basic
- MS Encarta World Atlas
- MS Graphics Studio: Greetings 99
- MS AutoRoute Express: Europe 98

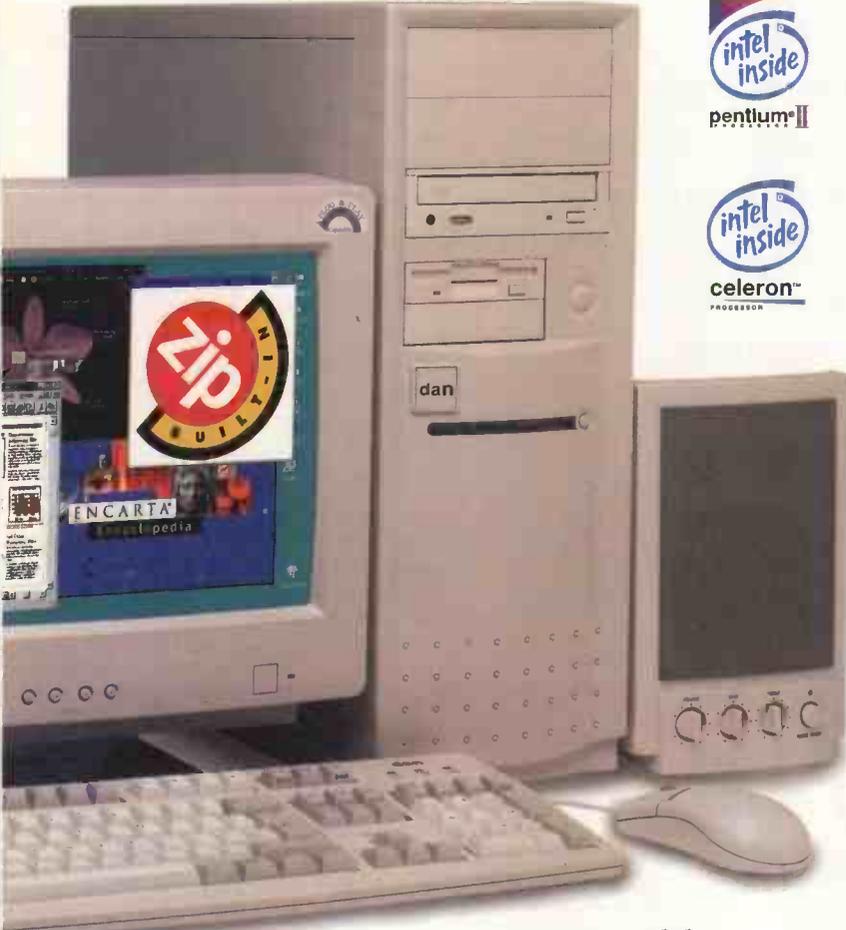


### ATi All in Wonder Pro Card



For the ultimate in multimedia graphics and video capabilities in a single card, look no further than the All in Wonder Pro. Based on ATI's latest 3D Rage Pro processor, the All in Wonder Pro offers about the most comprehensive solution there is for industry-leading 2D acceleration, arcade-quality 3D acceleration, video capture, output to TV and TV Teletext functions. Functions also include:

- Rage Pro powered 2D/3D graphics
- Still image and motion video capture
- Video playback software
- Intelligent TV Tuner
- Wide screen display capability
- TV set display with "Channel Surf", "Instant Replay", "Zoom" and "Scheduled Viewing".



Dan Xplora 2 Plus midi-tower case



## Popular Upgrades and Add-ons for Dan systems

Additional 32MB PC100 SDRAM	£ 36 (£ 43incVAT)
Additional 64MB PC100 SDRAM	£ 71 (£ 84incVAT)
8.0GB HDD upgrade from 6.4GB	£ 16 (£ 19incVAT)
6.4GB HDD upgrade from 4.0GB	£ 13 (£ 16incVAT)
DVD Drive upgrade from 32x CD-ROM	£ 116 (£137incVAT)
Upgrade the Dan Hi-Fi Speakers to:	
Yamaha YST-M20 Speakers	£ 22 (£ 26inc.VAT)
Dan Subwoofer & Speakers	£ 14 (£ 17inc.VAT)
FourPointSurround Speaker system	£ 29 (£ 35inc.VAT)
Panasonic SuperDisk 120MB + cart.	£ 59 (£ 70incVAT)

### EPSON Stylus Color 740

The Stylus Color 740 brings next generation professional quality output to your desktop. 4 colour ink technology and resolutions up to 1440dpi make this the perfect all rounder for Home Colour inkjet printing.

**Stylus 740**  
+ 1yr RTB warranty†  
**£ 169** (£199inc.VAT)

**Stylus 740**  
+ 3yrs on-site warranty‡ **£ 204** (£241inc.VAT)



### HP ScanJet 4100C USB Scanner

Featuring USB support (Win98 systems only), the 4100C boasts optical resolutions of 600dpi (1200dpi enhanced), 36-bit colour image processing and infinite scaling for monochrome logos and line art.

**HP ScanJet 4100C**  
+ 1yr RTB warranty†  
**£ 130** (£153inc.VAT)

**HP ScanJet 4100C**  
+ 3yrs on-site warranty‡ **£ 189** (£223inc.VAT)



†Return-to-base (RTB) warranty means that failed units should be returned to Dan Technology premises for repair.  
‡3 year on-site warranty means that a certified Epson engineer will repair the failed unit at customer's premises.



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

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www.dan.co.uk

## Games PC

### dan GameStation

with Celeron or Pentium II Processor

- 128MB PC100 SDRAM
- 8.0GB EIDE Ultra DMA HDD
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATI 8MB All in Wonder Pro AGP Card
- Voodoo 12MB Accelerator Card
- 17" Iiyama L/R N/I Monitor (A701GT) (Viewable size 16.2" - 405mm)
- 5x Speed DVD Drive
- 56K V90 Voice\*FaxModem (UK only)
- Soundblaster Live! Value OEM
- FourPointSurround Speaker system
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard, MS IntelliMouse™
- MS Joypads (x2), Microphone
- Windows 98
- MS Works Suite 99, Encarta 99 US, Serif Page Plus, & MMX™ Software Bundle (5 titles)
- 1 Year On-site Warranty



\*additional speakers or headphones are required at additional cost

CELERON 366	£ 1497	£ 1759 incl. VAT	£ 82.61
CELERON 400	£ 1525	£ 1792 incl. VAT	£ 84.14
PENTIUMII 400	£ 1624	£ 1909 incl. VAT	£ 89.57
PENTIUMII 450	£ 1780	£ 2092 incl. VAT	£ 98.04

APR 29.9%

## Multimedia Home PC

### dan Xplora 2 Plus

with Celeron or Pentium II Processor

- 64MB PC100 SDRAM
- 6.4GB EIDE HDD
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATI 8MB Xpert98 AGP Video Card
- 15" Super VGA L/R N/I Monitor (Viewable size 13.96" - 349mm)
- 56K V90 Voice\*FaxModem (UK only)
- 32MAX Speed EIDE CD-ROM
- SoundBlaster PCI64
- Dan Hi-Fi Power Speakers (150W PMPO)
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Microphone
- Windows 98 or 95 (please specify)
- MS Works 4.5 & MMX™ Software Bundle (5 titles)
- 1 Year On-site Warranty



\*additional speakers or headphones are required at additional cost

CELERON 333	£ 769	£ 904 incl. VAT	£ 42.97
CELERON 366	£ 808	£ 950 incl. VAT	£ 45.11
CELERON 400	£ 836	£ 983 incl. VAT	£ 46.64
PENTIUMII 400	£ 935	£ 1099 incl. VAT	£ 52.01

APR 29.9%

17" Monitor upgrade from 15" £ 62 (£73incVAT)

## Entry level multimedia Home PC

### dan Xplora

with AMD K6-2 Processor

- 32MB PC100 SDRAM
- 4.0GB EIDE Ultra DMA HDD
- AMD K6-2 Processor
- 512KB Pipeline Burst Cache Memory
- ATi 4MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32" - 333mm)
- 56K V90 Voice\*Fax Modem (UK only)
- 32MAX Speed EIDE CD-ROM
- SoundBlaster PCI64
- Dan Advanced Speakers (10W PMPO)
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Microphone
- Windows 98 or 95 (please specify)
- 1 Parallel & 2 Fast Serial Ports
- MS Works 4.5
- 1 Year On-site Warranty



\*additional speakers or headphones are required at additional cost.

AMD K6-2 350	£ 664	£ 781 incl. VAT	£ 37.27
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APR 29.9%

Delivery cost to mainland UK for one system is £ 19 (£ 23 incVAT)

## Personal FINANCE



A monthly payment scheme is now available to private purchasers, subject to status & proof of identity. All you will need to pay at the time of purchase is a 10% deposit of the total value (credit cards are acceptable). 12 months later you can choose to pay the outstanding amount in full without interest (by cheque only) or you can spread the balance over 36 months at 29.9% APR. A typical example of a payment calculation for a Dan computer costing £1228 incl. VAT would be: £1228 +£23 (delivery) = £1251 total cash price, payable by 10% deposit of £125.10 followed by 36 monthly direct debit payments of £58.00 (29.9% APR). Total amount paid over 36 months will be £2213.10. Written quotations are available on request. Dan Technology Ltd is a licensed credit broker.

## Popular Software Add-ons

### MS Office 97 for Students

Office 97 for Students, the world's best selling office suit, integrates unified productivity applications with the power of the internet. so you can get your job done faster and more effectively than ever before.

- MS Word 97
- MS Excel 97
- MS Access 97
- MS Bookshelf Basics
- MS Outlook 97
- MS Powerpoint 97

£ 107 (£126 inc.VAT)

### Inside Track GCSE CDs

Inside Track is a collection of past GCSE examination questions (with answers), that will monitor your progress and identify areas of strength and weakness, giving hints and advice for improved exam technique.

- GCSE English
- GCSE Maths
- GCSE Geography
- GCSE Science

£ 36 (£ 43 inc.VAT)



Dan Xplora desktop case

## Warranty Information

All Dan systems and components come with one year back-to-base parts/labour guarantee and Lifetime Hotline telephone support. Optional next-working-day (subject to customer location and time of call) ON-SITE hardware maintenance (£42 for the first year - UK mainland only - included as standard with selected systems). 14-day money back guarantee if not satisfied (excludes printers, scanners & software). All software supplied on original media, except Works which is only pre-installed on the hard disk. Dan Technology systems prices and specifications are subject to change without notice. All sales are subject to Dan Technology Ltd terms and conditions, a copy of which may be obtained on request. Dan Technology is a trademark of Dan Technology Ltd which is a subsidiary of Dan Technology Holdings Ltd. Intel Inside logo & Pentium are registered trademarks and MMX is a trademark of the Intel Corporation. All trademarks acknowledged.

## Creative Sound Blaster Live!

Immerse yourself in sound so vivid, you experience games and music rather than just hear them! Features include the superior surround-sound rendering of Environmental Audio, 256 voices of music synthesis and real time audio enhancement, and Environmental Audio Extensions.

Upgrade to the Sound Blaster Live! (Full version):  
from Sound Blaster Live! Value £ 71 (£ 84inc.VAT)  
from Sound Blaster PCI64 £ 103 (£122inc.VAT)



## Matrox Marvel G200

The Marvel G200 video card offers the most comprehensive, all-in-one graphics solution with acceleration for 2D, 3D, DVD video, hardware MJPEG video editing, PC to TV output, video conferencing, and more. Features 8MB memory of memory and MGA-G200 graphics chip.

Upgrade to the Matrox G200:  
from 4MB 3D Charger AGP £ 138 (£163inc.VAT)  
from 8MB All in Wonder Pro AGP £ 83 (£ 98inc.VAT)



## Iomega Zip Drive

Included as standard with Home 2 Plus

The Zip is an easy to use, affordable personal storage solution using 100MB cartridges. An ideal way to move and store data, Zip cartridges are robust yet small, light and convenient. Perfect for multi-media, software applications, financial data, graphics and sound, file archiving and more.

Iomega 100MB Zip Drive + cart. £ 59 (£ 71 inc.VAT)



Opening Hours - London/Leeds Showrooms: Mon-Fri 9.30am-6pm

Leeds: 0113 259 1200

LONDON: Ironbridge Close, Great Central Way, London NW10 0NW. FAX: 0181-830 1122  
LEEDS: 10-11 Feast Field, Town Street, Horsforth, Leeds, LS18 4TJ. FAX: 0113-239 0652

Internet: www.dan.co.uk

e-mail: sales@dan.co.uk

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## Reprieve for Windows 98

Windows 9x has been reprieved, Microsoft has confirmed. The operating system was to have been phased out in favour of Windows NT, giving one code set for both business and home PCs.

Reconciling their needs has proved more difficult than Microsoft expected. One advantage of a single core OS, which remains a goal, is that peripherals would need only one set of drivers.

Microsoft says it will issue service packs and updates to Win 98 for the foreseeable future.

A consumer NT is unlikely to ship until well after the launch of Windows 2000, successor to NT 4.0, which seems to have slipped well into next year.

VNU NEWSWIRE



## New Nokia handheld

Nokia has launched a new version of its groundbreaking Communicator, which combines the functions of a phone and personal organiser. The new 9110 boasts a MultiMedia Card slot for extra storage, a backlit screen, and improved user interface. A new PC suite facilitates the synchronisation of data with that held on a PC. Users will be able to send pictures wirelessly by linking to a digital camera via an infra-red port. The 9110 uses an AMD 486 chip and the GEOS operating system. Prices were unavailable

as we went to press.

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

CLIVE AKASS

## INTERNET

# Cable vies with ADSL as web runs fast and free

Fast, relatively low-cost web links for UK users moved tantalisingly closer last month as cable companies announced plans to compete with BT's ADSL.

One slight dampener came from BT, which has extended its ADSL trials in London to 'overcome a few problems which had arisen.'

But interactive marketing manager Rebecca Webster said she still expected a rollout to start late this year.

NTL, one of Britain's big three cable companies, says it will begin rolling out a data service for cable modems in a couple of months.

Charges have yet to be announced but sums of £30 to £40 a month have been

talked of for both cable and ADSL. This pricing is likely to fall — perhaps to nothing.

A company called Edge Technology is offering ADSL anywhere in the country now for £500 a month, but that is with guaranteed quality of service.

See my news analysis for more on this and also on how cable and ADSL compare: NTL offers 256Kb/sec each way, ADSL gives 2Mbit/sec downstream and 256Kb up; but these figures are deceptive.

NTL is using 3Com modems, which users will have to buy, and its net service will be hosted by Virgin, which is

also trialling ADSL. The other two cable companies have similar plans to NTL's but are being less forthcoming.

Meanwhile BT became the latest company to offer free access following the runaway success of Dixon's Freeserve, which claims to have topped a million users since it started late last year. Tesco is also launching a similar scheme.

Ironically BT is one of several companies which complained to telecoms watchdog Ofcom about the free services.

Ofcom is investigating but denied a report that free web access is under threat. Access is partly financed by a cut the provider is taking on the call charge by acting as a reseller for BT. An Ofcom spokeswoman

said the dispute is about the size of this cut and does not put the service at risk.

Ofcom is also looking at BT's ownership of the local loop, the final link to homes, which could become an issue as ADSL use spreads. BT gets to far more homes than cable.

## III is a crowd as Intel and AMD launch new chips

Intel finally launched its PIII last month amid massive advertising. But even at this top end of the market it is facing increasing competition, writes Ajith Ram.

Evidence is surfacing that it is not as powerful as assumed. Some developers optimising their games for PIII report a modest 20 to 25 percent boost compared to Intel claims of up to 200 percent.

Internet reports suggest that AMD's

cheaper K6-III, due to launch this month, might equal or exceed PIII performance. If true, a K6-III with a decent graphics card could be a tempting alternative.

Mike Magee writes: The fact that AMD used the Roman K6-III to match the new Pentium is likely to infuriate Intel, which somehow persuaded AMD not to call the K6-2, the K6-II, like the rival PII.

The new chips sparked an expected

round of price cuts on other chips, with Celeron prices falling up to 24 percent and commensurate cuts from AMD.

● Intel's forthcoming 64-bit Merced, aka IA64, will be 20 times faster than the Pentium Pro and three times faster on 3D graphics than the Xeon, says an Intel document. It is due to ship next year.

Turnaround on chip ID - see page 33

PIII group test - see page 148

## MOTHERBOARDS

# Enter the throwaway PC

A new highly-integrated chipset could lead to the throwaway PC — one which you upgrade by swapping in a new system box.

The Apollo MVP4 chipset from VIA Technologies heralds a new wave of PC design in which functions, such as graphics and sound, which now sit on expansion cards or the motherboard will be packed into the core logic chips.

This will limit upgrade options but there is huge interest in no-fuss machines which allow minimum user intervention.

VIA is keen to promote the chipset for use in laptops. It integrates 3D graphics with simultaneous CRT and DFP support, TV out and video



capture; other features include AC-97 audio, soft modem, UDMA/66 and support for four USB ports.

The design looks forward to the Device Bay architecture, which turns the PC into a stack of modules linked by USB and 1394 buses. You upgrade simply by adding or

swapping a module; emerging low-cost designs mean this can include the system box.

Next in Via's pipeline are the Apollo Pro133 chipset, with support for AGP 4x and the emerging 133MHz front side bus, and the VIAFire VT 6305 which integrates 1394, Device Bay and LAN support.

Marketing director Dean Hays said further integration of core logic with the CPU is possible but will not be pushed without the support of main processor manufacturers.

VIA was the first company to acquire a development license for producing core logic chipsets on Intel's Slot 1 platform. IAN ROBSON

Via [www.via.com.tw](http://www.via.com.tw)

## short stories

### 18in LCD

Okay so most of us can't afford an LCD desk display like this 18in iiYama Pro Lite 46, which costs £2339 ex VAT.

But it costs you nothing to drool. The screen is equivalent to an 20in CRT, and it offers 1240x1080 resolution at 75Hz.

iiYama 01438 745482

### MP3 HARDWIRED

A new chip from the US firm ESS will facilitate support for

MP3 briefing — see pages 38 & 39

MP3 audio in devices such as set-top boxes and personal stereos.

MP3 has shaken the music industry with its ability to pack sound tightly enough to be sent over the net.

JAN HOWELLS

## Revolution in the Palm of your hand

Two more Palm handhelds have been launched by 3Com, writes Paul Smith. The £280 Palm IIIx looks like the Palm III but has a crisper screen, 4Mb of RAM and a faster processor. The sleek £350 Palm V (pictured) is likely to make more of an impression. It's about half as thick as other Palms and weighs less than 4oz complete with an anodised aluminium case.

It has the same features as the IIIx but only 2Mb of RAM (the same as the standard Palm III). But, unlike other Palms, it uses rechargeable lithium-ion batteries. The software is essentially unimproved. Britain is unlikely to see the recently announced Palm VII, with integrated wireless data comms, for some time. There are also no plans to follow the Windows CE PalmPC route of colour screens. See next month's PCW for a full review of the Palm V.



## Lotus notices Linux

The long-awaited Release 5 of Lotus Notes and Domino was due to ship as we hit the streets.

It was expected to launch in time for January's annual Lotusphere conference but was delayed.

Lotus president Jeff Papows surprised the conference by announcing that he would ship a Linux version of Notes, though the operating system would not come for free.

The announcement rever-

ses an earlier decision. 'I've change my mind,' he said.

Linus Torvalds, creator of Linux, has just signed off the latest release 2.2.0 which supports a variety of processors.

The OS has got further support, with Silicon Graphics and Hewlett-Packard saying they plan to offer it on their servers.

● The new Notes — page 40

Lotus [www.lotus.com](http://www.lotus.com)

## Watch out scruffs, the army's here!

Long-haired scruffs of programmers at ICL could be in for a dose of spit and polish

The services company is reported to be recruiting ex-soldiers to make up for a skills shortage.

ICL apparently believes officers used to leadership and discipline will make good project leaders.

Ironically the army has been trying to recruit young PC buffs as soldiers.



Nice report Colonel. But don't you think it is a teensy bit tactless to keep referring to the client as the enemy?

## Y2K bug affects most new PCs

Nearly 98 percent of new PCs are still not fully 2000 ready, says Y2K specialist Fernlink. They have what is called the latency bug, of no importance to most users but potentially disastrous to some, managing director Ralph Terrill said.

The 'latency' is a delay in updating the BIOS date. This is done only on boot-up or on a call to the BIOS, which gets the information from the PC's built-in digital clock.

The BIOS stores the vital century digits at address 32H. A problem arises if a program reads the date directly, bypassing the BIOS and thus not prompting an update.

This happens mostly in custom-written software. 'But mission-critical software is often bespoke and it runs on machines which are likely to be on all the time,' Terrill said.

Many buyers of his hardware solution are military.

● Greenwich Mean Time has launched a five-user small-business edition of its Y2K bug-buster, Check 2000.

GMT 01329 825468; [www.gmt-2000.com](http://www.gmt-2000.com); Fernlink 01202 522324

## MICROSOFT TRIAL

# Red faces over \$6.3b profit

Microsoft, embroiled in an increasingly embarrassing antitrust trial, tactlessly reported 40 percent profit on an income of nearly \$5 billion in just the last three months of last year.

It made \$1.98 billion, an increase of 70 percent on the previous year, on revenues of \$4.94 billion — up 38 percent. Revenue for the whole year, up to December 31, was \$16.6 billion, of which \$6.36 billion or 38 percent was declared profit. Microsoft says the real profit, taking into account the cost of staff stock options, was \$5.375 billion.

Chief economic defence witness Richard Schmalensee, dean of MIT's Sloan School of Management, was forced to defend the figures at the DoJ hearing where Microsoft is accused of illegally protecting an operating-systems monopoly and using it to muscle in to

the internet browser market. Government lawyer David Boies asked if a string of profits as large as Microsoft's could indicate a monopoly. 'A valuable piece of intellectual property can indeed yield a long string of profits,' replied Schmalensee.

If Microsoft really had the monopoly claimed by the government, it would be charging up to \$2,000 for Windows. 'It's absolutely at odds with common sense that a monopolist would settle for \$50,' Schmalensee said.

ADDITIONAL REPORTING, DOMINIQUE DECKMYN

● Microsoft the minnow? See news analysis, page 40



## Not just a pretty picture

This gouache by Robert Pell of Brackley, Northants, was part of a web exhibition by local dealer Right Angle, which has been selling antique prints, drawings and watercolours since last year.

<http://users.powernet.co.uk/pictures>

## POINT OF VIEW

# Gamblers anonymous

Three years ago I did a story about a company called Comstrad occupying what looked like an entire floor in St James, one of London's nobbiest areas, flogging for no less than £3,300 a program that purported to pick winners.

You can judge the standard of the program from the fact that at one point users were expected to add some figures up themselves. Its main purpose seemed to be to lend a certain high-tech lustre to a cover-your-losses betting system of a type occasionally offered for sale in the seedier sections of the small ads.

I was, to be honest, slightly nervous about the mocking piece that I wrote. St James is just down the road from PCW Towers. The day the edition hit the streets I got an angry call from a man with an Australian accent who said: 'You have just cost me £6,000. I've had two cancellations this morning and that effing magazine of yours is only just out.'

Don't speak too soon, I told him. You can't overestimate people's gullibility. If a hundred thousand people read that article, you can bet your boots that at least one in a thousand will be fool enough to think you are offering a good thing. You could make a lot of money.

I have no idea who the man was. But last month the *Financial Times* reported that one Kevin John Robinson, who ran Comstrad, had been banned from being a company director for 13 years.

Comstrad was wound up in October 1996 with debts of £457,233, not counting claims from customers, after the High Court decided that it had been conducting a serious fraud. The report said Comstrad had screwed £4.5m from at least 2,000 punters.

What baffled me was why Comstrad didn't do the thing properly. If software

can give an edge on the stock market, it may do so on the horses. Even if it can't, gambling is such a huge industry that you could make an honest margin on a program that seriously tried.

This month a man called Larry Weltman came to see me. He is executive vice president of a company called Gaming Lottery Corporation (GLC) which is running an online casino on the Caribbean island of St Kitts (see page 36).

I stress that I am not suggesting he is fraudulent. I know little of him or GLC, which appears to be a substantial enterprise. I do, however, have a view on the judgement of people who are willing to pass money to a company which is practically beyond legal recourse.

One thing Weltman said struck me. He told me: 'We want regulation.'

The fact is that if you get a gaming licence, there is no point in going beyond the law. The force is with you. You have a licence to print money.

Clive Akass



muses on just how daft people can get

CONNECTIVITY

# Vendors bet each way on Jini

Sun finally launched its **Jini global connectivity technology** last month just a few days after what looked like a spoiler announcement from Microsoft of a 'Universal Plug and Play' (UPnP) spec.

Java-based Jini would allow devices to be plugged in to a network and work just as you plug a toaster into the mains and expect it to go.

The device announces what it is and services it can offer to other devices on the network. It could be used in conjunction with technology such as Bluetooth for wireless nets.

Microsoft announced its



UPnP initiative in January but gave few details other than that it would use XML, the mark-up language which is designed for machine-to-

machine communication.

Guy Martin (left), Sun technical manager for Northern Europe, said: 'UPnP is still just an announcement, not a technology. Jini is ready for use now.'

Several leading vendors have declared an interest in Jini but many are also looking at UPnP. Microsoft says it will show a reference implementation in April, and that devices will be ready this year.

Sun is also working with Philips on how to incorporate Jini into the Home Audio Visual Interoperability standard (HAVi) (see below).

## short stories

### EUROPE CATCHES UP

The technology gap between Europe and the US is vanishing, says a report from analysts IDC. US vendors are still dominant here, but European firms are beginning to take hold over there, says the report. Intel predicts that the Euro-US IT gap will disappear this year, with new technologies being released simultaneously across the world, according to the report. Steve Minter, senior vendor special at IDC's European markets centre, cites the use of smart cards as one area where Europe is ahead.

### YEAR OF THE VIRUS

Last year was a record year for new viruses, says a report from anti-virus specialist Sophos. There were seven major new types, including the vicious CIH virus which overwrites data on your hard drive and can even scramble the BIOS in some machines, making them impossible to boot without recoding. Sophos 01235 559933

### EASY STEPS

UK bookshops will be selling two In Easy Steps manuals, which cover a variety of PC topics, for the price of one (£8.99) from March.

### GROUP TEST UPDATE

Just as we sent the monitor group test pages to press, ADI dropped the price of its MicroScan GT56 to just £285 from £299. Both prices include the USB hub.

## ...as Philips plugs home networking

Philips is exploiting its experience of both PC peripherals and consumer devices to produce a range of solutions to **link your PC to your TV**. Ambi is a wireless system that allows two users to use the PC at once. It uses a PC Card attached to a transmitter, and the receiver at the TV end can be 150 feet away, not line of sight. The claimed data transfer rate with compression is 120Mbit/sec.

You can still keep your PC in the back bedroom, but use the TV to run applications and surf the net. The PC is effectively split in half and can run different applications on the TV to those being used on the PC.

Philips also announced the emerging

HAVi standard which will let you create a home network for appliances such as TV, video, hi-fi and PC. Based on IEEE 1394, HAVi should make it easier to get your appliances to work together and to control them using a common interface. For more on HAVi, see next month's *Futures*.

Philips also announced a new Nino, a palm-sized PC with a colour screen running WinCE, very much like the HP Jornada 420 reviewed this month (*Reviews*, p82).

ADELE DYER



### Another way to share

Sharedware has another idea on how you can get **two PCs for the price of one and a bit**. It has just shipped a PCI-based version of its ISA-based *Savage Office*, which allows you to create two PCs out of one. You stick the card in the PC and plug in a second mouse, keyboard and monitor — or TV — and effectively you have two PCs. You can run separate applications on each, or a game for two players. The *Savage card*, which packs both a sound and a 2D/3D graphics card, costs £199.75 including VAT. The ISA pack now costs £152.75 inc VAT.

Sharedware [www.sharedware.com](http://www.sharedware.com); 01274 401010

The company which developed the software many notebooks use to hot-swap PCMCIA cards is offering a kit which allows desktops and mobiles to share peripherals.

Agate's DN-Boy consists of a PCMCIA card, a box for a standard hard disk, and another which fits into a PC drive bay and offers an IDE connection. You use the card

### ...and one for laptops

to connect the disk to a notebook, and the IDE box to connect to a PC.

The main market will be people who use the same data on their laptop or PC. Future versions will support Zip, tape and CD drives. The DN-Boy will sell here for about £80. [www.agatech.com](http://www.agatech.com)

ThinkPad® 390

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thinkpad.start-up



\*Typical buying price for ThinkPad 390 model 200. Resellers set their own prices, so prices may vary. <sup>1</sup>MHz denotes microprocessor internal clock speed only; other factors may also affect application performance. <sup>2</sup>GB = Gigabyte (one thousand million bytes) when referring to hard drive capacity; accessible capacity may be less. <sup>3</sup>MB = one million bytes when referring to hard drive capacity; accessible capacity may be less. All PCs referenced in this ad ship with an operating system. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows and Windows NT are trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation.

## PROCESSORS

# Intel backs down over surfer ID

Intel has backtracked over a **new ID code in processors** which sparked a boycott call from privacy groups. The code on the latest PIII chips can facilitate online purchases by providing a check on a credit card number. It is also an aid to network management.

The code is hardwired into the chip but can be switched off by software. You then have to reboot to get it back on again. 'We didn't want hackers to be able to switch the chip on using software,' said Intel marketing director, Gordon Graylish.

Now Intel has agreed that by default chips will be switched off by software during startup; later boards may offer a BIOS option. A spokesman said: 'This move is intended to address



any public concerns.'

The Electronic Privacy Information Centre in Washington, and Privacy International in the UK, claimed the code would be used to track people's surfing activities.

Policy director David Banisar said that the boycott call would stay despite the Intel turnaround because the onus was still on the user to be aware of the issue.

An Intel spokesman said the company had no records linking the code to the purchaser of the chip and accused the groups of over-reacting. 'If a credit card is stolen, the thief would not be able to buy goods with that card from any other PC.'

The facility is to be added to other chips later this year.

ADDITIONAL REPORTING  
JO PETTITT

## short stories



### I-MATCH

This £89 (ex VAT) Teac USB floppy drive has been styled to match the iMac for which it has been designed. Teac 01923 225235 [www.teac.co.uk](http://www.teac.co.uk)

### ANTI-HACK PACK

Microsoft has issued two anti-hacker patches for its office software. One, for Word 97, will warn against a document linked to a template which may contain malicious macros. The second plugs a hole in the Forms 2.0 ActiveX control which would allow a hacker to read a web host's clipboard.

### ZIP-ITTY DOO DAH

A new utility from Atypie Software lets you use zipped files from within Windows 9x/NT applications and automatically update files within zipped archives. Zip Office 98 also offers standard zip file management facilities and supports all popular formats including lha, arc, arj, zoo, and uue. A Virtual Folders feature lets you organise net downloads.

A free trial copy of Zip Office 98 is at [www.zipstore.com](http://www.zipstore.com).

### SCANNER CLANGER

A picture in last month's News, of Icom's IC-PCR100 radio scanner, was wrongly captioned as the PCR1000, which costs more.

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



# Lost and found

A new security system provides protection against absent-mindedness as well as thievery. The Gemini Alarm has two parts: a transmitter which sits with your laptop, and a receiver which you carry with your keys. This starts beeping if it is parted from the transmitter. The same system is being adopted to warn of straying children.

## SURVEYS

# Compaq slated again on notebooks

The quality of Compaq notebooks has again been slated, for the second time in two years. A survey by US-based Technology Business Research (TBR) said Compaq improved on price/performance and delivery time last year but still underperformed on quality and long-term reliability.

Toshiba also scored badly for repair time, support response and price/performance. IBM, Dell, Compaq and Toshiba all showed weaknesses in the timely delivery of notebooks, according to TBR.

The TBR survey of 300 IT managers in top companies ranked customer satisfaction in three sectors: notebooks, desktops and Intel servers. Dell ranked top in all and IBM ranked highly on servers.

Compaq failed to comment on the report. In mid-1997 a Compaq laptop was placed on the Gartner Group's influential Problem Watch report, causing major ructions in the company.

Compaq was placed last in a table of customer satisfaction compiled by another research company, Sherwood.

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But you always know how it's working.

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## AutoDesk hopes to draw in mid-market

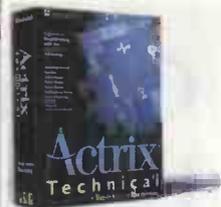
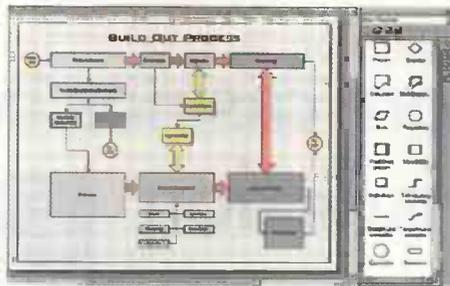
**A**utoDesk has released a major revamp of its flagship product, **AutoCad**. New features include facilities for web publishing. Following the fashion for naming new software releases after the millennium, it is called AutoCad 2000. The previous edition was AutoCAD 14.

AutoDesk got into CAD so early it established a *de facto* standard. But like

other such pioneers, it has been hampered by its legacy. The full product is expensive and needs skill to use, and there has been much competition for cheaper, easier, simpler products.

Visio brought out a sub-\$500 AutoCad clone called IntelliCad, though Autodesk challenges the degree to which its files are compatible.

Regional sales chief, Tim Taylor, is anxious to dispel



▲ EUROPEAN LAUNCH IS DUE FOR AUTODESK'S LOW-END DRAWING PACKAGE, ACTRIX

the idea of Autodesk as a one-product company. 'We have products across the whole spectrum of design, media and GIS [Geographic Information System] markets.' He points out that Autodesk already has cheaper products including AutoCad Lite, and it will shortly be launching

in Europe a diagramming package called Actrix (pictured above) which will compete with Visio's low-end drawing packages. Currently it is available in the US.

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

## AT&T deal to boost communications research

**A**T&T has bought the Olivetti & Oracle Research Lab for £30m. Research into networking, multimedia and mobile communications systems will be its prime focus and it will be renamed AT&T Laboratories.

The lab's founder, Professor Andy Hopper, will continue to direct the work of its 50 full-time research staff, collaborating with the University of Cambridge.

As part of the deal, AT&T is to contribute £1.2m towards a new Laboratory of Communications Engineering (LCE). 'There is a tremendous synergy and meeting of minds between research in Cambridge and AT&T Labs in the US,' said Prof Hopper. 'Over the past five years we have been responsible for over £100m of inward investment into research at the lab, the University and three successful spin-out companies. With AT&T's backing we expect this figure to accelerate.'

Some 2,000 AT&T technologists worldwide are developing an advanced broadband net-based global communications network. The company is also researching systems which 'understand' and respond to spoken language.

David Nagel, AT&T's chief technology officer, said Cambridge expertise would help create the next generation of personal

communications technologies and services for businesses and consumers throughout the world.

➤ **UUNET, the service provider** owned by MCI WorldCom, is another big player making multi-million pound investments into UK regions. It is installing a 4Mbps internet hub in Northern Ireland which in time will be upgraded to 16Mbps. The new hub will be hosted by Supplier Index, a specialist in e-commerce and electronic data management.

➤ **Cambridge Consultants Ltd** (CCL) is collaborating with mobile specialist STNC to develop a range of digital telephony products capable of accessing intranets and making voice calls. They will focus on how to display graphical information on small, cordless devices.

CCL announced a low-cost zero-blindslot design for use in DECT (Digital European Cordless Telephony) applications, different from much of the existing DECT equipment which uses single blindslot radio.

CCL spokesman Andrew Watts explained that while traditionally cheap, the latter only makes use of half the traffic capacity allowed for by

DECT standards. Its own design can be manufactured for less than \$10. The new circuit, which can be integrated by customers into their own products, will be available in May.

CCL, Muscat and Cambridge bioinformatics firm, Synomics, have signed an agreement to co-operate in the provision of advanced IT to facilitate commercial drug research by exploiting in-house knowledge.

➤ **Muscat is launching Empower**, a new product line, to provide an enterprise-wide system for retrieving knowledge based on the company's Linguistic Inference technology.

Empower uses language 'constructs', as opposed to translating language into mathematical patterns, which allow searches on a simple definition of the knowledge area required. Muscat chief executive Chris Nowell says it is designed not just to find a match to a search, but 'to work with the user to understand the information and accurately match their interests.' A demonstration of Muscat Empower can be found on the company's web site.

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[www.uk.uu.net](http://www.uk.uu.net), [www.stnc.com](http://www.stnc.com),  
[www.camcon.com](http://www.camcon.com), [www.muscat.com](http://www.muscat.com)

Caroline Swift



continues her reports from Silicon Fen

## GAMBLING

# Offshore casinos beyond UK jurisdiction

A new online gambling casino offering jackpots of up to \$1m raises questions about how to regulate gambling on the internet.

GalaxiWorld, which offers 30 casino-style games, is based on the Caribbean island of St Kitts where it is subject to neither British nor US gaming laws. It is owned by the Gaming Lottery Corporation (GLC), which is NASDAQ listed, and claims to have taken \$7.3m in January, its second month of operation.

Executive VP Larry Weltman, who was in London last month, said GLC had put \$25m into developing the site,

which had been set up in St Kitts only because the island had put into place the necessary regulatory structure. Weltman claimed: 'We want regulation, but no other country has it in place.'

He said punters first buy their stake in e-cash from a company called G.Cash. Its web site gives its address as a P.O. box in Gibraltar.

Asked how punters can be sure they will get their money, Weltman said \$5m had been put into a special account to guarantee winnings.

Gambling is one of the fastest growing net activities,

says web specialist David Flint, of Glasgow law firm MacRoberts. He points out that there is no way of knowing if punters really are winning on a remote site and 'there is little point going to your local trading standards office if you have trouble getting your money.'

• See *Point of View*, p30

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



## Objets d'web

An 18th-century Queen Anne bookcase is one of the few exhibits actually on view at auctioneer Sotheby's new web site at [www.sothebys.com](http://www.sothebys.com).

There are hints on how to collect and details of the latest auction, but online catalogues are strictly text-only. As yet, it has no online auctions.

# Brides-web revisited

Weddings are big business and already the subject of a number of publications. Naturally, there are also web sites dedicated to the subject. A new one, at [www.confetti.co.uk](http://www.confetti.co.uk), covers everything, from tips for the bride and groom, how to turn down an invitation to be bridesmaid, and travel arrangements

for the honeymoon. You can register free and set up your own password-protected area where you can post gift lists and even your own wedding photos. The site points out that the average wedding costs £14,000 including cucumber sandwiches, so you are going to need anything which will keep costs down.



# The smart money is on the cards

PC-based e-cash will give way to a **smart-card money system**, according to e-banking specialist JCP. It points out that Digicash, one of the main e-cash companies, went into Chapter 11 protection late last year and rival Cybercash is losing money.

Marketing director Chris Philips says other systems, such as Digital's Millicent, are unlikely to flourish because they offer nothing that seems like proper 'money': it cannot be spent in the pub or shops. Moreover, most of these systems are PC based, whereas much e-commerce is likely to be transacted via appliances such as Java stations. But current credit-card charges are too high to support micropayments, which are necessary for e-trade to prosper at high-street levels.

These charges are unlikely to fall, so smart-card based cash remains the most likely option. The cards, which are expected to be introduced by London Transport soon, can support several methods of payment. 'People are used to using credit and debit cards, so smart cards don't seem to be very different,' said Philips.

• Traditional retailers risk losing market share by underestimating the impact of the web, writes *Newswire's* Angela Soane. IDC analyst Liz Frankle says many appreciate the huge increase in users. 'Online users have become a nation within a nation,' she said. 'Merchants can no longer ignore the impact.'

JCP 0171 689 6890, [www.jcp.co.uk](http://www.jcp.co.uk)

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- Joypad, Microphone
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### dantum II /HS Upgrades

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#### HP ScanJet 4100C USB Scanner

Featuring USB support (Win98 systems only), the 4100C boasts 600dpi resolution (1200dpi enhanced), 36-bit colour image processor and infinite scaling for monochrome logos and line art.

**HP 4100C Scanner**  
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IAN ROBSON SPECIAL REPORT ON MP3

## MP3 rocks the music industry boat

It's only rock 'n roll — and it's coming off the web in **small files** that are causing a big stir.

**M** P3, a way of storing music in small files that can easily be downloaded from the web, is causing turmoil in the music industry and seems destined to enter the consumer mainstream.

Older formats used about 10Mb to store one minute of quality music: MP3 provides near-CD quality at just 1Mb per minute. Currently, files can be played only on a personal MP3 system like the Diamond Rio (see opposite page) or on a PC using Microsoft's Windows Media Player or one of many other MP3 players.

These include Nitrane, MPG123, Audio Enlightenment, X-Audio, WinAmp (MacAmp on the Mac), Wplay, Sonique, and K-Jofol. Apple's QuickTime does not currently support MP3.

MP3 encoders include L3ENC, .mp3producer, AudioActive Producer, Blade, 8Hz, Plugger, Audiograbber, and (for Mac and PC) Audio Catalyst.

The well-received Xing Encoder, with Variable Bit Rate (VBR), is said to



convert CD tracks in less time than it takes to play them. It can be configured to encode while you listen.

Internet music label Goodnoise, and Adaptec, developer of the widely-used EZ CD Creator package, are co-developing software that would store up to 150 MP3 files on a recordable CD. It would allow CD players in homes and cars to play MP3 files using converter software.

Analysts believe Adaptec and Goodnoise will have problems getting their software accepted by heavyweights like Sony, given the feeling in the industry. The two companies are undeterred, however, and claim to have had numerous enquiries from hardware makers.

MP3, which is actually audio layer 3 of the MPEG 1 video encoding

standard, works by eliminating frequencies we can't hear. It has been criticised for a certain blurring of the remaining frequencies and a poor implementation of stereo. These and other criticisms are addressed in MPEG-2 Advanced Audio Coding (AAC), principally developed by the people who invented MP3.

AAC is not backwards compatible and is sometimes called MP4 (see box, below). It is said to pack better-quality sound than MP3 into files 30 percent smaller; however, files can take four times as long to encode.

AAC is well prepared for future audio and video developments but is currently stifled by a lack of licensed development programs.

Another option is TwinVQ, referred to as VQF after its file extension. This requires more power to play and encode but results in smaller files than MP3 with similar quality. Players include K-Jofol, and WinAmp with the VQF plug-in.

Perceptive Audio Coding (PAC), developed by Bell Labs/Lucent, offers real-time encoding at extremely high quality. Celestialtech's Audiolib 1.0 is currently the only encoder/player.

## Will the real MP4 please stand up?

**PUBLIC ENEMY**  
Words, in the words of Keith Murray, are a beautifulist thang. Swindlers come in all shapes, sizes and colors, don't they?  
The majority of fans and artists are heaped upon each other, pile swept in a horrorcost.... A lotta folk been had by the execs and legal lust of the industry....  
So this is anti-corporatism, and watch the reaction to this lyrical swirl....  
Ready... aim... MP-4  
**DOWNLOAD NOW!**  
Swindlers Lust mp-4 (2702k) [wav 9:2/nt]  
Swindlers Lust mp-3 (3441k)  
[ HOME ] [ TERRORDOME ] [ ENEMYBOARD ]

**P**ublic Enemy debuted on the web a song from their yet-to-be-released latest album in what was billed as MP4 format, leading to reports that this was the first public airing of the successor to MP3.

In fact, the file was created by Global Music Outlet (GMO) which packed its a2b format (see main story, opposite) into an executable file which is not compatible with MPEG audio.

However, requiring no additional software and unusable with any audio application, it does afford a certain level of security.

The official MP4 standard (actually audio layer 4 of the MPEG 1 standard) is expected to be published by the International Standards Organisation this month [March].

*Wired* reported that GMO has filed for and received a trademark on MP4, but this could not be confirmed at press time. **MP3.com**, reputedly the second most popular music web site, owns the MP4 domain name and hopes for an early resolution of the confusion.

IAN ROBSON SPECIAL REPORT ON MP3

## Sour notes as new format finds its feet

Never mind the quality, **is there a future?** The MP3 question still to be answered.

**T**he music business is deeply divided over MP3. A measure of the problem is the fact that the entire Beatles back-catalogue has been packed onto one MP3 CD which sells in Russia for just \$2.50.

Most supporters in the industry believe MP3 can help create a viable online music business provided there are incentives to make people buy rather than steal. Pro-MP3 performers argue that it gets people listening to their music and a percentage of these will buy it on CD.

Record companies aren't so sure. Capitol forced The Beastie Boys to replace MP3 downloadables on their Grand Royal web site with

inferior Real Audio files. Public Enemy (*see opposite*) split with their label over a similar incident when they previewed tracks from their new album over the internet.

Creation Records boss Alan McGee, he who released Oasis upon us, is convinced that the web will become an industry asset and his site at [www.creation.co.uk](http://www.creation.co.uk) offers MP3 files.

He insists that people will still want to buy records and dismisses the argument that buying music via the web is still too hard for most people. 'This is the new music business,' he says.

On the other hand, nearly 400 musicians signed a petition handed to the European Parliament in January by French composer Jean-Michel Jarre urging

more copyright protection in the light of digital advances.

In December, the Recording Industry Association of America (RIAA) and five of the world's

largest recording companies launched the Secure Digital Music Initiative (SDMI) to create an umbrella standard for secure digital music. Nullsoft will soon offer a

**'This is the new music business'**  
[Alan McGee, Creation Records]



▲ MCGEE BELIEVES THAT THE INTERNET WILL BECOME A MUSIC INDUSTRY ASSET AND OFFERS MP3 FILES ON HIS SITE

new version of WinAmp that will support a payment system called Mjuice developed by

Audio Explosion. Both companies are keen to show their support of the SDMI and any imminent standard developed to protect artists. WinAmp has 10 million users and a million copies are downloaded each month.

Another approach is taken in a new format called a2b, a version of MPEG-2 AAC (*see opposite*) which uses public key cryptology to enable files to be played readily only by the purchaser.

Last summer's inaugural MP3 summit was a turning point, with many software and hardware products being shown for the first time. Legal and financial issues will be the hot topics at this year's summit in San Diego on 15th-16th June.

Although sites such as [www.mp3.com](http://www.mp3.com) offer MP3 music for free, normal copyright rules apply and the music is supposed to be for personal use only. Performers do not always have the right to distribute their work if the copyright covers the recording as well as the composition. There were similar fears about home-taping of music, and these turned out not to be justified. But it remains an open question whether the improved quality of MP3 really indicates a brighter future for music.

## Diamond geezers champion MP3

**D**iamond Multimedia, one of the first to truly champion MP3, pursued the mass consumer market with its Rio PMP300 portable music player, currently capable of 60 minutes of MP3 audio playback.

The Recording Industry Association of America (RIAA) (*see above*) claims the Rio violates America's 1992 Audio Home Recording Act.

Diamond counterclaims violations of antitrust laws but it has voluntarily prevented 'serial copying' from the Rio, so that it cannot be used to pass pirated music on to other devices.

Hilary Rosen, president of the RIAA, told the *Wall Street Journal*: 'Diamond is ... jumping the gun to exploit the pirate market instead of waiting and working toward the legitimate market.'

Diamond, which faces punitive

damages claims, has elected for jury trial. No date has been set.

Germany-based Pontis has launched Mplayer3, which takes two memory cards of up to 128Mb providing up to four hours of music with none of the degradation associated with tapes.

Korean companies have bundled MP3 into organisers (not yet available in Europe). Varo Vision's KlikMan also allows digital voice recording and uses Iomega's Klik! drive taking coin-sized 40Mb disks.

DigitalWay's Mpio acts as a telephone and a digital camera, and Koreu Media's Mp-Cap lets you view lyrics to MP3 songs, doubling as a mini-karaoke machine.

For serious audiophiles, Amac's HanSori offers audio frequency controls, mega bass support and FM/AM radio. It has yet to ship.

## Lotus blossoms out

*James Lovell, the astronaut, was telling of the Apollo 13 moon mission which went wrong. It was an old man's story, honed by years of repetition, and he told it well. 'I put my thumb up, like this,' he said, looking along his outstretched arm. 'Just like Tom Hanks did in the movie — I told him about it — I put my thumb up and it covered the world. Everything down there. All those people. Covered with my thumb. I did not expect it to affect me but it did.' He nearly had me in tears, as I am a sucker for this Final Frontier stuff. And I wasn't the only one. There was frequent applause as he told how mission control and the three stranded astronauts got their crippled craft safely to earth. 'It was teamwork,' he concluded. 'And you know... if we'd had Lotus Notes to help us work together, I reckon we'd have got down a lot quicker.'*

Lotus is feeling a little hurt and rejected in a Microsoft-dominated world, and is paying a fortune to get noticed. Buying the endorsement of one of America's greatest living heroes (you have to die to get that kind of respect in Britain) is part of a £120m marketing campaign extolling the 'superhuman' qualities of the latest release of Lotus Notes.

Notes is a collaborative working environment with facilities for messaging and what Lotus now calls 'knowledge management'. Lotus claims Notes has 34 million users and the number is rising. It is one of the few major office products holding its own against the Microsoft tide.

The new Release 5 (which we will review next month) is a mega-revamp on the scale of Windows 95 over Windows 3.x. Reactions to the beta version (at [www.lotus.com](http://www.lotus.com)) have been favourable. Also like Windows 95, its launch has been delayed — at last count until about the time this issue of PCW hits the shelves. Like Windows 98, it incorporates a browser.

Lotus, like Microsoft, was caught off-balance by the web explosion. The increasing popularity of intranets using web protocols to navigate internal networks made Notes look dated overnight. One Lotus executive described this as 'a near death experience'.

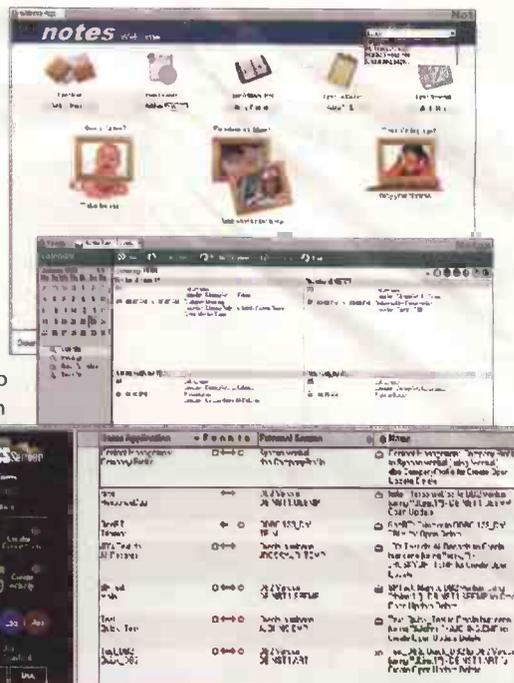
Lotus' response was Domino, a version of its server software which allows information held by Notes to be accessed by a browser. It was something of a work-around: web access bolted on to an alien architecture.

Release 5.0 with the Domino R5 server has been rebuilt from the ground up, around web protocols. You can access all functions via a browser by downloading Java applets, whereas you would normally use a dedicated R5 client holding all the necessary software locally. There is also support for access by information appliances running Windows CE and (using Psion software) Epc32. Search facilities have been

boosted to cover multiple information sources, including the web, and a Headliner function posts regular updates from monitored databases and sites.

A last minute addition called SameTime brings a kind of 'virtual presence' to Notes. It lists everyone available on the network and lets you 'converse' with them in real time as well as synchronously via email. This makes the network similar to a room full of people, some with their backs to you and others smiling a welcome.

There is something slightly chilling about all this as linked computers map,



▲ FROM THE TOP: NOTES' NEW WELCOME SCREEN, NEW CALENDAR SCREEN, AND DOMINO'S ADMINISTRATION SCREEN

mediate and extend complex human interactions. But there is little or nothing in Notes that cannot be done with

the judicious use of rival applications. Lotus rightly points out that it is the integration of these facilities that makes Notes special.

There is another reason. Consider Microsoft's latest figures [p30]: \$6.36bn profit on a revenue of \$16.6bn last year, a margin of nearly 40 percent. IBM made much the same, \$6.3bn, but on a revenue of \$81.7bn. I repeat: \$81.7 billion, nearly five times that of Microsoft. This huge turnover gives IBM massive global clout, and software can help boost its relatively modest 7.7 percent profits. IBM owns Lotus and will be pushing Notes hard to its corporate clients, so Microsoft will have to fight hard to hold its corner in lucrative office software.

**Clive Akass reports from the Lotusphere conference, Florida**

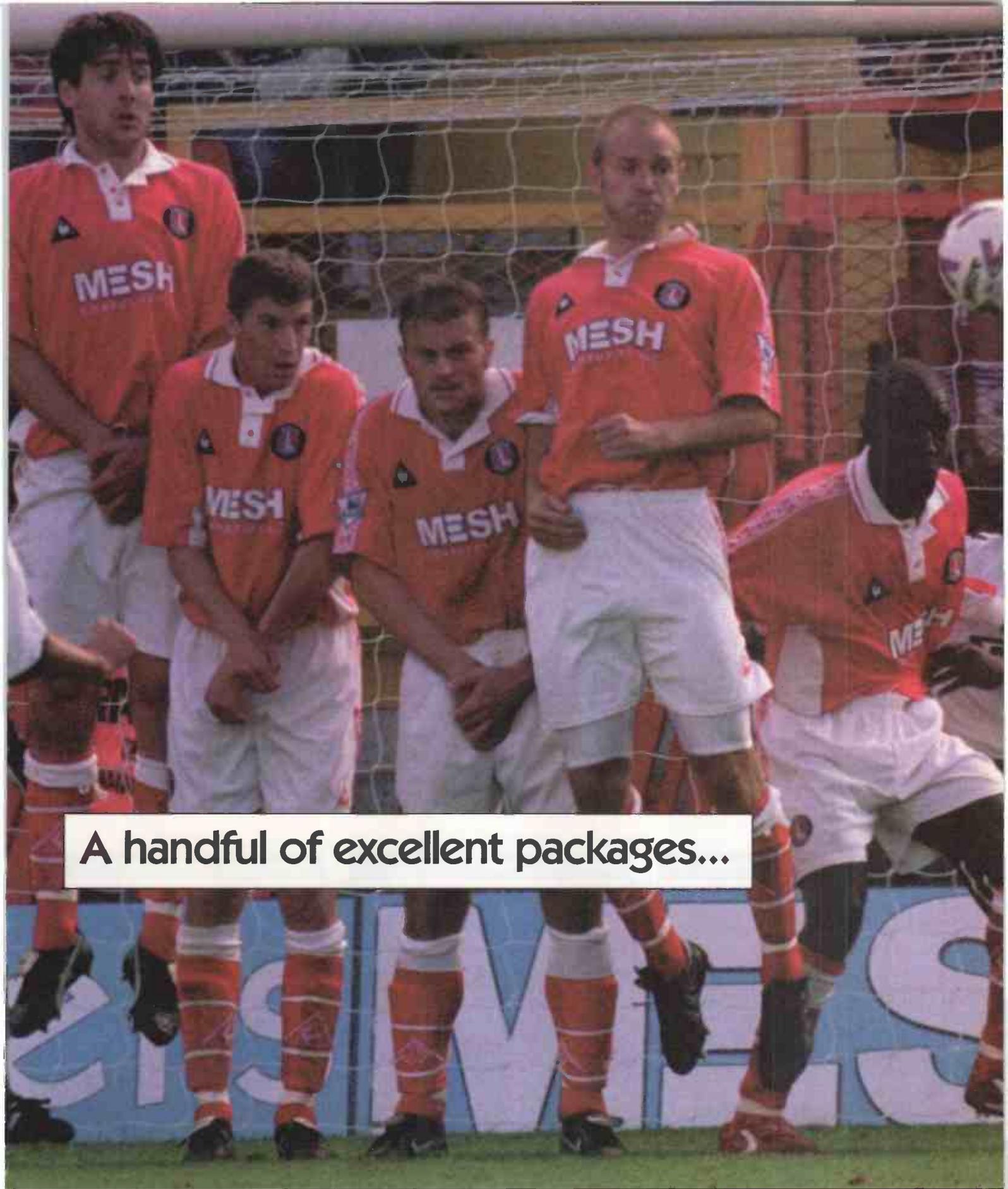
### What's new in Domino R5?

- **New client features** include: an enhanced navigation bar, bookmarks and tabs facilitate information tracking, a group calendar, and document libraries with workflow that integrates with Lotus SmartSuite and Microsoft Office. Lotus also claims to have boosted SmartSuite's compatibility with Office.
- **The R5 server** supports databases of up to 64Gb and six times more

simultaneous users than Notes 4.6x. Administration, searching and security have been improved.

➤ **Domino R5** also works with Domino.doc, Lotus' popular bolt-on document management system.

➤ **A bundled utility** called FastSite, which can convert batches of standard documents for web viewing, is available separately and can be downloaded from [www.lotus.com](http://www.lotus.com).



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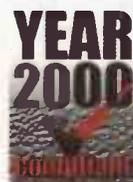
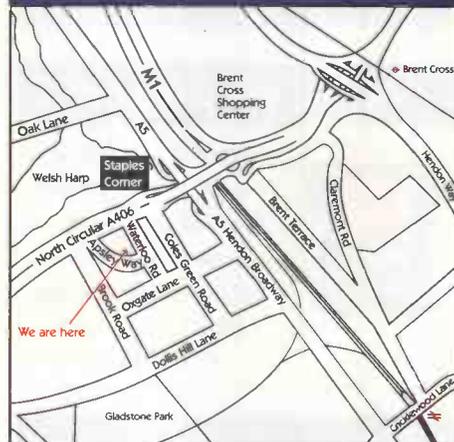
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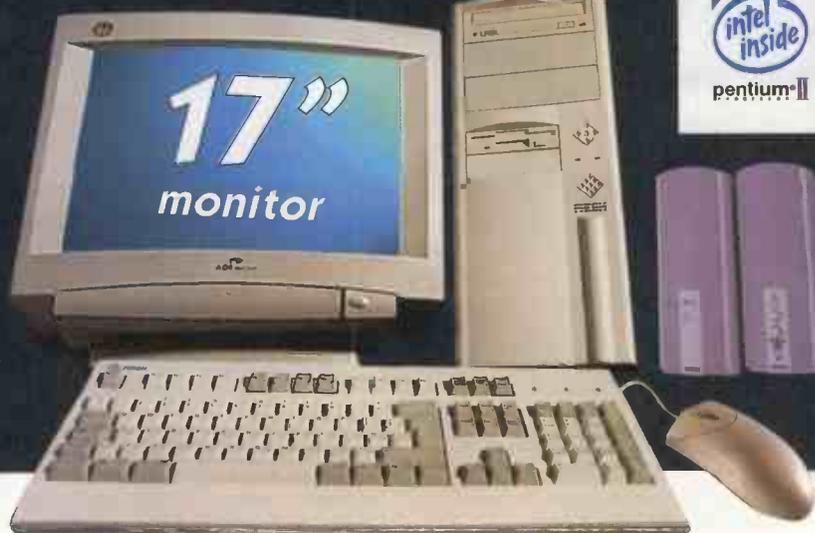
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- ♦ 13Gb ATA66 Hard Disk Drive
- ♦ 17" ADI 5GT .25mm TCO95 Monitor
- ♦ 8MB AGP Matrox G200 SD Graphics
- ♦ Creative Labs PCI Audio 64V
- ♦ Yamaha YST-M20 DSP Speakers
- ♦ 56kbps Diamond SupraExpress modem
- or BT ISDN card (please specify - add £29+VAT)
- ♦ FreeUK Internet and E-mail
- ♦ New Web Cruiser Mouse
- ♦ Lotus SmartSuite 97, Windows 98



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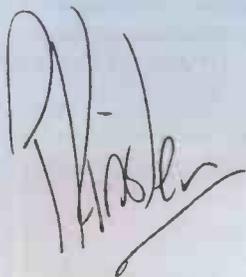
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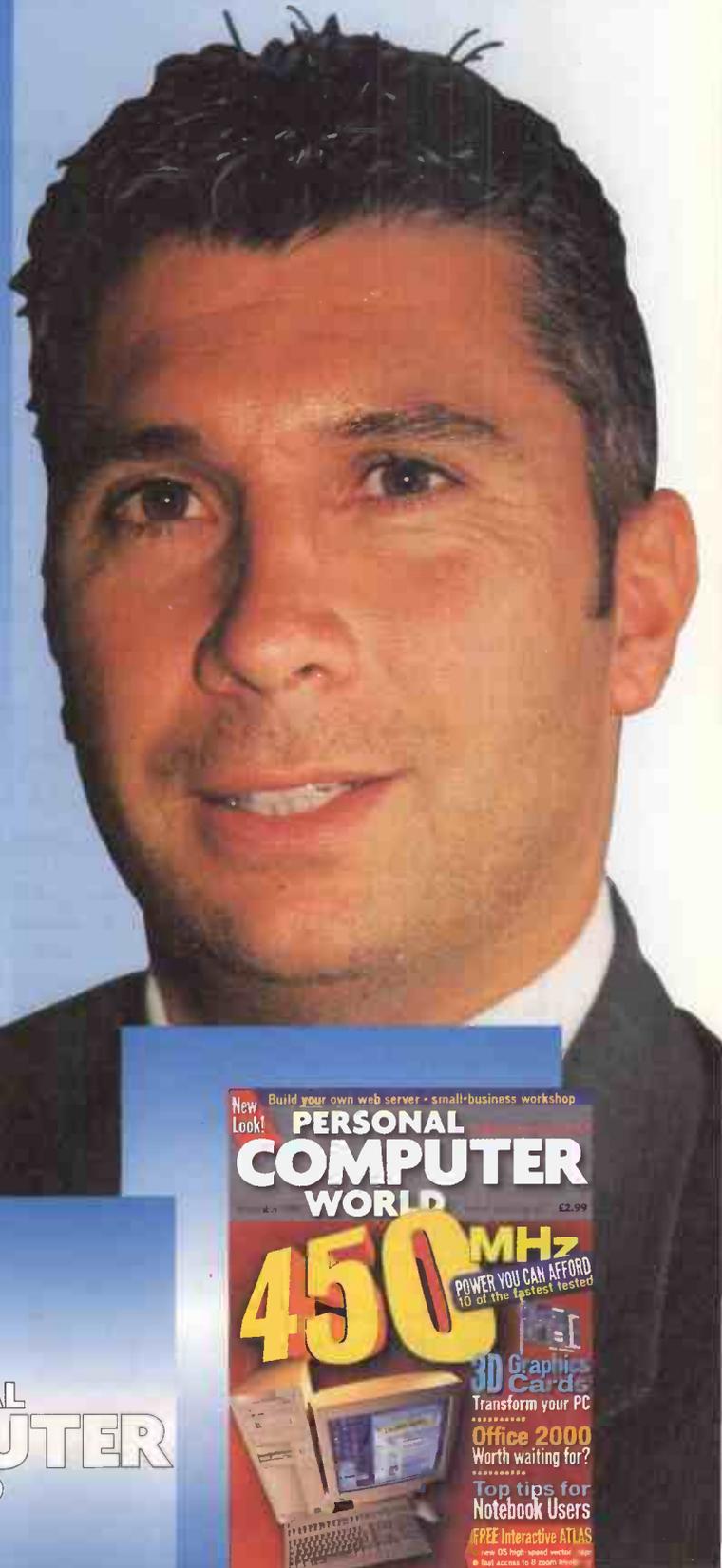
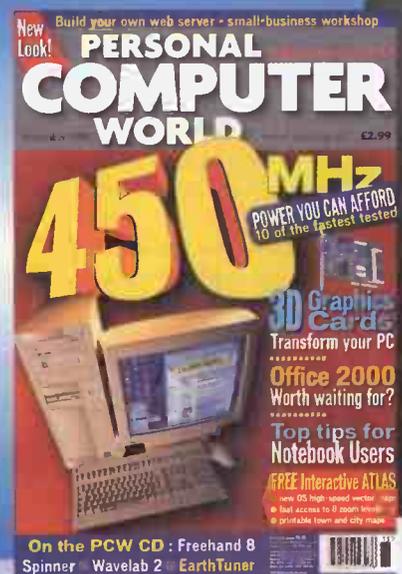
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**Paul Kinsler**  
General Manager  
MESH Computers plc

PERSONAL  
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WORLD



## Thoroughly modern modems

Mid-band means much more than a faster version of what we have — **this thing will change lives.**

**F**irst, the bad news. ADSL and cable modems will not provide an instant end to the 'world wide wait'. Any connection is only as fast as the slowest point in the link, and web hold-ups are as likely to be caused by an overloaded server as by a poor line. Faster access is already exposing deficiencies in the web infrastructure and the situation is likely to get worse before it gets better.

I got transient download speeds of up to 320Kbps from the open web on my nominal 2Mbit pilot link from Virgin Net — about the maximum data rate I get on

my Eutelsat/Easynet satellite link, which is rated at about a fifth of the speed. In both

cases the usual download data rate hovers around 80Kbps, faster than a 56K modem but nothing like the rated speed of the links. Prices of systems which guarantee bandwidth (see panel, below) are likely to fall but the principle of paying more for quality of service will surely persist.

Nevertheless, the new relatively cheap **mid-band services** (data rates between 64Kbit and 2Mbps) will transform the use of the internet. There are several reasons for this:

➤ **Local caching.** Popular content is stashed on a local server which can deliver at the maximum speed, which is how acceptable video can be delivered.

➤ **Commercial benefits.** Caching servers are in effect local portals and

promise a near-captive market. Infrastructure owners like them because they cut line use. The trick is to work out what to cache where in order to minimise loads.

➤ **Fast upstream.** The A in ADSL stands for asymmetric: sending data is slower, 'only' 256Kbps, although still nominally four times faster than a single ISDN line. Again, speeds are limited by the slowest link but applications such as videophones and remote surveillance are viable.

➤ **Multiple streams.** The fact that you can drag only two bits a minute from that server in Timbuktoo doesn't prevent you

having other windows open. You can listen to music, check out BBC Online

or play a video game with your friend down the road, complete with a voice-over-IP speech link, while you're waiting.

➤ **Always-on.** This feature makes the new links far more than a faster version of what we have already. Much web activity that at present is little more than a technology demonstration, particularly for the UK, suddenly becomes viable.

Free local calls have meant US users have long been able to afford to stay online to listen to music, download a magazine or watch a video clip. Always-on will bring the same convenience and more to UK users — provided vendors do not impose per-megabyte charges, which seems unlikely.

Always-on also facilitates teleworking, as your home PC can join your office

network. It makes sense of what Microsoft tried to do with Windows 98, setting it up as a window on the web with channels of data. But so much becomes possible that all current interfaces seem inadequate, and this is likely to become a lively area of development.

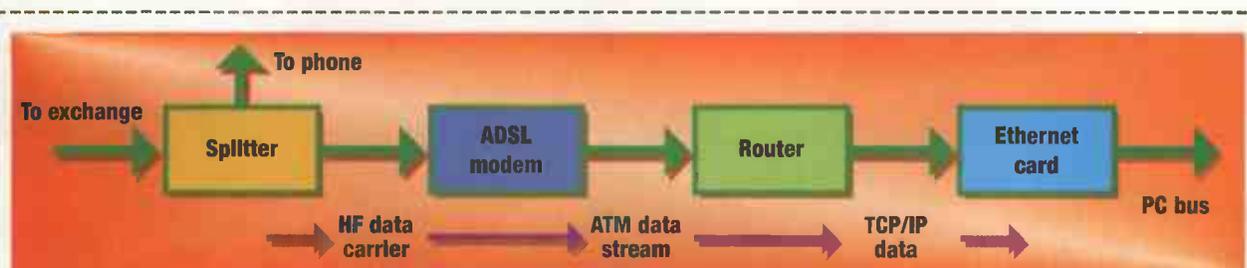
Data will arrive like electricity, taken for granted and spreading the use of home networks way beyond Geeksville. You will access your email or read an online magazine over breakfast, or look up a recipe from the kitchen.

Home web sites also become viable, although business sites will need servers which can cope with the high traffic. Security is a thorny issue: your host PC is open to the outside world and you will need your own private firewall.

The phrase used most often about the web is chicken and egg: you won't get the punters until you get the content, and vice versa. Free web provision and digital TV, with its net-linked set-top boxes, will help square this circle. So will fast links, although prices will have to fall before they become a mass medium. But fall they will. Advertisers will finance content and engender e-trade which is likely eventually to make a basic, fast link free — to the extent, that is, that the use of our roads is free. The highway analogy may be old but it is almost exact.

**We are on the brink** of great changes: arguably, the advent of ADSL and cable modems is second only to the birth of the browser as the most important event in IT since the launch of the IBM PC.

*...the most important event in IT since the launch of the IBM PC*



ADSL data goes through no less than four devices before it reaches your PC proper: first to a **splitter**, which filters out the audio voice signal and sends it to your phone, which is unaffected by ADSL use. The high-frequency (up to 1MHz) signal passes to an **ADSL modem** which strips out the data

— or vice versa in the reverse direction — as an ATM (Asynchronous Transfer Mode) stream. A **router** takes the ATM and passes the signal as TCP/IP to a standard **ethernet card** on the PC. These devices are likely to be combined if this setup hits the mass market.

## WHO'S WHO

A hyperlinked version of this list is at [www.pcmag.co.uk](http://www.pcmag.co.uk)

**NTL, TELEWEST AND CABLE & WIRELESS** between them own just about all Britain's cable networks. All have plans to deploy cable modems; NTL is further ahead (at least, it's talking the loudest).

**KINGSTON COMMUNICATIONS** has just announced that it is launching an ADSL service in Hull, the one area where BT never owned a phone monopoly.

*Piloting ADSL in London are:*

**BT INTERACTIVE** which has been experimenting with services that exploit the new bandwidth to the full. It is charging trialists £30 a month.

**VIDEO NETWORKS** has been running a pilot video-on-demand scheme in Hull for two years, with other services such as interactive shopping. It is also looking to provide content for cable services.

**I-WAY** is targeting its trials and charges (£300 a month) at businesses rather than homes.

**VIRGIN NET** has a foot in both ADSL and cable — it will provide content. NTL's cable marketing director, Alex Dale, expects content initially to be similar to today's but with richer graphics.

# Cable lengths

If you think ADSL looks good, take a look at **cable modems...**

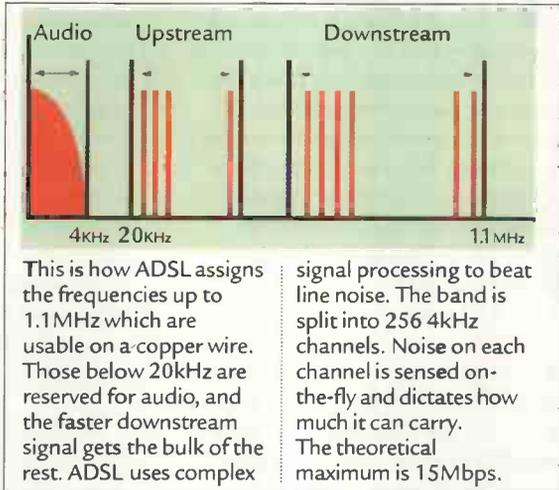
**A**nalysts are divided about whether ADSL or cable will win the most users. In the short term, people will probably go for whichever one reaches their area first.

BT's links spread widest. At first sight ADSL has the edge on speed, offering 2Mbps downstream and 256Kbps up, no matter how many people are online. BT may yet go for a cheaper system called DSL Lite, which dispenses with a home splitter. DSL Lite modems could be bought and installed by users, just like today's audio modems.

**DSL Lite** would be slower — less than 1.5Mbps — although still nominally faster than the 256Kbps NTL (see 'Who's Who', left) cites for its cable service. But NTL, in an industry addicted to hype, is being unusually modest: 256Kbits in either direction is the *minimum* speed you can expect.

Cable works like a local network: you share the bandwidth with whoever is on your loop. With no-one else on-line, a theoretical 27Mbps can be delivered. The bottleneck then is in your PC: as with ADSL, the data is piped to an ethernet card which can handle only about 3Mbps. Eventually though, combined cable modem and ethernet cards sitting direct on the PC's data bus could speed this up.

Stephen Temple, director of traffic development at NTL, sees no problem in these rates overloading the backbone. 'We are constantly upgrading our national fibre capacity,' he said. One way of doing this, called 'wave division multiplexing', uses channels of different frequencies, much like ADSL. Temple points out that, unlike in the US, cable companies are also phone companies. 'We could also offer ADSL...in fact we can do it more easily than BT, which



has only one copper pair [of wires] going to each home. We have two. BT has to use a splitter to separate the signals. We wouldn't need to because we could use the second line.'

In about one month's time, NTL will announce when and where it will roll out its service. The most it will say about charges is that they will be flat rate and that users will have to buy their own modem — initially, until standards mature, only from 3Com.

**Cable looks more versatile** than ADSL. 'On our coaxial cables we have an enormous range of frequencies broken up into 8Mb channels,' Temple says. 'A lot of those are already supporting our 40 analogue TV channels. Another lot, 15 or 18, will be carrying digital TV later this year. And we have one or two frequencies for cable modems.'

Compare that to Video Networks, which is pumping video to homes at ADSL's top-rate 2Mbps, using a combination of MPEG1 and 2 compression. Marketing director Mark Springett indignantly denies that this affects quality, which he says is indistinguishable from the TV. And remember, he is providing video to order, not to schedule.

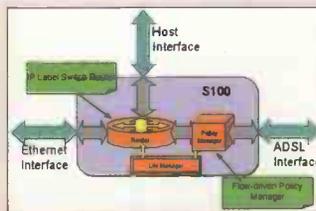
**NTL sees modems and TV as**

serving different markets — what Temple calls the living room and the study. But as interactivity increases and inefficient analogue TV fades away, it is hard to see things staying that simple. We have not begun to explore the synergy between all those channels when you hook them up to computers. And if that stirs your imagination, consider that a Sun white paper predicts home links of more than 70Mbps within 20 years.

## Quality-assured links

At least one company is offering a premium ADSL service nationwide, now. Exactly how is not clear, as Edge Technologies will not yet say who will provide its local links, but its plans show the way ADSL may go. Its charges are on a par with those of leased lines,

starting at a hefty £500 or so a month. But by a mix of ATM and ADSL trickery it can offer different levels of service, including guaranteed end-to-end bandwidth. And it uses a single PCI interface card (right) from Oxford-based Xstreamis, which can



dictate, on-the-fly, the service level for a particular packet: email, for instance, does not need a continuous stream.

## Merger mania: the view from 3Dfx

**T**he merger of 3Dfx Interactive and STB Systems (see last month's News) is only one of the latest moves in a consolidation of the PC graphics industry. Just a few years ago there were more than 30 chipset designers and twice as many board manufacturers. Today, there are fewer than five major chipset manufacturers and the trend, as with 3Dfx, is for these to merge with board makers.

To discuss the ramifications of this, PCW's AJITH RAM met up with Greg Ballard (pictured, right), CEO of 3Dfx. Bespectacled and with a thick shock of grey hair, Ballard looks anything but the CEO of a company revered by inveterate PC gamers around the world.

➤ *What was the reasoning behind your merger with STB?*

The main reason was to become a complete graphics solution provider for the high-volume OEM market. It also helps us to focus our development efforts. Our competitors, like nVidia, have to cater to a variety of board manufacturers such as Creative Labs and Diamond Multimedia.

➤ *But until this merger 3Dfx, too, had to provide the same kind of support to several vendors. Is this a big disadvantage?* Supporting a varied customer base places a great deal of strain on in-house resources. The needs of OEMs differ greatly. In a crowded market, everyone tries to distinguish themselves through changes to the board design or drivers.

This often leads to unpredictable problems which need to be solved quickly. With this merger, all our engineering and driver development efforts can be focused on refining one product.

➤ *The OEM market [that is, selling components for new machines] is a high-volume segment.*

*To compete with the main players in this market you need to be able to produce your hardware in huge numbers. Do you think STB's manufacturing facilities can cope with the demand?*

We are confident that we will be able to satisfy demand. Currently we are in discussion with some manufacturers, such as Guillemot, for additional support but this is mainly for Europe. In the US, the niche workstation market will be catered for by Quantum which will continue to use our chipsets.

➤ *More than 50 percent of your Voodoo2 sales last year went to Creative Labs and Diamond Multimedia. With the merger,*



*they will no longer be supporting you. Don't you think this will adversely affect sales of your upcoming Voodoo3 cards?*

We are convinced that most people bought Voodoo2 boards due to 3Dfx's reputation for quality and performance.

▼ **THE VODOO3 CHIP FROM 3DFX, WHICH, SAYS BALLARD, OFFERS THE 'BEST PERFORMANCE' FOR THE PRICE**



Therefore, sales of Voodoo3 will continue to be equally strong.

➤ *This reputation for quality has taken a hit recently. Voodoo3 will not support features like 32-bit rendering and stencil buffer, which are provided by your rivals. Don't you think you have some catching up to do?*

We believe that the Voodoo3 offers the best performance at a price which others will find hard to match. These features will be supported in our next-generation chipsets when we are certain that there is no performance hit.

### Savage chip for quad-speed bus

**A** new graphics chipset, Savage 4, has been launched by S3 to support Intel's soon-to-be-released quad-speed 4X AGP bus. It is based on the Savage 3D architecture and is compatible with the AGP 2X standard. It is also the first chipset with four texturing pipelines. Unlike competing chipsets such as TNT

and Voodoo2, Savage 4 can perform multitexturing and trilinear filtering simultaneously without affecting performance. S3 also announced losses of more than \$70m for last year, attributed to the poor sales of Savage 3D. S3 claims that major PC makers have shown tremendous interest in Savage 4.

### 'Screen rivals paper'

IBM researchers claim to have developed a screen of such fine definition that it is indistinguishable from a printed page. The prototype has a pixel density of 200 to the inch, which is up to four times that of a cathode-ray tube.

The first production models of the active-matrix displays are likely to cost more than £3,000 and will be sold into niche markets such as CAD. But prices will fall with volume production, says IBM.

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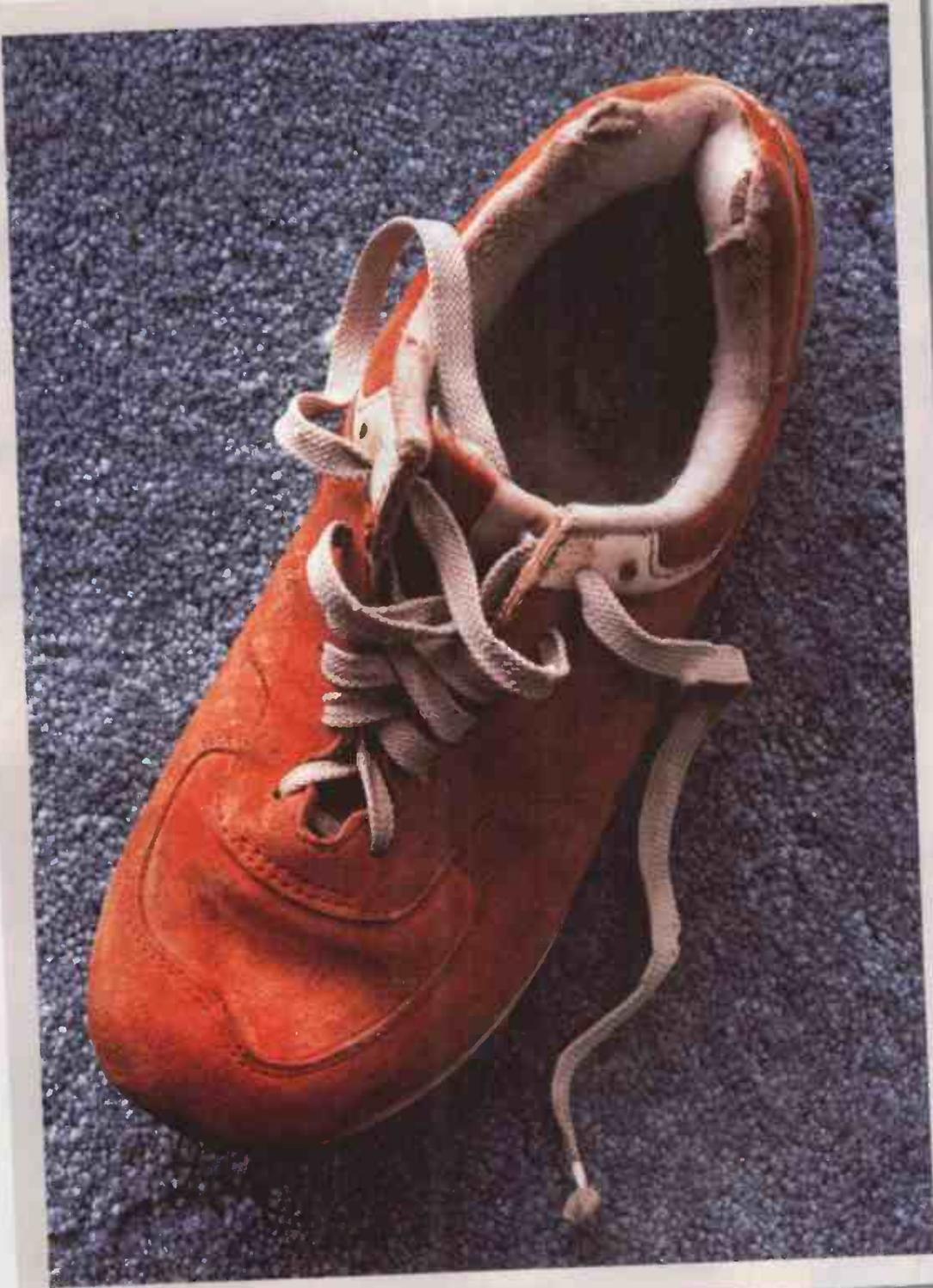
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See insert between page 228-229 for details

## GAMES NEWS

# City limits expanded in latest 3000 version



**G**ood news for fans of SimCity and Worms: new versions of each of these games will be hitting the shops soon.

**SimCity 3000** has advanced immensely. As well as being able to construct an entire city and manage everything from budgets to bulldozers, taxes to tornadoes, players can also build real landmarks such as the Empire State Building, the White House and Big Ben.

**Worms: Armageddon** will see Worms as we know them going out with a bang! This award-winning game has been enhanced with new weapons such as an electron bomb, a flame thrower and a skunk. There are also much improved multi- and single-player gaming modes.

Codemasters will soon be bringing the WBO featherweight champion, Prince Naseem Hamed, to the PC. In **Prince Naseem Boxing**, players control Naseem and 15 other world-class boxers. The Prince's character has been modelled from 800 polygons and every move has been hand-animated to reproduce his dynamic boxing style. Expected release date is Spring 1999.

Interactive Magic has released details of its new 3D game, an all-action

first-person shooter called **Mortyr**. It begins in the latter stages

of World War II, but this is a version of the war where Germany wins a decisive victory over the allies. Mortyr is graphically rich and sets a new level of combat realism, maintaining its tense and vicious plot until the bitter end. The player controls a character called Jurgen Mortyr who has to prevent the entire world from falling into a Nazi-dominated future. Mortyr is out at the end of March, priced at £39.99.

• *In Screenplay this month (starting on page 281) we have reviewed Gangsters, Populous: The Beginning, Settlers III, Half Life, Grim Fandango and Star Wars: Rogue Squadron.*

**▲ YOUR KIND OF TOWN? SIMCITY 3000 IS A MORE ADVANCED GAME THAN PREVIOUS VERSIONS**

## Scots triumph

Scotland beat England and Wales in a Settlers III international battle in London last month. It was organised by BT Wireplay, which offers a variety of games at [www.wireplay.com](http://www.wireplay.com), and Blue Byte software <[www.bluebyte.com/uk/index.htm](http://www.bluebyte.com/uk/index.htm)>.

## Top 10 products Last month

### Peripherals

1	Dynamode 56K PCI Modem	DYNA	2
2	3COM 56K V90 Voice/FX Ext	3COM	6
3	SoundBlaster PC128 PCI	Creative	12
4	SoundBlaster Live! Value PCI	Creative	8
5	DSC-F1 digital camera	Sony	5
6	Typhoon Gold Wave 3D ISA	Typhoon	-
7	SoundBlaster Live PCI	Creative	17
8	Astra 1220S flatbed scanner	Umax	21
9	3COM 56K Message Modem	3COM	-
10	P75 to P200MMX	Evergreen	19

### Windows software

1	Free Access Starter Kit	SWWH	1
2	SoftNet Gold Starter Pack	SWWH	-
3	Windows 98 U/G CD	Microsoft	5
4	Comptons Complete Ref.	Learning	18
5	Partition Magic 4.0 U/G	POW	6
6	Office Pro 97 + Books U/G	Microsoft	7
7	Norton Anti-Virus v5 STD	Symantec	14
8	Office 97 STD version V/Comp	Microsoft	8
9	Norton Systemworks v1	Symantec	9
10	Encarta Ref Suite 99	Microsoft	2

### DOS software

1	Turbo Pascal v7 DOS Educ	Inprise	1
2	Turbo Pascal v7	Inprise	3
3	NetWare v5 Server + 5 UR	Novell	-
4	Oracle 7 Workgrp Svr + 5UR	Novell	-
5	NetWare 4.2 Svr + 5CLT	Novell	-
6	SuperCalc V5.5 for DOS	CA	-
7	Norton Command v5	Symantec	-
8	NetWare 4.2 50 User	Novell	-
9	IBM PC DOS v7	IBM	4
10	DOS 2 Win95 U/G with IE4	Microsoft	-

### CD-ROMs

1	South Park Desktop Themes	Telstar	1
2	Simpsons: Cartoon Studio	Fox Int.	4
3	Simpsons: Virtual Springfield	Fox Int.	2
4	Dancing Baby Screensaver	Jellyfish	5
5	James Cameron's Titanic Exp.	Fox Int.	6
6	Star Wars: Behind The Magic	Lucas Arts	2
7	Dancing Baby CD Player	Jellyfish	7
8	Dance EJay	Fast Trak	10
9	Rave EJay	Fast Trak	-
10	Hip Hop EJay	Fast Trak	-

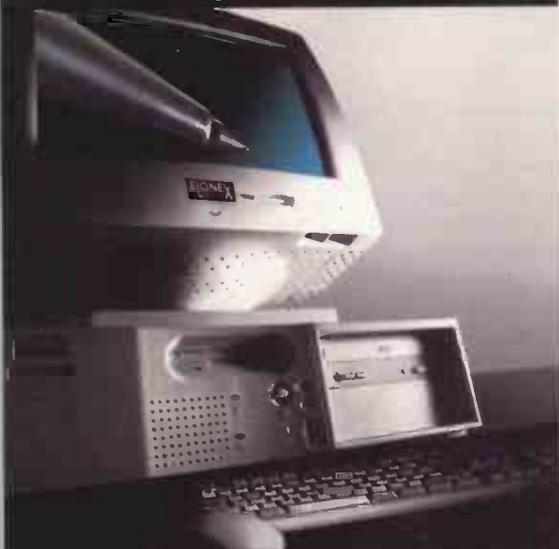
### Games

1	Worms: Armageddon	Hasbro	-
2	Baldur's Gate	Interplay	-
3	Worms	[sold out]	-
4	Starcraft: Brood Wars	Havas Int.	-
5	Simpsons: Virtual Springfield	Fox Int.	6
6	Half Life	Sierra	4
7	Grand Theft Auto	Take 2	-
8	Cannon Fodder	[sold out]	-
9	Biggest Names Best Games	E.A.	-
10	Warcraft	[sold out]	-

Games and CD-ROM figures supplied by HMV. Others from Software Warehouse.

# POWERFUL

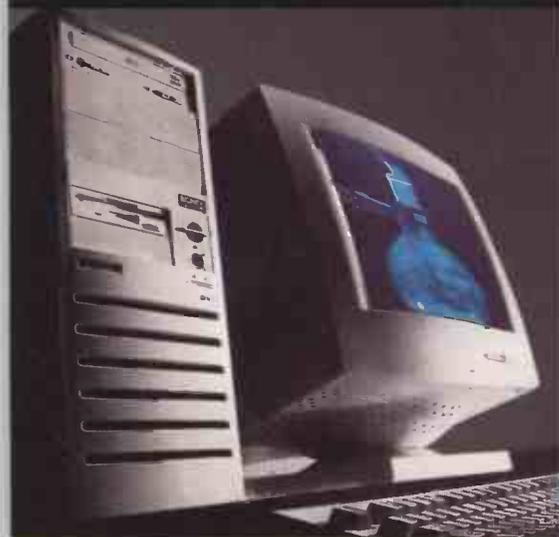
## Low profile desktop



## Mini tower desktop



## Workstation



## PC - 6400N / I

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- 128KB cache
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- ATI Xpert98 AGP 2X 8MB SDRAM
- On board 16-bit PCI audio (Yamaha 740)
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- 15-inch colour monitor
- 1 x ECP/EPP parallel, 2 x 16550A serial, 2 x USB
- Dimensions: 420 x 420 x 115mm (WxDxH)
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- Microsoft Windows 98 pre-loaded

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- On board Intel740™ graphics accelerator with 8MB SDRAM
- On board 16-bit PCI audio (Yamaha 740)
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- 2 x PCI, 1 x PCI/ISA shared slot
- 17-inch colour monitor
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- Dimensions: 420 x 420 x 115mm (WxDxH)
- 105-key Windows 95 UK keyboard, Microsoft Intellimouse
- Intel LANDdesk Client Manager (DMI 2.1) Intel WFM 1.1a
- Advanced bios virus protection
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**£1,175.00** £1,380.63 inc VAT

## MCX - 6333 / I

- Intel® Celeron™ processor 333MHz
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- 64MB SDRAM
- 6.4GB Ultra DMA hard drive
- 36x speed IDE CD-ROM
- Riva 128 AGP with 4MB SGRAM
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- 36x speed IDE CD-ROM
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- Stereo Speakers
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March 1999  
PC Magazine  
Editors Choice

## PTX - 6450 / I

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- 512KB cache
- 128MB SDRAM
- 6.4GB Ultra DMA hard drive
- 36x speed IDE CD-ROM
- ATI Rage 128 GL with 16MB SGRAM
- 3 x PCI, 2 x ISA, 1 x PCI/ISA shared slot
- 15-inch colour monitor
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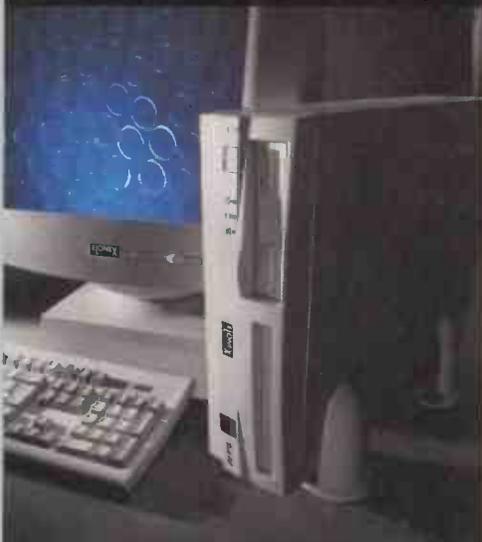


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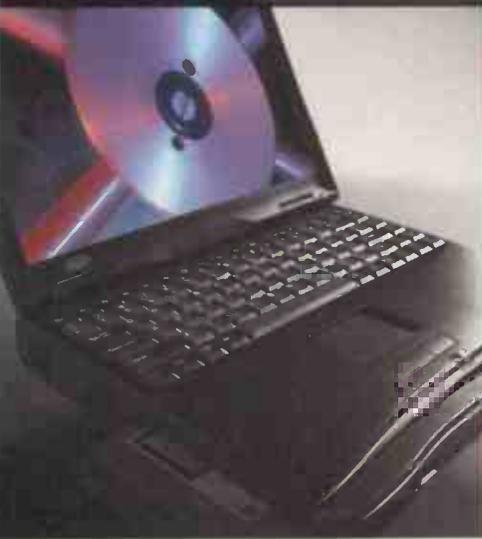


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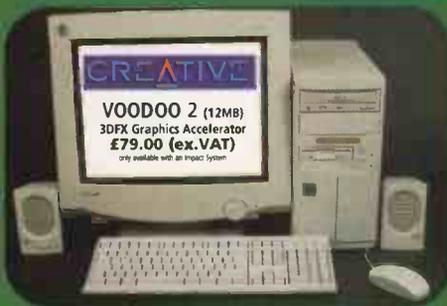
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Michael Hewitt takes on **Arnold Schwarzenegger** armed only with some menacing sheep.

# Ewe'll be sorry, Arnie



Late last year, the broadsheets reported on an Oxford professor who, in response to complaints from bunny-huggers that the use of sheep dogs was cruel because they frightened the sheep, invented a non-threatening robotic herder. It

performed exactly to spec. Indeed, so non-threatening was it, the sheep became positively contemptuous of the thing, and began attacking it. Now it herds ducks.

Which makes me wonder about the Doomsday scenario, as propounded by such as Professor Kevin Warwick, of Reading University. Warwick, you may recall, was interviewed by *PCW* a few months ago. In that piece, he claimed, within our lifetime, a Terminator scenario will occur, whereby computer-controlled robots will subjugate humanity and take over the world. Those of us who survive, it seems, will be castrated, lobotomised, and forced to live like battery hens, albeit without the happy prospect of ending up as a self-basting product in Waitrose.

**Question, though:** why should a computer want to divest us of our gonads and take over the world? I've used quite a few software suites in my time, and none of them has shown the slightest inclination to enslave or attack me. OK, I've had the occasional argument with a spellchecker, but none that wasn't settled amicably. And, as far as I'm aware, few existing computer programs contain an 'Off with his goolies/lobotomise him' sub-routine. So it would require a human programmer to incorporate this into his world domination software. But even if that program came free on a cover CD, would anyone want to run it?

True, Warwick suggests that human intervention might not actually be necessary. He says that, as computers become more sophisticated, they'll eventually become both conscious and, ultimately, more intelligent than humans. It's when they're conscious and exceed us in intelligence, and they're connected to an ultra-sophisticated network, that the ordure apparently hits the fan. Because hanging off this network will be computer-controlled robotic devices, including pilotless warplanes, tanks, and 'intelligent' nuclear bombs. The crunch point comes when a computer operator with an

IQ of 150 tells a computer with an IQ of 250, to, for instance, download a nude picture of Jennifer Aniston from the internet. 'Sod that,' says the computer, 'I'd rather download a tasteful .gif of a bare circuit-board instead.' 'Who's the boss here?' asks the operator, 'you or me?' The computer thinks for a nanosecond, then, via its network, instructs all peripheral computers and their robotic devices to wipe out humanity, retaining just a few for menial tasks. Then it downloads its .gif.

**On the face of it,** it makes a little sense. How would you react, if a chicken came along and started clucking orders at you? Probably a certain amused indulgence initially. But you'd eventually reach for the Paxo.

I've two problems with this, though. The first is Warwick supposes, in acquiring intelligence and consciousness, the computers will acquire negative human traits, too, such as hatred, paranoia, and ambition. But surely that's like saying they could acquire a taste for kebabs, isn't it? Logically, they can't. The liking for kebabs is a purely human thing (and even then it isn't universal), in the same way that hate, paranoia, and ambition are. They couldn't ever be facets of a

**As computers become more sophisticated, they'll eventually become both CONSCIOUS AND MORE INTELLIGENT than humans**

computer mind, even the most sophisticated.

**But my main objection** to the Doomsday scenario is simply this: before they develop a machine that's as intelligent as an average human, inevitably they're going to develop one that isn't quite. Any latent Armageddon-unleashing instincts should be observable at this stage, while the machine is still too thick to stop its plug being pulled. We'll therefore be able to build in failsafe measures which can be incorporated into the more advanced models. So fear not. In any case, given the fate of the robotic sheep-herder, I'd say Warwick's being a tad pessimistic. If a 6ft 3 cyborg with an Austrian accent does put in an appearance in the near future, a couple of bad-tempered ewes should be enough to see him off.

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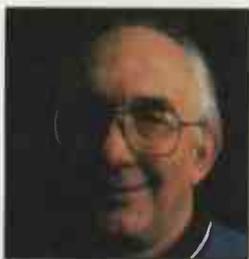
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CompuServe accounts are still being targeted by **unscrupulous scammers**, says Barry Fox.

# Prime targets



If anyone has lost money after falling for the scam messages being delivered to some CompuServe email addresses, one thing is certain — the UK company's MD, Martin Turner, cannot plead ignorance of what's been going on. I have a

pile of readers' war stories from which a clear pattern emerges. Anyone who takes up a free trial on CompuServe may receive a very cleverly worded message, shortly after getting an address. But it's not bona fide.

**They all read** in much the same way. It reports a 'problem with your account', claims to be signed by CompuServe's 'Account Manager', and looks like an official communication. It claims either the new user didn't fill out the sign-up form correctly, the information received was corrupted, or the subscriber's bank didn't reply correctly to CompuServe's billing.

'To continue using CompuServe you should fill in the following form,' it says. This asks for name, address and credit card details, bank name, telephone number and email password. Only the names of the 'account manager' change, and so do the addresses for reply.

The scammers have tried different tacks — sending messages full of impressive jargon about CS-29.X2 transfer protocols giving increased connection

speed if the CompuServe user returned a form which agreed to pay \$5 and required full banking details. This was allegedly signed 'CompuServe Technical Support Team'. CompuServe users seem to be prime targets for these scams because the network's address system is based on numbers rather than names.

**CompuServe's support line** tells those who call for advice that they're aware of the problem. But still it goes on. If you fear you've been caught, don't delete the message as CompuServe suggests. Keep it in case you need evidence of how you were scammed.

'Thanks for your article,' writes someone who got a message after a couple of days. 'I might well have been taken in had I not read it.'

I got nervous when I received a message from CompuServe telling me that my credit card was due to expire soon and I had to send fresh details. I can only

hope it was a genuine request.

'I had a new PC delivered yesterday,' writes another new user. 'By early this morning I'd received a message claiming to be from CompuServe asking for my billing details. If it hadn't been for your article I'd have definitely sent them, being none the wiser. Thank you.'

**I first asked CompuServe** to comment on all this last October. I've sent many faxes to Martin Turner, Konrad Hilbers, Executive VP of CompuServe Europe, and Mayo Stuntz, President of CompuServe in the USA.

By mid-January, I'd heard nothing directly from anyone. But Turner found time to write a letter for publication assuring that CompuServe 'takes the most stringent measures... and very few such messages ever reach members'.

Turner also found time to send a Christmas greeting email to subscribers. It puffed new channels, V.90 access, and CompuServe's 2000 Beta test. Only those who read the whole tedious lot will have seen the standard reminder at the end that 'no-one at CompuServe will ever ask you for your password'.

Is this because a more direct reference to the scams would make poor publicity?

**Anyone who takes up a free trial on CompuServe may receive a VERY CLEVERLY WORDED MESSAGE, shortly after getting an address. But it's not bona fide**

**The only response** I have got, is from the company's legal counsel, Jonty West. 'We are very much aware of the continuing problem,' admits West. 'The use of "urgent" and "problems with your account" messages are a recognised feature of this approach... we are employing specific measures to eliminate the possibility of these requests reaching our new members... we employ extremely sophisticated anti-scramming technology.'

Intelligent networks can weed out offending messages by scanning for key text phrases like 'get rich quick'. So why can't CompuServe scan for the tell-tale words, 'Problem with your account'?

The CompuServe network is obviously intelligent. My own email to Martin Turner was returned, because his address does not receive incoming messages.

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Brian Clegg trod on the **sensitive toes of big business** and learnt not to take a trademark in vain.

# What's in a name?



If there's one thing that businesses guard even more jealously than their secret formulas, it's their trademarks. It sometimes seems crazy. A while ago I wrote a review of some fax software, which I called the R\*\*\*\* R\*\*\*\* (think

big, expensive cars that aren't quite Bentleys) of fax software. The proud software vendor quoted me in their advertising, and were promptly jumped on by R\*\*\*\* R\*\*\*\*. I gather from no less an authority than Bill Bryson in his excellent *Mother Tongue: The English Language* that the said car company has about 500 trademark infringement cases a year.

**When you think why** people use the name, it seems strange that R\*\*\*\* R\*\*\*\* complains. After all, the implication is that its trademark is synonymous with the best of the breed. The trouble is that trademarks are delicate things. If a trademark is used as a common word, it can lose protection. Aspirin, cellophane, escalator, thermos and yo-yo were all trademarks that have become so much part of the language that anyone can use them. Others, like Coke, are used in common speech as if they weren't trademarks. (Coca-Cola found this out to its cost when it employed a well-known Italian actress to advertise their product. Her glowing testimonial went along the lines 'we always drink Coke back home, only there we call it Pepsi-Cola').

I don't think R\*\*\*\* R\*\*\*\* should really worry, because two different processes are at work. A trademark is worthless when it becomes a generic term for a product. You can see this with the examples I already mentioned. Sometimes trademarks even become verbs (the Shorter Oxford Dictionary includes 'hoover', though strangely, Hoover is still a trademark). But you wouldn't call all cars R\*\*\*\* R\*\*\*\*; instead, the term is used to indicate quality and acts as an advertisement. As yet, this phenomenon hasn't crept into the IT world, but it is interesting to speculate what would happen.

**It's up to you** to interpret exactly what they would mean, but I think the English language would benefit considerably from an influx of computing names. A few phrases spring to mind. 'I've been absolutely microsofted.' Or perhaps 'they're the dell of greengrocers'. You might say 'help me out here, I'm in an

absolute ibm', or 'he's doomed to lotus'. Just make sure you don't make a netscape of yourself. Somehow, though, I don't think these companies are in much danger of having their trademarks devalued in this way. I've commented before on the immaturity in this business, and it seems that such popular usage only comes with brand maturity.

**As the web becomes** more and more important to business, it's nice to see that even the pros can slip up occasionally. A certain very large online bookshop which will remain anonymous (think of a long river and strong women) decided it would be a good idea to set up a list server for the publishers it deals with. This is one of those handy email addresses which redistributes mail to lots of recipients. So far so good, but a hapless Amazon (oops) employee sent a test mail to the list server. You could tell it was a test mail, because the subject was that favourite word of random keyboard hitters, 'sdfs'. Also it said 'sfsd - test' in the body text.

Not surprisingly, quite a few of the recipients were puzzled and replied asking what was going on. Unfortunately, being publishers, some were not too sure

**You understand the mechanics of a chain reaction when people who are complaining about receiving UNSOLICITED MESSAGES mail a server which then generates more unsolicited messages**

about technology and many of them hit the 'reply to all' button, rather than just 'reply'. Even so, all should have been well. After all, a professional outfit like A\*\*\*\*n wouldn't have set up a list server that anyone could mail to, would it? You begin to understand the mechanics of a chain reaction when people who are complaining about receiving unsolicited messages mail a server which then generates more unsolicited messages. After over 40 irritated emails had hit the inbox of everyone on the mailing list, they pulled the plug. But it just shows, you have to be careful.

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Paul Smith takes issue with **techno-snobs** and decries shortsightedness in the digital age.

# Hold the FrontPage



I'd like to start this month's column by describing, in joyful and ebullient prose, what a wonderful online month I've had. I would like to tell you about the ways in which the New Year has brought with it such sweet promise. And it

would give me great pleasure to announce all the exciting techno-developments that have kept me on the edge of my mousemat.

**Of course, I can't.** My so-called life being just that — so-called, i.e. tragic — means that I have spent the last few weeks burning the normal amount of rubber getting nowhere. For a start, my web site became somewhat out of date as the, literally, several visitors will have realised. I've now updated the content, removing phrases such as 'Best viewed with NCSA Mosaic' and 'Optimised for colour SVGA'. I've also been using FrontPage 2000 (FP), part of the beta for Office 2000. FP2000 is better than FP98 — although not, as its name might suggest, by a score of 1,902. It has a better interface, more themes and an easier way of creating your own theme.

For those who've never used FP, here's the cool thing about it: it automatically handles all the nav bars between pages in your site, even including the creation of active graphic buttons for those links. Add a page, and all the nav bars are updated automatically. And you can add a 'theme', a set of button graphics, text, colours and background which are all thought, down Redmond-way, to be enticing. Just choose one, and its beauty is instantaneously propagated throughout your web site.

**Having been brought up** on Notepad, 'the HTML editor for *real men*', I rather feel that I'm somehow cheating by using FP. It's just *too easy*. Still, never having practiced donated-equine dentistry, I now use it exactly *because it's too easy*. It's a controversial opinion, but good software should be easy to use, shouldn't it? But its use has uncovered a surprising level of techno-snobbery. About half the emails I get from PCW readers who have come across the site, begin: 'Much as I hate tools like FrontPage...' I'm not yet sure what's wrong with 'tools like FrontPage' or even what that actually means. Like Microsoft products?... like easy to use?... like rigidly imposing certain designs?

I presume it's something to do with the pioneering spirit of the web's illuminators. Me, I think FP is just a start. It can't do things which I think are important. For example, you can't make those nav bars point to bookmarks on the same page. And, while you can have as many fonts as you like in your site, there should be a facility for rendering them into graphics if you're not sure your viewers will have the same fonts. Still, as I write, the site is up to date.

➤ **My other techno-news** has to do with television. Sony lent me one of those 32in Wega widescreen TVs — very cool, very flat. I had it in for review for about a month. Now, this may come as a surprise, but those Sony folks must be short of a TV or two because *they wanted it back!* Which was not nice. So now I've gone to Granada which has, bless it, stumped up a Panasonic widescreen and an OnDigital box.

The TV is a 28in, or what is known in televisual circles as a 'portable'. I then went to see the nice folks at OnDigital down near Battersea Power Station. Apparently, OnDigital, with its limited selection of channels and its simple, dish-less installation, is aimed

**OnDigital is aimed at those who want satellite TV but DON'T WANT THEIR NEIGHBOURS TO REALISE that they want satellite TV**

at those who want satellite TV but don't want their neighbours to *realise* that they want satellite TV; there's something just a bit C2DE about Sky, apparently.

Anyway, the interesting feature of OnDigital is that it has no support for the internet, and none in the works. 'We'll keep an eye on it,' Andrew Marre, the PR bloke at OnDigital tells me, 'but it's not something we see as key at the moment.'

Not key? Here's the planet's biggest communications revolution since sliced bread — bigger, actually, when you consider bread's complete failure as a communications medium — and digital TV offers an exciting delivery method but it's not big enough for the OnDigital viewers. Hmmm... who wants to put money on them changing that tune by the end of next year?

• See p138 for our feature on digital broadcasting.

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## BIG DEAL

I was in my local supermarket the other day when I saw on the wall an advertisement for a shop, which read: 'Today's computers at yesterday's prices'. Probably best avoided?

SEBASTIEN LAHTINEN  
[seb@ncuk.com](mailto:seb@ncuk.com)

## LETTER OF THE MONTH

# Early learning centres

Regarding IT education in schools (*Letters, PCW March*) I am 15 years old and attend an independent school in Newcastle-under-Lyme, where I'd class the teaching of IT as excellent. Unfortunately, most GCSE pupils are disappointed to discover that school IT courses are more about technology and information as opposed to the hands-on use of PCs. So what opportunities are open to those who want to learn more about the lower-level uses of computers such as programming, the internal operation of the machine or, at a simpler level, file management? My advice is to get a prospectus from your local or regional college and look at the courses which may interest you. In addition to having a very enjoyable time, you may also gain useful qualifications. Having taken several courses such as Visual Basic and 'Build your own PC', I have gained several qualifications including a City and Guilds Level 3 in C programming. The homework-scarce years before busy GCSEs are a perfect time to take a

course. Another incentive is that under-18s get the education free! A £400 course will cost you nothing and you also get access to the college's resources.

*Gordon Laing replies > Sam wins our Letter of the Month prize for coming up with a simple solution to pro-actively furthering his IT education. Let's hope the local and regional colleges can handle the strain of large numbers of eager students.*

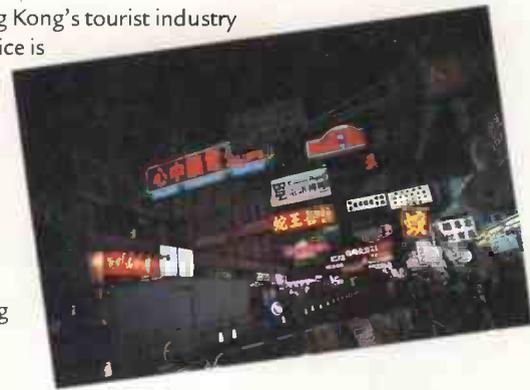
SAM POWELL

[spweb@globalnet.co.uk](mailto:spweb@globalnet.co.uk)

## CAVALIER ABOUT PIRATES

I am sure that some sections of Hong Kong's tourist industry liked your article 'Hong Kong: the price is right', in the February issue, but I can assure you that many members of the Hong Kong Information Technology Federation were disgusted by the sentiments you expressed. You are correct that the authorities out here are finding it difficult to stem the increasing tide of piracy, despite their ever increasing efforts. Why? Because the growing demand for pirate software is continually fuelled by articles like yours which openly advertise its availability and price in such glowing terms and without any attempt to point out the damage that piracy causes. I agree that you describe the shops as 'small and seedy' but you glamourise pirate software with statements such as '...which caught my eye', 'under a tenner' and 'every major application is available'. In addition to being illegal in most parts of the world, piracy is an ever increasing threat to the legitimate IT industry, and hence to its consumers.

JOHN SANDERS  
COUNCILLOR, HK IT FEDERATION  
[bigjohn@edishop.com](mailto:bigjohn@edishop.com)



*Gordon Laing replies > I would like to set the record straight — neither myself nor anyone at PCW condones software piracy. Having visited Hong Kong, I was horrified at the blatantly open sale of pirate software and I felt it was worth reporting. Perhaps my recommendation to buy gadgets as yet unavailable in the UK at bargain prices lightened the piece, but I certainly did not intend to glamourise software piracy.*

## THE TROUBLE WITH IT TEACHING IN SCHOOLS

Last month you published two letters about the role of IT in education. The one from an educational perspective criticised schools for a lack of material resources and technical knowledge, while the 12-year-old student was concerned about the lack of time and relevance of his IT studies. Your comments in reply stressed the view that exposure to IT in schools should be a form of 'training' for the world of work.

As a former student teacher, intending to teach IT in secondary schools, I can confirm that there is much in what Jim Fanning, Director of Sixth Form Studies at Tideway School, says. I don't know if you edited his comments, but the main reason that schools can't provide leadership in any branch of educational IT is that they don't have the money to keep up with even the trailing edge. My teaching practice included one school which still used BBC B and Acorn A3000 computers and another with an unstable network of 25MHz 486SX PCs. Both were characterised by poor teaching conditions and an insufficient number of computers — no class I taught had less than two students to a computer and sometimes one or two computers ended up with three children at once.

As for the view expressed by 12-year-old James Hannington (and yourselves) that IT in schools should be

some kind of training for the outside world, you don't expect CDT lessons to prepare a student for employment as a designer, or English to be preparation for an Editorship; yet IT is saddled with this ridiculous expectation. The role of IT in schools is to expose students to habits of thought and the 'generalities' of using word processors, spreadsheets, databases and graphics packages to achieve results in other subject areas — in other words, IT as a tool. IT in the curriculum is not specifically there to teach the use of spreadsheets for keeping accounts, nor to use a database to keep client information up to date. However, should James opt for an IT course at KS4, he will get exposure to such uses of IT in the project work he will have to carry out.

The use of IT in schools in England and Wales needs to be properly thought out. The current fad for putting schools on the internet is a distraction from the real need for IT to have a proper place devised for it in the curriculum, and proper resources to be allocated. IT labs need to be equipped to cope with actual (not average) class sizes that exist in schools and provision made for 'away from the computer' learning. There must also be a realistic capitation allowance for new equipment and proper continuous training for IT teachers, not the common INSET stuff provided by local authorities.

NAME WITHHELD BY REQUEST



## MAC MUCK-UP

According to the *Gadgets* pages in your March issue, the Apple iMac attracts VAT at a rate of 75%. Methinks that a harassed Nik Rawlinson has entered 1.75 instead of 1.175 when calculating the retail price inclusive of VAT from the ex-VAT selling price. Or are we witnessing the imposition of a new Euro VAT hike to restrict the flow of fluorescent computers into the UK? The beige box lobby must have friends in high places...

ANDREW JONES  
a.e.jones@dial.pipex.com

**Gordon Laing replies >** You're right: it should have been 1.175. My fault again — I was actually harassing Nik at the time he made the calculation. Still, the nice, new iMac colours are some consolation.

## DIFFERENT PLUGS MAKE SENSE

Why does Gordon Laing pity the first-time user connecting up their PC (*Editorial, PCW March*)? With only one 5-pin DIN socket on a PC, there is only one place into which the keyboard can go. It's when you have more than one connector of the same type that the novice user starts to encounter problems. I am sure more people have got muddled deciding which of two identical 9-pin serial ports is the right one for their modem, than thinking about whether to plug the modem into, say, the printer socket! Using different connectors for each peripheral makes perfect sense, and the fact that the industry has gone along with it for 15 years means it wasn't that bad.

Your feature on USB and IEEE 1394 (*also March*) was a great help explaining the differences between USB and 1394. Author Roger Gann rang no alarm bells, though: we've seen dual bus standards before, with VL Bus and PCI battling it for supremacy on the motherboard. And guess who won? The faster and neater of the two. What's the betting that 1394 ends up the real winner in 1999/2000. It's quicker, looks neater, and is useful inside the box as well as outside.

WILLIAM WATSON  
william.watson@fraserwatson.co.uk

**Gordon Laing replies >** I agree. In fact, some time ago I wrote in my *Editorial* that it could already be too late for USB. 1394's performance is not only considerably higher, but the fact that it can operate peer-to-peer without the aid of a PC host, makes it the best bet for consumer electronics and future convergent products. Really though, I'd welcome both technologies into my home and office, and if we're being picky there are currently two different sockets for the keyboard!

## CONSUMED WITH AGE

So, Michael Hewitt thinks that the Psion Series 5 is a '£400 alarm clock' (*PCW March*). I won't list all the things he got wrong, but I can't resist the bit about the battery consumption. I am writing this on a Series 5 with batteries that were replaced two weeks ago. They have been in use for 10hrs 58mins and are still showing a remaining life of more than 50 percent. My only warning to anyone who may be influenced by Michael's comments would be this: should you really trust the judgement of someone who pays £400 for a Series 5 when they are widely available for under £350?

GEOFF DENNIS

geoff.dennis@btinternet.com



**Michael Hewitt replies >** *You must let me know the name of the battery manufacturer so I can buy shares in the company. According to my Battery Usage monitor, I got 3hrs 52mins out of my last set of Duracells. Then again, it's very difficult to read anything properly in the Series 5's contrasty, overly reflective screen, so I checked with other owners. They confirm that less than five hours is pretty much typical. As for the price, yes, today you can pick up a Series 5 for around £350. Mine was bought last August, however. But the fact that, in under six months, the RRP has dropped from £499 to nearer £300 (now, usually, with a padded case thrown in) suggests that the dealers are having a certain amount of difficulty shifting the things. Hardly a sign of a successful, technologically mature product.*

**Gordon Laing adds >** *I would just like to point out that I am rather fond of my Series 5, although like Michael's, my batteries rarely last longer than four hours.*

## FAN MAIL

I read the 'Future CPUs for Windows 2000' article (*PCW March*) with some amusement. We

currently have a fan in the PSU, one for each processor, and some high-speed hard disks also have one. Graphics cards come with heatsinks, and cases can have an extra one or two to increase air-flow. So, when these 800MHz memory chips and 1GHz processors come out, it will probably be easier to remove all the fans and place your PC into a large chest freezer! If you don't believe me, look at the evidence: a 386 ran at 40MHz and 5v and required no cooling. A P2 runs at 233 to 450MHz and needs a chunky heatsink and fan, yet runs at only 2.2v. As the voltage cannot drop much more, what will a 1GHz Mercedes need for cooling? Surely we're not returning to the 'old days' where computers could only be used in special, air-conditioned rooms?

A. BUTLER

butler01@ndirect.co.uk

**PCW replies >** *Fans of attractive heatsinks should check out this month's cover model — phwoor! Perhaps readers would like to send in photos of their favourite cooling devices?*

## THE MP3 BLUES

I periodically visit the Computer Fairs in both the North West and the South East and the latest trend seems to be pirating music CDs. Not just one album of material per disc, though — these discs use MP3 and typically contain between ten and thirty (or more) albums of one artist on a single CD: the complete works of the Beatles or the Rolling Stones, for instance. Each CD sells for about £15. Perhaps the music industry should start getting worried.

DAVID BOLTON, LANCs

**PCW comments >** *The music industry is already worried.*

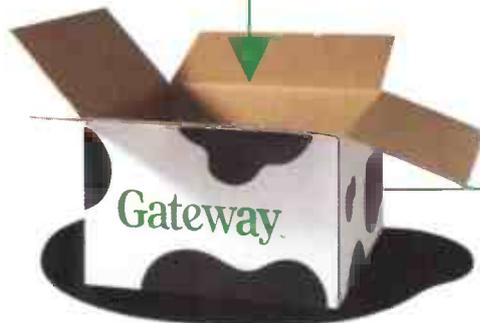
*On the one hand, many artists are enjoying the freedom of distributing preview or taster tracks over the internet, using MP3. On the other hand, there are copyright issues, and that's before you even consider piracy situations such as those described by David. MP3 and music over the net is a hot subject, which is why we've published a special report in this issue's News, pp38/39.*

## I'VE A COMPLAINT

Before you start complaining about computer illiteracy in media personnel (*ChipChat, March*) perhaps you should get a grown-up to explain to you the difference between a slash and a back-slash!

IVOR NASTIKOV

**IVOR BUGBEAR replies >** *Aha! I knew that would generate a response! A purely deliberate mistake, er, honestly.*



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- 16MB STB //Vidia TNT AGP Graphics
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- ATX Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse.
- McAfee Anti-Virus Software
- MS Office 97 Small Business Edition 2††
- Year 2000 Hardware Compliant\*

**£1299 (€1526.32 inc. VAT)**

FROM £59 A MONTH\* (APR 18.9%)  
Cash price inc. VAT & delivery £1567.45  
Credit Limit £1770 Loan Value £1567.45  
33 payments of £59, one final payment of £46.91  
Total amount payable £1993.91

### Multimedia

#### G7-500

- Intel® Pentium® III Processor, 500MHz
- 512KB L2 Cache
- 128MB 100MHz SDRAM, expandable to 384MB
- 10GB 9.5ms Ultra ATA Hard Drive
- Iomega 100MB Internal Zip Drive
- 3.5" 1.44MB Floppy Disk Drive
- DVD ROM III Drive and software based MPEG II Decoder
- 16MB STB //Vidia TNT AGP Graphics
- Sound Blaster AudioPCI 64D
- Boston Acoustics BA635 5W Speakers with 15W Subwoofer
- Telepath II V.90 Modem\*
- 17" EV700 TCO-95, 0.28dp Monitor†
- ATX Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- MS Office 97 Small Business Edition 2††
- Year 2000 Hardware Compliant\*

**£1499 (€1761.32 inc. VAT)**

FROM £69 A MONTH\* (APR 18.9%)  
Cash price inc. VAT & delivery £1802.45  
Credit Limit £2070 Loan Value £1802.45  
33 payments of £69, one final payment of £48.2  
Total amount payable £2281.82

## A CUSTOM BUILT PC WITH THE NEW INTEL PENTIUM III PROCESSOR

If you want the latest and the fastest we can custom build you a computer to do just that. The new Intel Pentium III Processor 500MHz has hit the streets, shifting PCs into overdrive. You'll move faster round the web, faster round the bends. Game play takes on a whole new reality. So if you want to move into the fast lane; call and we'll talk specifications. But then whatever PC you order you'll get free Internet access<sup>5</sup> and a computer that's real value for money; because it's built for you and you buy direct. And to make sure you stay cutting edge there's also the Your:)Ware™ trade-in option<sup>‡</sup>. We've suggested some configurations but you're in the driving seat, call and have it your way.



### YOUR G7-500XL

- Intel® Pentium® III Processor, 500MHz
- 512KB L2 Cache
- 128MB 100MHz SDRAM, expandable to 384MB
- 13.6GB 9.5ms Ultra ATA Hard Drive
- SuperDisk LS120MB Floppy Disk Drive
- DVD ROM III Drive and software based MPEG II Decoder
- 16MB STB //Vidia TNT AGP Graphics
- Sound Blaster AudioPCI 64D
- Boston Acoustics Digital Media Theater 20W Speakers with 30W Subwoofer
- Full-featured V.90 Winmodem\*
- 19" EV900 TCO-95, 0.26dp Monitor†
- ATX Full Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- MS Office 97 Small Business Edition 2††
- Year 2000 Hardware Compliant\*

**£1799 (€2113.82 inc. VAT)**

FROM £79 A MONTH\* (APR 18.9%)  
Cash price inc. VAT & delivery £2154.95  
Credit Limit £2370 Loan Value £2154.95  
34 payments of £79, one final payment of £76.52  
Total amount payable £2762.52

**0800 17 2000**

Have it your way



**Gateway**

www.gateway.com/uk

**Set me free on the net,  
for free.**



## GATEWAY FREE INTERNET ACCESS

If you want a home PC with free Internet access<sup>‡</sup>, then have it your way. **gateway.net** gives you high speed, high quality Internet access... free. There's also 10MB of free web space, so it's easy to create a page you can call home. Add to this 5 e-mail addresses, and you have a PC package that will keep the whole family happy. And if you buy with the Your:Ware trade-in™ option, in two years time you can upgrade<sup>‡</sup>. What's more, you don't have to be an expert, we always listen and talk first; so we build the PC that's right for you. We've suggested some configurations, but it's your computer, have it your way.



## WAYS TO HAVE IT YOUR WAY

### Multimedia

#### G6-366C

- Intel® Celeron™ Processor, 366MHz
- 128KB Full-Speed L2 Cache
- 64MB SDRAM, expandable to 256MB
- 3.2GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro Turbo 3D AGP Graphics w/ 4MB SGRAM
- Sound Blaster™ AudioPCI™ 64V
- Altec® Lansing GCS100 Speakers
- Telepath II V.90 Winmodem\*
- 15" EV500 TCO-95, 0.28dp Monitor†
- ATX Mini Tower Case
- 105 Keyboard
- MS Windows 98, MS Intellimouse
- McAfee Anti-Virus Software
- MS Home Essentials 98
- Choice of a Gateway Software Bundle\*\* Arcadia, Source, Young Scholar
- Year 2000 Hardware Compliant\*

**£699 (€821.32 inc. VAT)**

FROM £29 A MONTH\* (APR 18.9%)  
Cash price inc. VAT & delivery £862.45  
Credit Limit £870 Loan Value £862.45  
39 payments of £29, one final payment of £5.74  
Total amount payable £1136.74

### Multimedia

#### G6-400C

- Intel Celeron Processor, 400MHz
- 128KB Full-Speed L2 Cache
- 64MB SDRAM, expandable to 256MB
- 6.4GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- 3D AGP Graphics Accelerator w/ 8MB SDRAM
- Sound Blaster AudioPCI 64D
- Altec Lansing GCS100 Speakers
- Epson Stylus 440 Colour Printer
- Telepath II V.90 Winmodem\*
- 17" EV700 TCO-95, 0.28dp Monitor†
- ATX Mini Tower Case
- 105 Keyboard
- MS Windows 98, MS Intellimouse
- McAfee Anti-Virus Software
- MS Home Essentials 98
- Choice of a Gateway Software Bundle\*\* Arcadia, Source, Young Scholar
- Year 2000 Hardware Compliant\*

**£879 (€1032.82 inc. VAT)**

FROM £39 A MONTH\* (APR 18.9%)  
Cash price inc. VAT & delivery £1078.65.  
Credit Limit £1170 Loan Value £1078.65.  
35 payments of £39, one final payment of £23.63.  
Total amount payable £1388.63

## Your:Ware Software

### HOME PACKS

- ⊕ **Reference Pack**  
Encyclopedia Britannica; Oxford Reference Shelf; Pinball Science; History of the World 2.0; Encyclopaedia of Science; Chronicles of the Twentieth Century.  
**£50 (€58.75 inc. VAT)**
- ⊕ **Family Pack**  
Geoff Hamilton's 3D Garden Designer; Rhodes on ROM; Visual Home Deluxe; BMA Family Health Encyclopedia; Family Tree Maker.  
**£50 (€58.75 inc. VAT)**

### EDUCATION PACKS

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Noddy — The Magic of Toytown; Pingu — A Barrel of Fun; Animals of Farthing Wood; Crayola Magic 3D Colouring Book; Crayola Magic Wardrobe; Stanley's Sticker House; Muppets — Read, Listen and Learn.  
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**£50 (€58.75 inc. VAT)**
- ⊕ **Secondary School Pack**  
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**£50 (€58.75 inc. VAT)**

## YOUR POWER GAMES & MICROSOFT PACKS

- ⊕ **Power Games\***  
Unreal™ (GT Interactive™); Quake II™ (ID Software™); Forsaken (Acclaim™); Conflict Freespace™; The Great War™ (Interplay™); Motorhead™ (Gremlin™); Battlezone™ (Activision™); Incoming™ (Rage™).  
**£99 (€116.32 inc. VAT)**
  - **\*\*Gateway Arcadia**  
MS Flight Simulator™ 98; MS Age of Empires; MS CART Precision Racing; MS Monster Truck Madness™; MS Golf.  
**£50 (€58.75 inc. VAT)**
  - **\*\*Gateway Source**  
MS Encarta® Encyclopedia 98 (US Version); MS AutoRoute™ Express Europe 98; MS Publisher 97; Greetings Workshop.  
**£50 (€58.75 inc. VAT)**
  - **\*\*Gateway Young Scholar**  
MS Creative Writer 2.0; Scholastics™ The Magic School Bus; The Solar System, The Ocean, The Human Body, In the Age of Dinosaurs; 3D Movie Maker (Nickelodeon).  
**£50 (€58.75 inc. VAT)**
- ⊕ Your:Ware qualifying software.  
⊕ Contents suitable for persons aged 17 and over.

**0800 17 2000**

Have it your way



**Gateway**

www.gateway.com/uk

# It's your call.

These are just some of the specifications to which we can build your computer. But remember, you don't have to be an expert, we're here to listen and talk. That way we can build the PC that works your way.

## Professional PC

### GP6-366C

- Intel® Celeron™ Processor, 366MHz
- 128KB Full-Speed L2 Cache
- 32MB SDRAM, expandable to 256MB
- 3.2GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro Turbo 3D AGP Graphics w/ 4MB SGRAM
- Sound Blaster AudioPCI 64V
- 15" EV500 TCO-95, 0.28dp Monitor\*
- ATX Mini Tower Case
- 105 Keyboard
- Microsoft Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 98; MS Outlook™ 97
- Year 2000 Hardware Compliant\*

**£599 (£703.82 inc. VAT)**

Business Lease £4.82 weekly\*

## Professional PC

### GP7-450 SE

- Intel® Pentium® III Processor, 450MHz
- 512KB L2 Cache
- 64MB 100MHz SDRAM, expandable to 384MB
- 3.2GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro 8MB SDRAM 3D AGP Graphics Card
- Sound Blaster™ AudioPCI™ 64D
- 17" EV700 TCO-95, 0.28dp Monitor\*
- ATX Desktop Case
- 105 Keyboard
- Microsoft® Windows® 98, MS® IntelliMouse™
- McAfee Anti-Virus Software
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 98; MS Outlook™ 97
- Year 2000 Hardware Compliant\*

**£999 (£1173.82 inc. VAT)**

Business Lease £8.04 weekly\*

## Professional PC

### GP7-450

- Intel Pentium III Processor, 450MHz
- 512KB L2 Cache
- Intel® 440BX AGPset
- 128MB 100MHz SDRAM, expandable to 384MB
- 6.4GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- 16MB STB #Vidia Riva TNT AGP Graphics
- Sound Blaster AudioPCI 64D
- 17" EV700 TCO-95, 0.28dp Monitor\*
- ATX Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- MS Office 97 Small Business Edition 2\*\*
- Year 2000 Hardware Compliant\*

**£1199 (£1408.82 inc. VAT)**

Business Lease £9.64 weekly\*

## Workgroup Server

### ALR-7200

- Intel® Pentium® II Processor, 350MHz
- 512KB ECC L2 Cache
- Dual Processor Support
- Intel 440BX AGPset
- 64MB ECC SDRAM, expandable to 1GB
- Dual Channel Integrated PCI Ultra2 SCSI Controllers
- Integrated RAID Port III Connector
- 4GB Ultra2 LVD SCSI Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max IDE CD-ROM
- Integrated 2MB PCI Graphics Accelerator
- Integrated Intel PCI 10/100 Ethernet Adapter
- 15" EV500 TCO-95, 0.28dp Monitor\*
- 300 Watt Tower case
- 6 PCI, 1 PCI/ISA slot
- 105 Keyboard, MS IntelliMouse
- InforManager Server Management Software
- 30 Day NT™ Operating System Support\*
- Year 2000 Hardware Compliant\*

**£1499 (£1761.32 inc. VAT)**

Business Lease £12.06 weekly\*

## Notebook

### Gateway Solo™ 2500 SE

- 12.1" SVGA TFT Colour Display
- Intel® Mobile Celeron™ Processor 266MHz
- Intel 440DX Chipset, USB ports
- Integrated 128K Full-speed L2 Cache
- 32MB SDRAM, expandable to 288MB
- 3.2GB 13ms Removable EIDE Hard Drive
- Integrated 3.5" 1.44MB Floppy Disk Drive and integrated 8/20X CD-ROM
- Neo Magic 128-Bit 2MB VRAM
- Wavetable Sound with Stereo Speakers
- 12 Cell 60Whr Lithium-Ion Battery
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 98; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant\*

**£1099 (£1291.32 inc. VAT)**

Business Lease £8.84 weekly\*

## Notebook

### Gateway Solo 2500 XL

- 13.3" XGA TFT Colour Display
- Intel® Mobile Pentium® II Processor, 333MHz
- Integrated 256K Full-speed L2 Cache
- Intel 440BX Chipset, USB ports
- 64MB SDRAM, expandable to 288MB
- 4,3GB 13ms Removable EIDE Hard Drive
- Integrated 3.5" 1.44MB Floppy Disk Drive and integrated 8/20X CD-ROM Drive
- Neo Magic 128-Bit 2MB VRAM
- Wavetable Sound with Stereo Speakers
- 12 Cell 60Whr Lithium-Ion Battery
- Classic Carrying Case
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 98; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant\*

**£1599 (£1878.82 inc. VAT)**

Business Lease £12.86 weekly\*

## Notebook

### Gateway Solo 9100 SE

- 14.1" XGA TFT Colour Display
- Intel Mobile Pentium II Processor, 300MHz
- Integrated 256K Full-speed L2 Cache
- Intel 440BX Chipset, USB ports
- 64MB SDRAM, expandable to 384MB
- 4,3GB 13ms Removable EIDE Hard Drive
- Modular Combo Drive with 3.5" Floppy Disk Drive & 8X min/20X max Toshiba™ CD-ROM
- Trident 4MB SGRAM
- Wavetable Sound with Stereo Speakers
- 12 Cell 60Whr Lithium-Ion Battery
- Classic Carrying Case
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 98; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant\*

**£1649 (£1937.57 inc. VAT)**

Business Lease £13.26 weekly\*

## Notebook

### PC Buyers Bible 1999 Recommended

### Gateway Solo 9100 XL

- 14.1" XGA TFT Colour Display
- Intel Mobile Pentium II Processor, 366MHz
- Integrated 256K Full-speed L2 Cache
- Intel 440BX Chipset, USB ports
- 128MB SDRAM, expandable to 384MB
- 6.4GB 13ms Removable EIDE Hard Drive
- Modular Combo Drive with 3.5" Floppy Disk Drive & 8X min/20X max Toshiba™ CD-ROM
- Trident 4MB SGRAM
- Wavetable Sound with Stereo Speakers
- 12 Cell 60Whr Lithium-Ion Battery
- Deluxe Leather Carrying Case
- V.90 Flex PCMCIA Fax/Modem
- MS Windows 98
- MS Office 97 Small Business Edition 2
- Laplink Software
- Year 2000 Hardware Compliant\*

**£2349 (£2760.07 inc. VAT)**

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DVD/L5120 Combo Drive Upgrade  
£205 (£240.87 inc. VAT)

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FINANCING \*Your:Ware (Consumer purchases only). Available on all our PCs. Assumes 1: no variation in interest rate. 2: all repayments made by due date. 3: no further advances are made. Credit is only available to persons aged 18 or over, subject to status. Written quotations available on request. Arranged by Schroder Leasing Limited. \*Schroder Business Leasing. Finance facilities are available to companies in business for over 2 years and subject to acceptance by Schroder Finance Limited. All business lease figures are shown as a weekly value, exclusive of delivery and VAT. Payments are collected quarterly by Direct Debit. Full details of the finance facilities are given when you call. Terms and conditions of the lease agreement will be sent to you before you sign.

# Oh, my.



Introducing the 250MB Zip<sup>®</sup> drive and disks. In stores now.

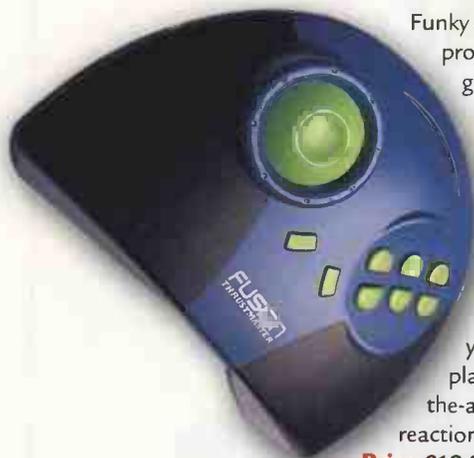
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## ▽ Fusion digital game pad



Funky colours and no less than ten programmable buttons make this game pad stand out from the crowd. It's both PC and iMac compatible, with all relevant drivers and a choice of USB or game-port connection. Its comfortable, ergonomic design allows the manufacturers to boast that no matter what the size of your hands, you'll be able to play for hours, and the state-of-the-art digital circuitry makes its reactions more precise.

**Price** £19.99 (£17.02 ex VAT)  
**Contact** Thrustmaster 01276 609955  
[www.thrustmaster.co.uk](http://www.thrustmaster.co.uk)

## Marble marvel

It may look like a dead fish, but this is one of the next generation of trackballs. The Marble Mouse promises smoother and more reliable performance because there are no moving mechanical parts. Instead, an optical system watches the movement of the large red ball on the front and tells your PC what's going on. Its pointed shape makes it great for both left- and right-handed users and because it's not a mouse, it uses less space on the desk.

**Price** £27.99 (£23.82 ex VAT)  
**Contact** Logitech  
 0181 308 6582  
[www.logitech.com](http://www.logitech.com)



## Colourful character

It seems strange that nobody has thought of doing it before, but it's taken until now for Hewlett-Packard to come up with the world's first colour palm-sized PC. The Jornada 420 comes packed with nifty little features like screen presets for indoor and outdoor use, and even has a lift-up transparent cover to protect the screen. (See p82 for our full review.)

**Price** £399 (£339.50 ex VAT)  
**Contact** Hewlett-Packard 0990 474747  
[www.hp.com/jornada](http://www.hp.com/jornada)



## ▽ Swipe me

Scanners on the back of a keyboard are small and flashy but by comparison the CapShare 910 is tiny and blinding. Simply wipe it across any document and within six seconds you'll have a faithful reproduction in its memory. No bigger than a portable CD player, it takes standard AA batteries and has an IR port for transmitting documents to your PC or PDA. Watch out for our full review in next month's issue.

**Price** £499 (£424.68 ex VAT)  
**Contact** Hewlett-Packard 0990 474747  
[www.hp.com](http://www.hp.com)

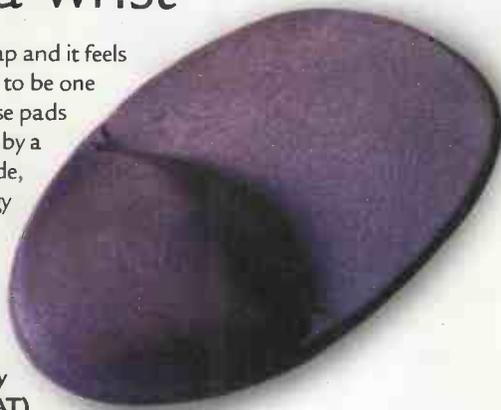


## Right... you're under a-wrist

It looks like a flat baseball cap and it feels like nothing on earth. This has to be one of the softest wrist-rest mouse pads around. The hand is cushioned by a hollow in the underside, combined with a super-spongy gel pad, maintaining the required 'horizontal' hand-arm position. Moreover, the anti-skid tacky bottom will stop it slipping around your desk.

**Price** £12.99 inc delivery  
(£11.06 ex VAT)

**Contact** Urathon 01869 342364  
[www.urathon.com](http://www.urathon.com)



## Hands off!

Security for your laptop, plain and simple. With more notebooks being stolen every day, something like the Defcon 1 could be a lifeline for users. Use the integrated 95ft cut-resistant cable to tie your computer to a static object such as an airport chair or table and it's there for good — or at least until you release it using the 1,000-combination lock. Alternatively, activate the 360° motion sensor and the slightest movement will activate a 110dB alarm — and that equates to the same sort of noise you'd get from a chainsaw!

**Price** £39.99  
(£34.03 ex VAT)

**Contact** Targus  
0181 607 7028  
[www.targus.com](http://www.targus.com)



## Tricky Tixi

The Tixi-Mail box looks great and it can be a time-saver, too, as it has been designed to send and collect email as well as receive faxes, unattended. In contrast

to standard modems,

this 56K model actually stores faxes before it sends them, so they can be sent at a more cost-conscious time of day. Its base memory of 2Mb (4Mb for the networked model) will store up to 1,000 emails or around 100 fax pages.

**Price** £99 (£84.26 ex VAT)

**Contact** Itochu Electronics +49 211 3 6850 (Germany)  
[www.tixi.com](http://www.tixi.com)



## Fixtures and Fittings

If your PC is not in a bedroom or study, the chances are it's in your living room. So, instead of letting it quietly clutter up a corner, why not make it a focal point with one of these groovy chairs from System 41? Available as an all-in-one solution, as pictured here, or as the side table alone for use with any chair, sofa or settee, it's the ideal solution for those who think a PC is as important as the TV, hi-fi or cat basket.

**Price** £475 (£404.26 ex VAT) illustrated right  
**Contact** System 41; 01495 313900



### Bundle One

Microsoft Windows® 98\*, Lotus Smartsuite Including: WordPro, Organiser, 1-2-3, Approach, Freelance Graphics, Corel Draw Suite 7 Select Edition Inc: Draw 7, Photopaint 7, OCR-Trace, Kodak Digital Colour Management, Corel Scan, 50 Clipart & 50 Fonts, IBM Worldbook Encyclopedia, IBM ViaVoice continuous dictation software, IBM Antivirus 3, 30 day free unlimited internet access account.

### Bundle Two

AGP enhanced software bundle: Red Line Racer, G-Police, JazzJackrabbit 2, Tonic Trouble, O-Zone, Beyond the Third Dimension, F22 Air Dominance Fighter.

Software bundles are subject to change without notice



## PANACOM

**£799**

- Intel® Pentium® Processor 266MHz
- 12.1" TFT colour display
- 512k level 2 cache,
- 2.1Gb Ultra DMA hard drive
- 32Mb SDRAM expandable to 288Mb
- 128bit 2Mb graphics accelerator
- 20 Speed CD-ROM Drive
- 3.5" 1.44Mb disk drive
- 16bit Stereo sound with built-in speakers and microphone
- 'Smart' extended life battery
- 87 Key Windows® Keyboard & touchpad
- Two PCMCIA type II or one type III slots
- Infrared IrDA 1.1 communication port

## AXIS 333i

**£499**

- Intel® Celeron™ Processor 333MHz
- 128k On Chip Cache
- Intel® 440EX AGP set
- 64Mb SDRAM, expandable to 256Mb
- 4.3Gb Ultra DMA hard drive
- ATI® 4Mb 3D AGP graphics engine
- 14" 0.28 SVGA colour monitor
- 36Max CD-ROM drive
- PCI 64 voice wavetable sound
- 160 Watt (PMPO) stereo speakers
- 56k voice fax & data modem
- Microsoft Windows 98

## EPRO 366

**£699**

- Intel® Celeron™ Processor 366MHz
- 128k On Chip Cache
- Intel® 440BX AGP set
- 64Mb SDRAM, expandable to 512Mb
- 8.4Gb Ultra DMA hard drive
- ATI® Xpert 98™ 8Mb 3D AGP graphics with DVD-video decoding
- 15" 0.28 SVGA colour monitor
- Third Generation DVD Drive
- Creative Soundblaster 64™ PCI audio
- 200 Watt (PMPO) stereo speakers
- 56k voice fax & data modem
- Microsoft Windows 98
- **SOFTWARE BUNDLE ONE**

**Panacom 266EL** £799 Inc VAT & Del. Per Month  
£961.15 £30.69\*

Spec as Panacom 266el with 64Mb SDRAM, 4.1Gb hard drive and 56k fax modem.

**Panacom 266SL** £999 Inc VAT & Del. Per Month  
£1196.15 £38.20\*

Spec as Panacom 266sl with Intel® Pentium® II processor 300MHz, built in DVD ROM, ATI Rage Pro 8Mb AGP Graphics & 14.1" XGA TFT screen.

**Panacom 300** £1549 Inc VAT & Del. Per Month  
£1842.40 £58.83\*

**Axis 333i** £499 Inc VAT & Del. Per Month  
£608.65 £19.44\*

Spec as Axis 333i with Intel® Celeron™ Processor 400MHz, 15" SVGA colour monitor & Software Bundle 1.

**Axis 400s** £599 Inc VAT & Del. Per Month  
£726.15 £23.19\*

Spec as Axis 400s with Colour Inkjet Printer and A4 Flatbed Scanner

**Axis 400ps** £699 Inc VAT & Del. Per Month  
£843.65 £26.94\*

**Epro 366i** £699 Inc VAT & Del. Per Month  
£843.65 £26.94\*

Spec as Epro 366i with Intel® Celeron™ Processor 400MHz, 17" SVGA colour monitor.

**Epro 400** £769 Inc VAT & Del. Per Month  
£925.90 £29.57\*

Spec as Epro 400 with Intel® Celeron™ Processor 433MHz.

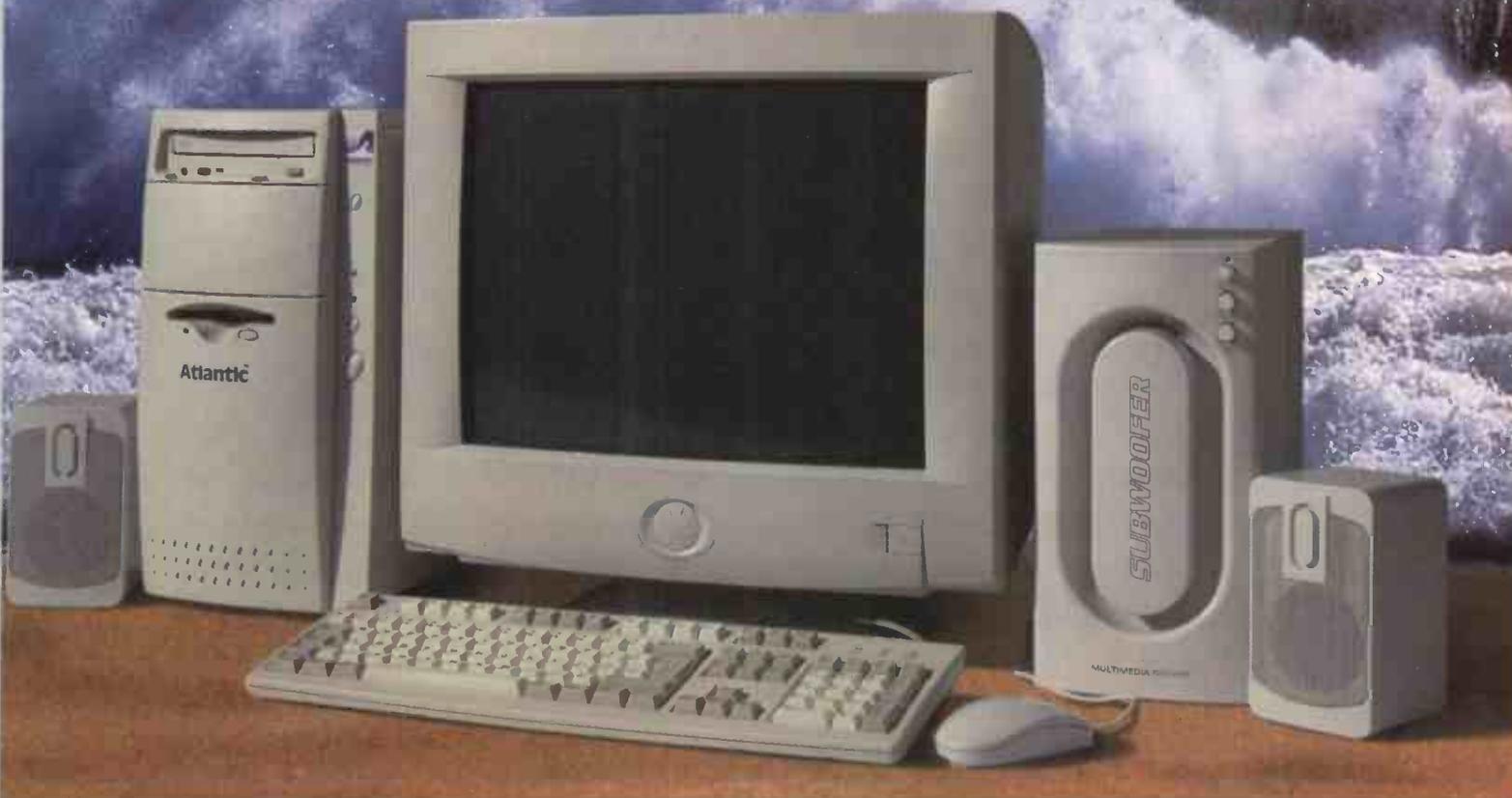
**Epro 433** £799 Inc VAT & Del. Per Month  
£961.15 £30.69\*

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# reviews

This seems like a month of follow-ups! After the success of the iMac, now available in a fruity five-pack, Apple has released a similarly **STYLISH G3**. HP, too, is after a second helping of a market in which it has had recent success by debuting the second member of its **NEW JORNADA RANGE** and PCW gets a sneak preview of this, the **WORLD'S FIRST** colour palm-sized PC. Adobe has been busy releasing version 4 of both **ACROBAT**, the document publisher, and **AFTER EFFECTS**, its 3D animation tool. Lexmark's new **JETPRINTER 5770** is aimed squarely at the digital photo professional, with dedicated slots for CompactFlash and SmartMedia cards. Users of Adobe PhotoShop will be keen to get their hands on the latest version of the package's premier plug-in, **KAI'S POWER TOOLS 5**. Corel is hoping to gain further ground in the business market with its forthcoming release of **WORDPERFECT OFFICE 2000**. We lift the lid on a beta version of



this powerful new suite, but open this month's *Reviews* with an early look at a **NEW BREED** of computer. The Silicon Graphics 320 not only redefines graphical computing, but it looks great, too.



NIK RAWLINSON  
REVIEWS EDITOR

[NIK\\_RAWLINSON@VNU.CO.UK](mailto: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.

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- 108 Roland XP-60 Music Workstation vs Terratec microWAVE PC Sound System

## Ratings

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

# Silicon Graphics 320

## Visual workstation

New architecture, graphics power **beyond your wildest dreams** and with the looks to match.

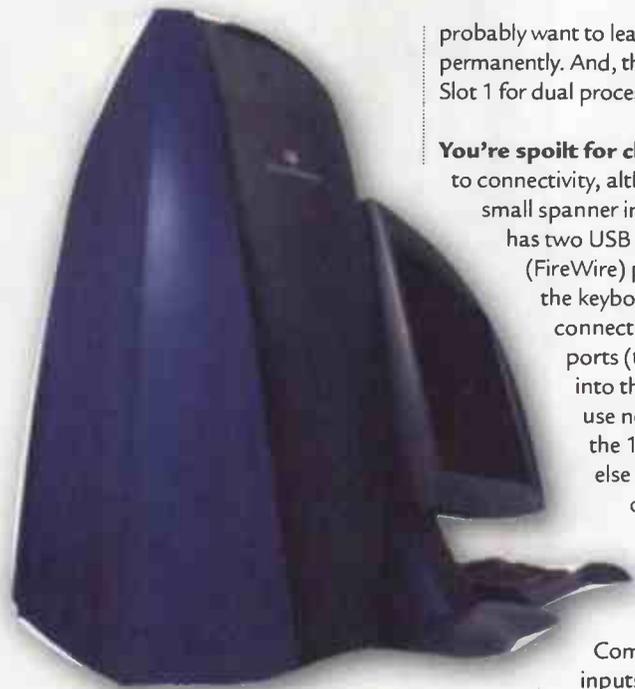
**T**here are quite a few people in this world who have recently been forced to eat their hats, since SGI has done what many of them had previously considered unthinkable: it has produced an Intel-based NT box. It's really not that surprising, all things considered. Intel's vast design and manufacturing resources means that the company is now producing processors which can compete at the high end of the market, yet cost ridiculously little.

The initial product line consists of the 320 and 540 machines. We looked at the former, which came with 256Mb RAM and a single 450MHz Pentium II. It was a Beta preview version of the system so we weren't able to benchtest it. We did give it a thorough inspection, though.

Although SGI has sensibly taken advantage of the high price/performance ratio of current Intel processors, it has fortunately ignored standard PC architecture and chipsets, designing its own from the ground up. The new architecture is called IVC (Integrated Visual Computing) and takes advantage of the fact that a system like this can disregard the need to conform to legacy standards.

**The new architecture's primary advantage** is extremely high bandwidth interconnection. This enables the use of system memory for standard program execution as well as graphics. In a way, this is a return to computing's old days but with the advantage of a memory bus able to shift data at 3.2Gb/sec — around six times the speed of a standard AGP 2X bus. Powering up the 320 for the first time reveals a pretty startup screen, closely followed by the familiar blue NT4 OS loader, but this showed that of the 256Mb of RAM in the system, 140Mb was reserved for the use of the SGI Cobalt Graphics chipset.

Our 320 was supplied with SGI's rather fabulous 1600SW flatpanel



display, which uses an OpenLDI digital link to avoid redundant analogue-to-digital conversion and has an adjustable white point and colour calibration sensor. It runs at a native resolution of 1600 x 1024 in a wide aspect ratio format and, after using it for a while, it starts to seem a lot more natural than the usual 4:3 ratio of standard displays.

The box itself is an imposing-looking beast and opinions about its aesthetics

were mixed. The lighter blue side panel overlaps the front of the case by

about an inch. This is great for gaining access to the machine since it gives you a hand-hold to pull it forward and away, but it makes the whole thing look odd.

Once inside, any thoughts of the 320 being a standard Wintel clone are quickly dispelled. If you're the sort of person who gets excited by motherboards, the 320 will have you frothing at the mouth. It's a glorious-looking thing and exudes so much custom-designed chic, you'll

probably want to leave the side off permanently. And, there's a second Slot 1 for dual processing, if you so desire.

**You're spoilt for choice** when it comes to connectivity, although there is a small spanner in the works. The unit has two USB as well as two 1394 (FireWire) ports. Even though the keyboard and mouse connect to one of the USB ports (the mouse plugging into the keyboard) you can use neither the USB nor the 1394 for anything else until the release of Windows 2000, because Windows NT4 just doesn't support them.

There are Composite and S-Video inputs and outputs, RJ45 10/100BaseT networking and parallel and serial connections, all integrated into the motherboard. Internal expansion consists of one 32-bit and two 64-bit PCI slots.

The 320 is a fabulous machine with an inherent limitation: the custom design is well ahead of the standard Wintel pack, but apart from the RAM, it's not easily upgraded. For the foreseeable future though, the 320 will knock the spots off any other Pentium II system for any kind of graphics-based application.

DAVID FEARON

*If you're excited by motherboards, the 320 will have you frothing at the mouth*

### PCW DETAILS

★★★★

**Price** System box £3,818.75 (£3,250 ex VAT); flatpanel £2,021 (£1,720 ex VAT)

**Contact** Silicon Graphics 07000 320540

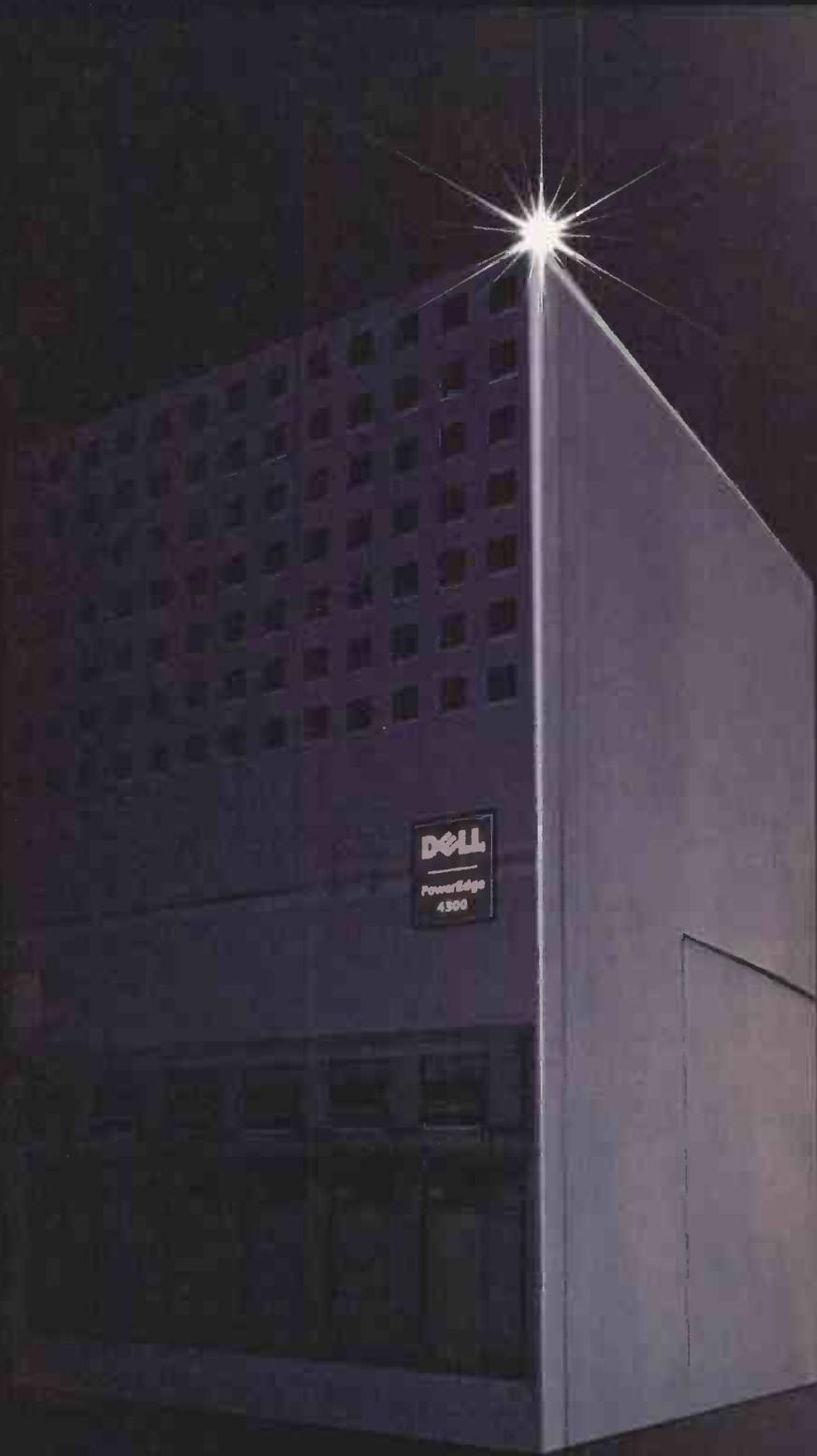
[www.sgi.co.uk/visual](http://www.sgi.co.uk/visual)

**Good Points** A system architecture with no bottlenecks. Massive graphics performance.

**Bad Points** Integrated design means you can't just pull out and swap components, but this isn't an issue for now.

**Conclusion** A high-end workstation that any professional can afford.

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\*Source: PC Magazine August 98, Service and Reliability Survey 98, Servers.

†Source: IDC Top 4 Manufacturers Worldwide.

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# Apple Power Macintosh G3/350



**Fast-and-furious Mac** at a reasonable price. And it's better-looking than a PC, too.

**F**ollowing the success of the consumer-orientated iMac, Apple has let the plastic fetishists in its industrial design team loose on its professional-level G3 range. The result is not quite as stylish as the iMac, but then, there's only so much you can do with a rectangular tower design.

The translucent matt finish of the side panels is quite attractive but the shiny blue front panel looks tacky. The curved handles on the front and back edges are a nice touch, and very practical.

But it's what's inside these machines that is interesting. In fact, simply delving inside is enjoyable, as the motherboard is situated on a panel that opens up out of the side of the unit. Just press the little switch at the top of the panel and the entire motherboard is laid out in front of you. Situated on the motherboard is a copper-based PowerPC 750 processor (also known as G3). We tested the mid-range 350MHz version but there are versions which run at 300MHz and 400MHz, too.

**The standard configuration** for the 350MHz model is 64Mb RAM, 6Gb hard disk, and DVD-ROM drive. However, there are numerous other options available if you order through Apple's online store, including items such as internal modems, Zip drives and SCSI adapters. There's room inside for two additional hard drives and

you can upgrade the RAM to 1Gb, which will please professional designers and video editors who have to work with huge video and graphics files.

**The performance of the G3 processor** is pretty impressive, too. Apple's benchmarks claim that the G3 processor is twice as fast as a Pentium II running at a comparable speed. Those benchmarks are for processor performance only, though, and are not a true indication of the real-world performance of the entire system. Even so, our tests prove that the 350MHz model is a match for a 450MHz Pentium II when running various Photoshop filters. Applying a Gaussian blur to a 20Mb file took eight seconds on the Mac compared to 11.5 seconds on the PC. Applying a series of filters indicated an average performance lead of 15-20 percent for the Mac.

Those performance levels do not only come from the G3 processor. Apple is the first company to use ATI's new Rage 128 graphics accelerator in its systems, and this provides excellent performance for 2D and 3D graphics applications.

Apple scores another first with the inclusion of two FireWire ports which provide data transfer rates of

400Mbit/sec. Digital video is an obvious application for FireWire but you will soon be able to buy portable hard disks that take their power directly from the FireWire port, and Apple hopes to kick-start the development of FireWire peripherals just as it did when it adopted USB for the iMac. The G3 PowerMacs also include two USB ports, but there's no SCSI port so users of existing SCSI peripherals will need an adapter if they want to continue using them. Some may also want to buy a new mouse or keyboard from a third-party, because the G3 systems are supplied with the same awful keyboard

**The performance of the G3 processor is pretty impressive**

and mouse as the iMac. The price of the system doesn't include a monitor so

you'll need to take that into account, too. Even so, these machines are competitively priced and no doubt there will be some good bundled packages available from Mac mail order companies.

Apple's pricing is surprisingly aggressive. The entry-level 300MHz model is faster than the previous top-of-the-range Power Mac but pricing starts at only £1,069 (ex VAT). The 400MHz top-of-the-range model starts at £1,699. The lack of SCSI and the toy-like mouse and keyboard will annoy some users, but these are minor irritations in relation to performance and innovative features like FireWire. Apple may win over a few PC converts who are bored with beige clone PC designs.

CLIFF JOSEPH



## PCW DETAILS

★★★★★

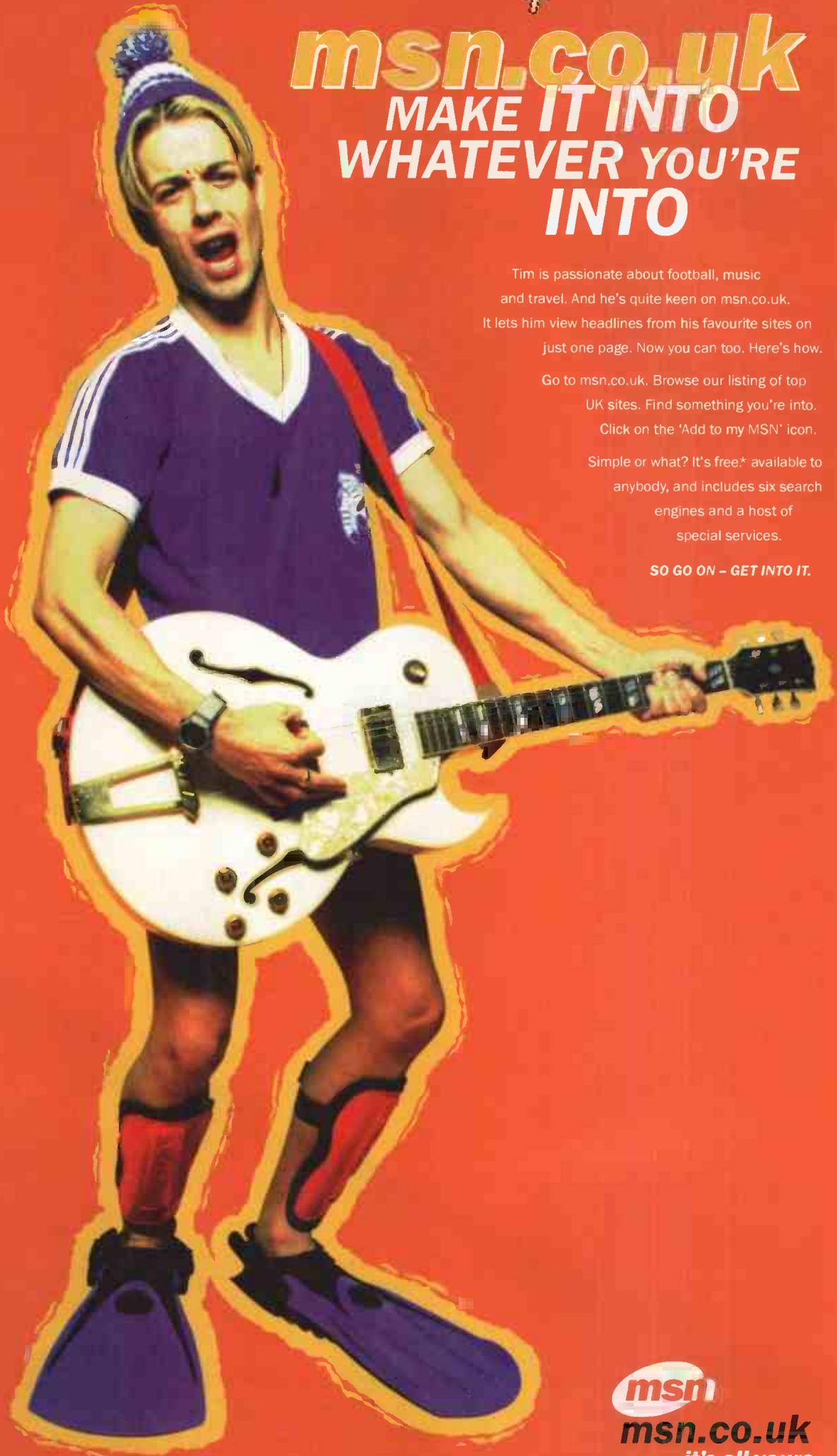
**Price** £1,585.08 (£1,349 ex VAT) for 350MHz model.

**Contact** Apple UK 0800 127753  
[www.apple.com](http://www.apple.com)

**Good Points** Speed. Built-in FireWire.

**Bad Points** Horrible keyboard and mouse. No SCSI.

**Conclusion** Not as cute as the iMac, but much faster and very good value for money.



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# Macromedia Director 7 Shockwave Internet Studio

No shock to us that this latest release makes Director **better and easier to use** than ever.

**D**irector uses a film metaphor with a stage, cast, script, score, projector and so on. The stage is the area that the end-user will see. The cast consists of elements comprising imported video files, animations, sounds and pictures from 40 different file formats. The score shows the movie being worked on and determines the length of the animation and at what points the cast members are visible. The script contains Lingo (Director's programming language), and Xtras which are programs written in C to extend the functionality of Director to provide specialist features. The drag-and-drop environment, when used in conjunction with the score, enables newcomers to build complex movies.

To reduce the need to learn Lingo, Macromedia has extended the built-in behaviour library. Behaviours can be dropped onto cast members, giving them complex functionality without the need for coding.

**Many of the new features** of Director Studio provide us with an awesome arsenal for internet development. If you've looked at interactive multimedia presentations on the web, the chances are that you were using Shockwave. Movies made in Director can either be saved as executable files or made into Shockwave movies. Shockwave, now updated to version 7, works in conjunction with your web browser. To reduce the amount of bandwidth used, only the information needed to play the movie is sent, so if you never click to see an AVI you won't have to wait for ages for it to download.

Shockwave ships with Windows 95 and 98 as well as being on the Netscape and Internet Explorer CDs. It has also been downloaded over 30 million times, making Director a worthwhile internet development tool. If you wish to avoid Shockwave you can always save in Java format, which will create a Java applet for use on the web, although not all of

## ...an excellent multimedia production tool

Director's functionality is supported.

However, if you're planning to push your movies to the limits, you're going to have to learn Lingo, but if you have any programming experience it's easy to pick up. It has matured into an excellent language with impressive functionality. Now incorporating dot notation, it should pose no problems for programmers

of C++, Java, Visual Basic and the like. Director appropriately colours the script to enable you to find things like keywords. But if you already work

in a colour-coded script environment, you can change them to match your standards. Although the Director 7 application is where all the authoring is performed, it also has built-in picture editing and vector design tools. The previous studio release had xRes (graphics) and Extreme 3D (raytracer). These have both been dropped in favour of Fireworks.

For creating web and screen graphics, Fireworks puts in one place all the tools at your disposal. You can create great effects on text and graphics, the objects are fully editable and the effect will update itself accordingly. Sound Forge

XP from Sonic Foundry is still included and the latest version (4.0d) is better than ever.

Director 7 Studio is an excellent multimedia production tool and nothing comes close to it in terms of power and ease of use. If you are serious about developing for the web, this is a 'must have'. Even if you already have Director, notwithstanding all the new features, just being able to use 1,000 channels – rather than the 120 in D6 – and animating at up to 999fps should be enough to warrant upgrading.

GORDON THORN



▲ DIRECTOR'S EXTENSIVE INTERFACE MAKES WORKING QUICK AND EASY

## PCW DETAILS



Price £938.83 (£799 ex VAT)

Contact Macromedia 01344 458600

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

**System Specification** Pentium 100MHz, Windows 95/98/NT4.0, 32Mb RAM, 65Mb disk space, SVGA 256-colour display.

**Good Points** Easy to use. Very powerful.

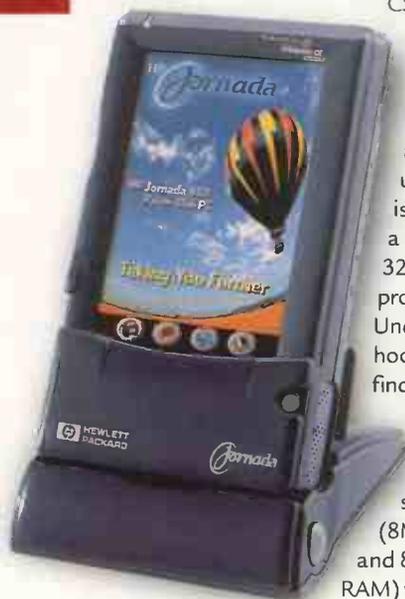
**Bad Points** None.

**Conclusion** If you're serious about multimedia, buy it.

# HP Jornada 420

It's a first! Here's **colour in the palm of your hand**, batteries included.

The world's first colour palm-held PC follows in the footsteps of its big brother, the 820e (PCW, February '99). The 240 x 320 pixel



CSTN screen displays 256 colours and the unit itself is driven by a 100MHz 32-bit processor. Under the hood you'll find 16Mb of memory as standard (8Mb ROM and 8Mb RAM) which can

be doubled at a later date. A Compact Flash slot in the top takes care of this, and also allows users to add a modem. External connectivity is either via the docking station which links it to a PC, or through the IrDA 2.1 port on the top which can be used to talk to GSM mobiles for managing phonebooks and downloading SMS messages.

Instead of hardware application buttons on the front (as on many vertical PDAs) there are four user-configurable 'hard icons', drawings on the bottom of the screen. Users of other handhelds such as the Cassiopeia E-11 should have no problems with the buttons along the left-hand edge, for attribute selection and one-touch audio recording. The built-in mic is extremely sensitive, the internal speaker is great — much louder than that found on many other PDAs.

Built-in software includes the usual CE applications as well as Omnisolve, a

financial problem solver. An application called bTask, which sits in your system tray, allows you to manage your active applications and saves the tedium of shutting each one down individually via the Settings panel. Hewlett-Packard claims a battery life of six hours, although it's not swappable with standard batteries, and has been thoughtful enough to bundle a rechargeable battery.

NIK RAWLINSON

## PCW DETAILS

★★★★★

**Price** £399 (£339.57 ex VAT)

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

**Good Points** Speaker and mic. Software extras. Rechargeable battery.

**Bad Points** Short battery life. Rechargeable battery cannot be swapped for normal batteries when it runs dry.

**Conclusion** Colour is nice, but in a Palm PC, is it really necessary?

# Epson GT-9600

A scanner for the pros. **Colour is what it's all about** — and in exceptionally high quality, too.

While most manufacturers are concentrating on the sub-£300 price point, Epson's latest scanner is targeted at the high end of the market, offering up to 3200dpi optical resolution with 36-bit colour output. The unit is substantial and considerably larger than the average desktop scanner at the consumer end of the scale. Its interface is SCSI, but includes an Adaptec SCSI-2



card and cable if you don't already have one. The supplied TWAIN Pro driver comes with its own separate manual and has a comprehensive feature set including the ability to manually adjust the scanner's focus. The unit also has a feature called Auto Area Segmentation which, when scanning in 1-bit monochrome, attempts to recognise photos and text, and adjust dithering modes to suit. In practice this worked tolerably well but dithered areas tended to overlap into the text. For OCR there's a text enhancement mode which thickens line width, making for slightly easier recognition.

If you're only going to do OCR and mono scanning, there's no point in spending £500 or more on a scanner. Colour scanning is what the 9600 is all about and here its definition and colour accuracy is most impressive. Intensity scales were spot on: black at zero percent

and white at 100 percent intensity, with a very linear response in between. Scans showed almost no sign of 'noise', giving an immediately smoother colour quality compared to cheaper units. Detail reproduction was also excellent in the higher-resolution modes.

The Epson GT-9600 should be on your shortlist if you're after a high-end scanner.

DAVID FEARON

## PCW DETAILS

★★★★★

**Price** £606.30 (£516 ex VAT)

**Contact** Epson 0800 220546  
[www.epson.co.uk](http://www.epson.co.uk)

**Good Points** Top-end quality. SCSI card included.

**Bad Points** Not exactly cheap.

**Conclusion** An excellent scanner for the professional, but the average user doesn't need this level of performance.

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(\*) Source: Contingency Planning.

- power surge and lightning protection for PCs and attached peripherals (printers, faxes etc.) from one Back-UPS Pro, which prevents burnt motherboards and locked-up keyboards reducing the cost of repairing or renewing your equipment,

- automatic saving of Microsoft Office files and graceful shutdown of the operating system in case of an extended power outage so that PCs don't crash unexpectedly and lose key data,
- hot-swappable batteries for easy and cost-effective maintenance,
- standard 2 years warranty.

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### Selection Table

Back-UPS Pro® Runtime in minutes			
Application	Back-UPS Pro 280	Back-UPS Pro 420	Back-UPS Pro 650
Desktop Pentium w/14" Monitor	14	20	44
Mini Tower Pentium II w/15" Monitor	10	17	35
Tower Pentium II w/17" Monitor	6	12	23

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Phone : \_\_\_\_\_ Fax : \_\_\_\_\_ E-mail : \_\_\_\_\_

PC brand used : \_\_\_\_\_ # of PCs on site : \_\_\_\_\_

UPS brand used : \_\_\_\_\_ # of UPSs required in the next 6 months : \_\_\_\_\_

# Adobe Acrobat 4

## Electronic publishing



The latest version makes it even easier to **publish information on the web.**

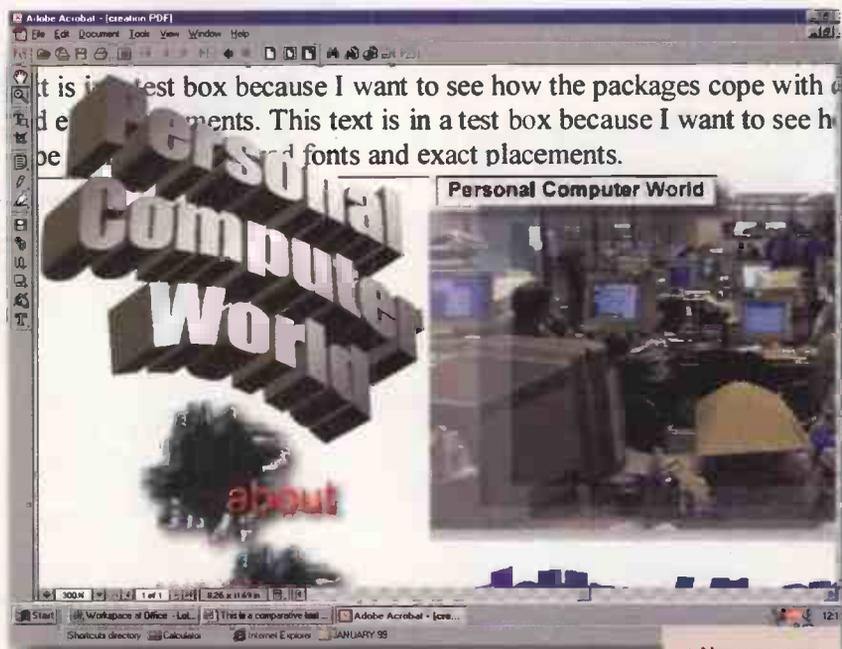
Anyone who has used the internet will have come across a PDF (Portable Document Format) file. Traditionally generated using Adobe's Acrobat, it allows the distribution of documents, compressed but resembling their original format, without expecting the recipient to own the originating software. All that is needed is the Acrobat reader.

PDF files are perhaps most popular on account of their platform neutrality and the fact that nearly everyone seems to have a 'reader'. Whereas Acrobat 3 was PostScript Level 2 compliant, this new release instead uses PostScript Level 3 to generate PDF 1.3, an even more compact file.

A number of new annotation tools are incorporated in version 4. These allow you to make more extensive notes and attach them to a document. A new 'stamp' tool lets users stamp a variety of slogans onto the PDF pages. Unfortunately, these stamp on top of the text rather than laying underneath and leaving the text legible. Annotations are indexed in the left-hand margin. The formerly flat menu has been replaced by a series of tabbed pages for thumbnails, bookmarks (internal hyperlinks), annotations and signatures.

**Signatures is a new security feature** which ensures no unauthorised changes are made to a document. It can also be used to prove that a particular person has read and approved a certain file. The digital signatures can be represented by anything from a logo to a scan of an actual signature. Users can view any and all changes that have been made since a document was signed.

It is no longer necessary to print to PDF from an application or generate it from a PostScript file printed to disk. The Acrobat creator can instead open a wide variety of file types directly and translate



them to PDF on-the-fly. Compatible file types include WordPerfect, Excel, PowerPoint and Frame Maker, but RTF files have been overlooked.

Entire web sites can be encoded when opened in the Acrobat writer which can then be set to download just the selected page, a number of set levels, all pages under that level on the same server, or an entire site. Excessively wide contents can be automatically scaled to fit within the selected paper size and, if scaling falls below a certain level, it can be set to intelligently switch from portrait to landscape mode. Form elements will be translated into Acrobat-compatible forms, and all hyperlinks will be enabled.

Using the freely downloadable 'reader', copying text is now much simpler, as is scrolling through a document. The now familiar dragging hand icon can incorporate a downward arrow to indicate that simply clicking the page will advance it one full screen at a time.

Other new features include support for QuickTime 3.0 in linked video clips, improved late-stage editing proofing tools, smoother shading, easier text and

table extraction from finished documents, and an improved user interface.

This is a major and welcome upgrade to what was an already impressive product. Those who use earlier versions of Acrobat will be pleased with the new features, while for those who were undecided upon its implementation, this latest version should be the only justification needed.

NIK RAWLINSON

**▲ NEW FEATURES ENSURE SMOOTHER TEXT CURVES AND MAKE VERSION 4 EASIER TO USE**

*...a major upgrade of an already successful product*

### PCW DETAILS



**Price** Full version £186.83 (£159 ex VAT); upgrade £57.58 (£49 ex VAT).

**Contact** Adobe 0131 458 6842  
[www.adobe.com](http://www.adobe.com)

**System Specification** 486 or Pentium processor, Windows 95/98/NT4, 8Mb RAM for Reader under Windows 95/98 (16Mb under Windows NT), 8-16Mb RAM for Exchange, 16-24Mb RAM for Capture plug-in and Distiller.

**Good Points** Small output files. Easier than ever to use.

**Bad Points** No RTF text import.

**Conclusion** The essential addition to any publishing/web authoring toolbox.

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\*Details of offer: EPL-5700 Laser Range = FREE Stylus Color 440 Inkjet. EPL-N1600 Range = Stylus Color 640. EPL-N2000 Range = Stylus Color 640. EPL-N4000 Range = Stylus Color 640. EPL-C8000 Range = Stylus Color 740. Subject to availability. Offer applies to purchases between 1st Feb and 30th April. All claims must be made by 30th May. Claims to be made using voucher inside laser printer box.

**EPSON**<sup>®</sup>

# HP DeskJet 695C

HP gets curvy on us with a makeover of **an old favourite**.

As part of Hewlett-Packard's range revamp, the world's best-selling printer, the 690C, has been replaced by the 695C. Before anyone gets too enthusiastic, the 695C is essentially the 690C with a redesigned shell. It seems that the HP design team wanted a more modern and curvy look, but inadvertently made it look worse than the original. We thought it looked a bit ugly from all angles, compared with the old model.

The brilliant setup guide makes the procedure extremely simple. We appreciated finding the usual mechanism that slides the cartridge holders into view as soon as the top cover is opened. After installing the mono and colour cartridges, the 695C spends a couple of minutes cleaning the heads. The process of installing the drivers (supplied on CD and floppy diskettes) is also very easy, with just a few clicks and a reboot.

The performance score of 74 percent is unusually low because the 695C is let down by its disappointing colour output. It was very grainy and displayed horizontal banding. There is always the option of using the photo cartridge with glossy paper, which should improve the results.

On the other hand, mono text and graphics are excellent. Small fonts are printed with good clarity, and mono images had particularly good contrast. The 695C, along with several other HP printers, fared less well in the thin-white-line-through-solid-black-box test, only managing the thickest white line out of four. Speed tests revealed 1.88 ppm in normal mode for 10 pages of text. HP claims 3ppm for this mode, so this is a little disappointing. In the positional test, we were impressed that the hairline cross-pattern was overprinted with no noticeable error.

JAMES MARTIN



## PCW DETAILS

★★★★

**Price** £151.58 (£129 ex VAT)

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

**Good Points** Uses HP's REt and ColourSmart. Low price.

**Bad Points** Uninspiring colour output.

**Conclusion** At £150, this printer could be ideal for first/second-time, cost-conscious buyers who want a reliable printer that has the ability to print in colour.

# Lexmark Photo 5770

A printer designed specifically for **digital photography**.

As far as features are concerned, the 5770 is packed to the gills. Lexmark claims that it is the world's first printer designed specifically to meet the demands of digital camera photography. Slots for CompactFlash

and SmartMedia cards allow direct printing without the need to first download pictures to your PC. Picture sizes range from thumbnails to full A4 sheets for maximum versatility, and it even allows users to transfer images from memory cards directly onto a Zip drive attached to the parallel port.

Lexmark enforces the printer's built-for-photographers image by including a photo cartridge but no black cartridge. This could mean ink wastage if you print a lot of text and exhaust the black ink before the cyan and magenta. Even so, the quality of black text on photocopy paper is excellent, although it did take its time to appear. At the lowest resolution of 600dpi, our five-page business letter arrived in 3min 54sec. Upping the resolution to the 1200x1200 dpi maximum increased this to 14min 20sec.

On Lexmark photographic paper, our photo showed evidence of very fine, slight banding. Skin tones were a little orange, but solid colours were handled well. We were pleased that unbroken black did not bleed into the lighter colours it bordered, but were worried that several hours later our paper was still a little tacky. Users can choose from a range of six paper types in 19 sizes, supplemented by a custom option.

NIK RAWLINSON



## PCW DETAILS

★★★★★

**Price** £349 (£297.02 ex VAT)

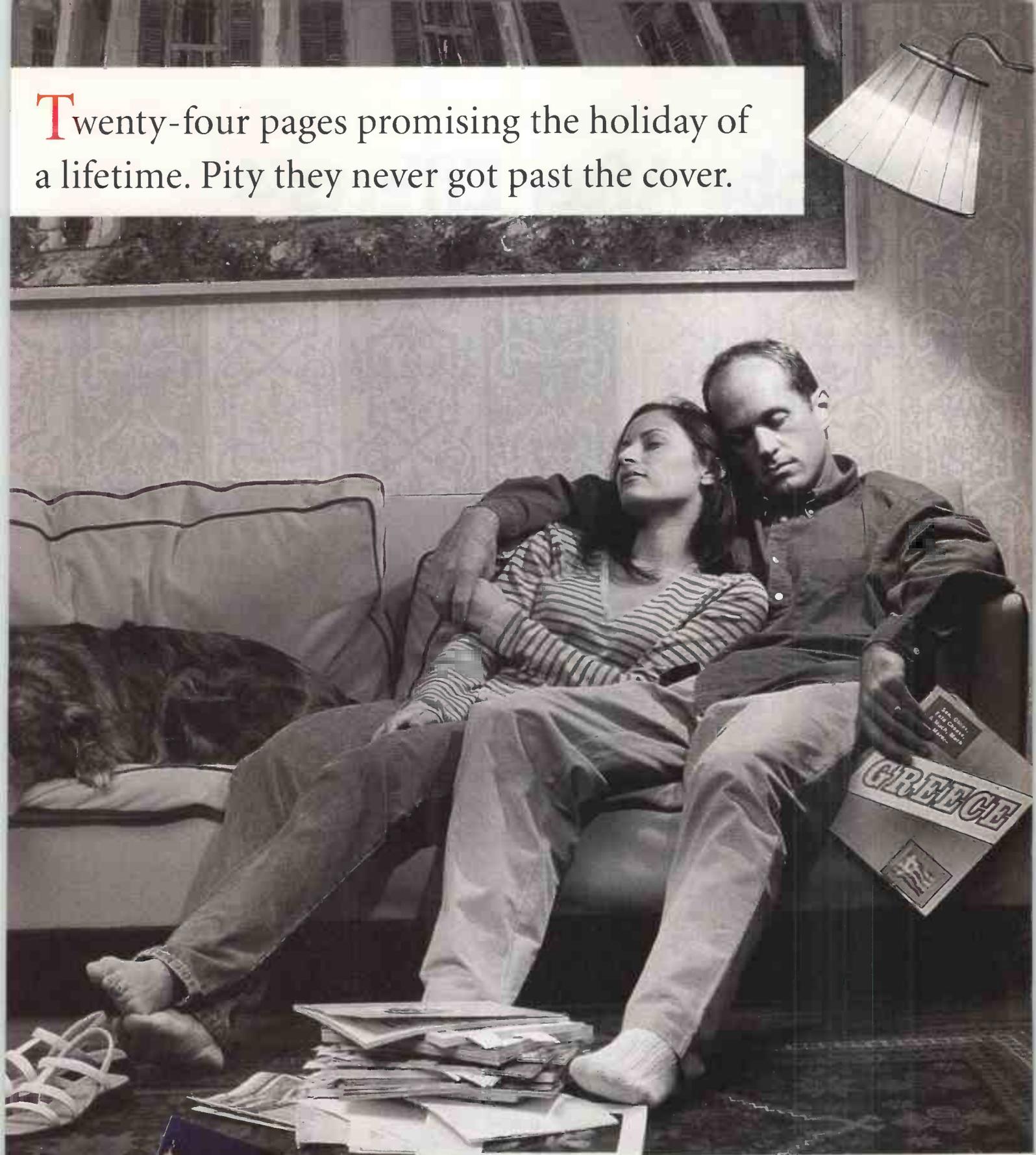
**Contact** Lexmark 01628 481500  
[www.lexmark.co.uk](http://www.lexmark.co.uk)

**Good Points** Photo reproduction. Direct CompactFlash/SmartMedia access.

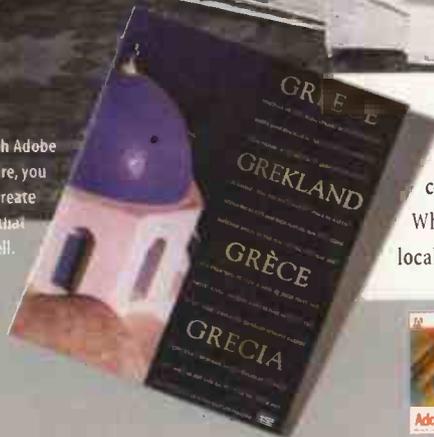
**Bad Points** Price. No black cartridge as standard.

**Conclusion** If you print a lot of photos, it's worth considering.

Twenty-four pages promising the holiday of a lifetime. Pity they never got past the cover.



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# Adobe After Effects 4

## Very special effects

**A**imed in part at motion picture houses, video production companies and 3D animators, After Effects is nonetheless not a digital video editing package. It is, rather, a package that will bring 2D flat images to life with zooms, filters and the sort of flying layers seen on TV news.

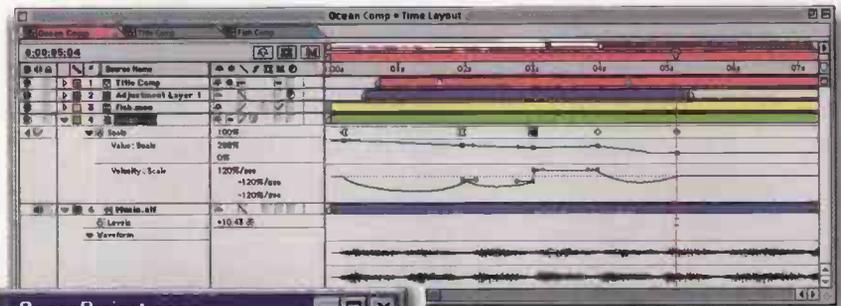
It's hard to know where to start describing the myriad new features in Adobe After Effects 4.0. It's been a long wait for this upgrade but the After Effects team have more than made up for it, packing their product with enough new features to keep even the most discerning user happy.

**The first thing you'll notice** is the new interface, sporting tabbed palettes which allow you to view all open compositions through a single window. As you click the tab, in the Time Layout window or the Composition window, all other windows are updated automatically. All windows and items have context-sensitive menus to save on trips to the main menus; managing projects has never been easier.

It's always been a great advantage to import Photoshop files as compositions, layers intact. This feature has now been extended to include all of Photoshop's Transfer modes, Adjustment layers, Type layers and Effects layers. These can now be imported and animated over time in After Effects — it's like Photoshop on wheels! The same goes for Illustrator compositions: they too can be imported with layers intact, allowing you to achieve the highest quality when scaling your footage.

My favourite new feature is Adjustment layers, which you may be familiar with from Photoshop. Apply multiple effects to an Adjustment layer and they will affect every layer beneath it. This means I can apply effects globally and really save on render times. It also allows me to apply effects to Illustrator files without losing the ability to continuously rasterise them. By applying masks to Adjustment layers I can select areas for the effects to be applied to.

Up to 128 masks can be added to any



layer, and can then be stroked and/or filled. The interpolation for mask animation has been much improved since version 3.1: you can even add new points during the animation, and After Effects will correctly calculate the number of points needed to make the change. The Free-Transform tool with which you may be familiar in Photoshop or Illustrator is now available for you to use in After Effects, allowing users to quickly adjust points on a mask.

There is a host of new filters in After Effects 4.0, including the Reshape filter, used when morphing footage from one shape to another. Paths from either Photoshop or Illustrator can be used as your shapes, or you can create your own within After Effects. You can also distort pixels using the Mesh warp filter, which places a customisable mesh over your image, allowing you to drag the 'bezier-style' points and handles to achieve precise distortions.

Audio capabilities have been improved beyond recognition, audio scrubbing is now extremely accurate, and a whole host of new audio filters have been provided for your delectation.

You can even use your Premiere Audio filters in After Effects 4.0.

The new RAM preview is a vast, time-saving feature in After Effects 4.0. By pressing the RAM preview button, you can load frames into RAM and they will be played back in real time, within After Effects. No longer will your hard drive be cluttered up and fragmented by having to create test-renders of your movies — you can now do it all within After Effects.

There are, however, a couple of disappointments in this upgrade. There are no new painting tools, which is astonishing, coming from the company that owns Photoshop. Neither is there RLA file support or eagerly awaited Z-depth, although the API has been extended, implying that developers of plug-ins may now be able to fill this gap.

Despite the absence of these features, After Effects 4.0 remains a massive time- and money-saving upgrade, with plenty of new features. Buy it today!

ANGELA TAYLOR

### PCW DETAILS

★★★★★

**Price** TBC, but around £500 ex VAT (standard), £1,000 ex VAT (production).

**Contact** Adobe 0131 458 6842  
[www.adobe.com](http://www.adobe.com)

**System Specification** Pentium processor, Windows 98/NT, 32Mb RAM (64Mb for Windows NT), QuickTime 3.0 or later, CD-ROM drive, 80Mb free hard-disk space, 16-bit video card.

**Good Points** Real-time RAM preview and frame caching. Improved user interface with tabbed palettes. Adjustment layers.

**Bad Points** No Photoshop-style paint tools. No RLA support or Z-depth.

**Conclusion** Opens more creative avenues.



**Crash.**



**Boom.**

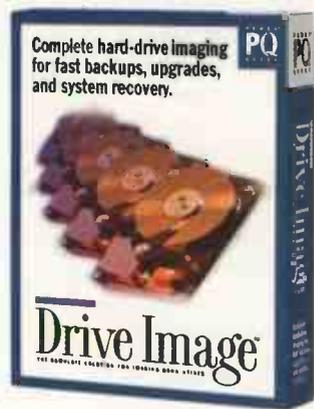


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# WordPerfect Office 2000 Suite thing

**Corel provides a good value alternative to Microsoft.**

**W**ordPerfect Office 2000 has a great new feature called Install-as-you-go. Instead of having to choose all the features you think you might need on first installation, Install-as-you-go shows a complete user interface, but not all features are actually installed. Choose one of these missing features, and the installer pops up automatically to load it from the CD.

The very same feature is in Microsoft Office 2000, suggesting that office-suite vendors spend much of their time eyeballing the competition. Currently Microsoft has most of this market, particularly in the corporate world, but Lotus and Corel are challenging that dominance with new suites that provide similar features at a substantially lower price. Prices for the new WordPerfect suite are not yet announced, but if the old version 8 is any guide, expect it to be around half of what Microsoft will want for Office 2000.

**The core applications** here are WordPerfect 9 itself, the Quattro Pro spreadsheet and the Corel Presentations graphics package. Paradox 9 is the database manager, and it's only available in the Enterprise version of the suite. CorelCentral 9, present in all versions, is a personal information manager that includes a simple cardfile database. Other supporting applications, not necessarily in all editions of the suite, are the Trellix 2 hypertext authoring tool, NetDocs for publishing documents to the web, Corel Versions for version control of WordPerfect documents, and several tools aimed at system administrators. Dragon Naturally Speaking 3, not available for testing in this Beta, is a bundled voice recognition system with a claimed potential for dictation into WordPerfect of 160 words per minute. We'll be both surprised and

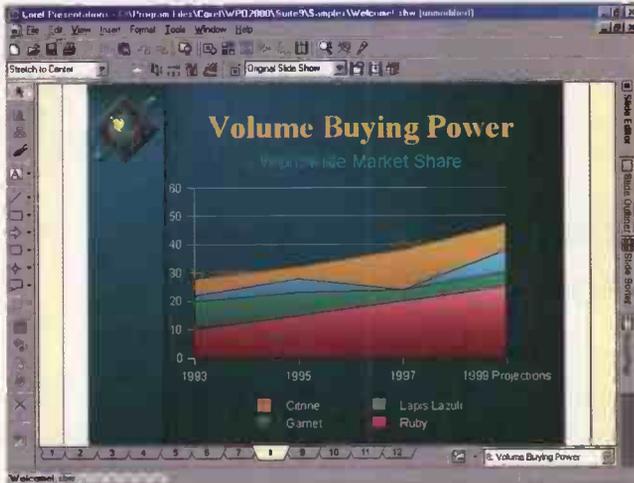
## *The most distinctive new feature in WordPerfect Office 2000 is Trellix*

impressed if the final version delivers half that rate with usable results. Online help is in the old Windows help format, as Corel has chosen not to use Microsoft's new compiled HTML help. Although the new format has some advantages, the old style has better performance and users will be happy with Corel's decision.

The most distinctive new feature in WordPerfect Office 2000 is Trellix, a little-known third party application that most people will use as a web authoring tool, although it also has its own document format. The Trellix editor shows three main elements. The Map shows the whole document in thumbnail form, with one-click access to any page. The Outline shows the structure of the document in a tree-view outline format. The Page Editor is for managing the content, including text, images and

hyperlinks. Trellix fits with the web model, where the user determines the viewing order, as opposed to word processors that create traditional sequential documents. The snag is that while Trellix manages hyperlinks well, there are better web authoring tools around. It will struggle to find a niche, although exposure through inclusion in this suite gives it a better chance.

Developers will be pleased to find Microsoft Visual Basic for Applications



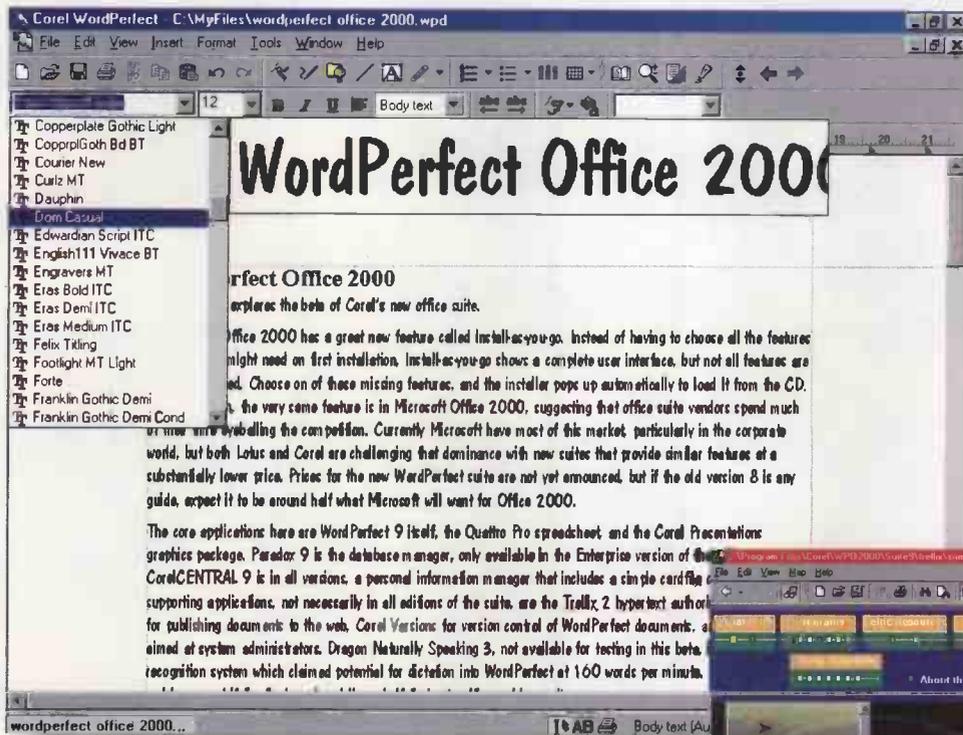
**◀ COREL PRESENTATIONS IS AN ADEQUATE PRESENTATION GRAPHICS PACKAGE, BUT LITTLE IS NEW IN THIS VERSION**

embedded into WordPerfect Office 2000. The VBA environment is essentially the same in both Microsoft Office and

WordPerfect Office, and it makes both suites powerful tools for developing custom solutions. There are two disappointments, though. First, VBA has not made it into Paradox, where advanced users still have to learn ObjectPal. Second, the object model exposed by WordPerfect is all but non-existent. Instead of a properly structured set of objects, there is just one PerfectScript object with hundreds of methods. This is a symptom of the transition from one macro language to another. Corel is moving in the right direction, but for now Microsoft Office remains the best for developers.

**WordPerfect is the jewel in the crown**, and stands up well against the competition. Users will not find much new in this release, which fits with Corel's announced intention to concentrate on stability and performance rather than new features. The file format is unchanged, and in fact has remained the same since version 6.1, a real advantage for users exchanging documents. Font enthusiasts can choose from over 1,000 fonts on the installation CD, a typically generous Corel bundle.

RealTime preview is a feature that lets you see changes before they are applied. If you pass through Greek and Hebrew fonts while looking for Times New Roman, for example, this can have strange and distracting results. The feature can be disabled.



More helpful are some handy new navigation options, and more interesting are the enhanced XML (Extensible Markup Language) and SGML (Standard Generalised Markup Language) capabilities. XML is a simplified version of SGML and is intended to become the eventual successor to HTML on the web. Used properly, these standards improve on standard word processor documents because they enforce meaningful structure. You can see an example of this in HTML, where the <EM> tag means not bold, but emphasis, the idea being that emphasis can be implemented in different ways by different browsers or browser settings. WordPerfect 2000 supports XML documents, although the features did not work in our Windows 98 Beta installation.

Quattro Pro 9 remains an excellent spreadsheet, although again, new features are not prominent. If you yearn for larger spreadsheets, Quattro Pro meets your need by allowing for around one million rows, 18,000 columns and 18,000 sheets, although you would not get far if you tried to fill such a sheet with data. This is many times larger than the previous version's maximum. There is also a new Dynamic Cross Tab Report, which the reviewer's guide observes is like an Excel Pivot Table, a popular Excel

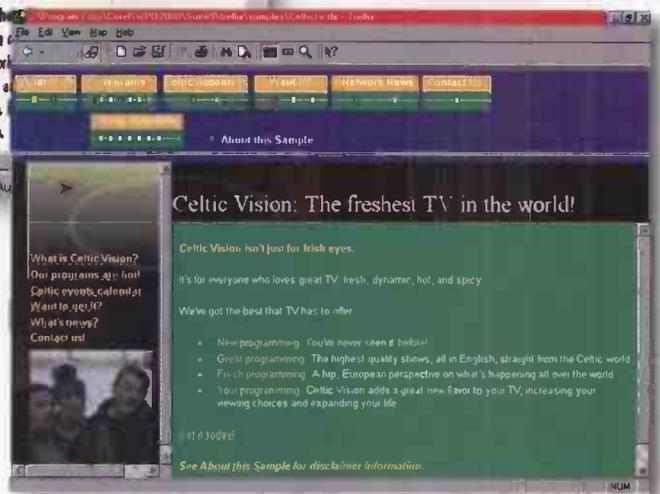
feature that is welcome in Quattro Pro. Paradox 9 has a range of new usability features, but the real interest is not really a feature of Paradox at all. This is the Web Form Designer, a separate Java application that allows you to construct database forms as Java applets. There is also a JDBC (Java Database Connectivity) driver for the BDE, the Paradox database engine, so using this technology you can host live database forms in web pages, although we could not make a successful connection using the beta. The form designer is impressive, with a rich set of widgets available, using Java's new Swing user interface components. This suggests Corel's investment in creating a Java office suite is not completely lost, though whether this is the ideal way to present

data on the web or an intranet, is doubtful.

Is this the best office suite? If

choosing a new suite in isolation, it is an excellent choice, and although Microsoft Office arguably has the edge in usability, it isn't worth twice the price. Changing from one office suite to another is not easy though, and unless you need a particular feature such as SGML editing, there is little reason to

◀REALTIME PREVIEW IS A NEW FEATURE THAT DOES STRANGE THINGS TO YOUR DOCUMENT WHILE YOU HUNT THROUGH THE FONT MENU  
▶TRELIX IS FOR AUTHORIZING HYPERTEXT DOCUMENTS. MOST WILL USE IT FOR WEB AUTHORIZING



switch. It will also be important to assess the reliability of the final code, as the beta proved far from stable, particularly in the newest features. Finally, Corel's commitment to supporting multiple platforms, including Mac, Unix and Linux, is significant in environments where Windows is not the only system in use.

TIM ANDERSON

**The form designer is impressive, with a rich set of widgets**

## PCW DETAILS



Price TBA

Contact Corel 0800 973189

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

**Good Points** Unchanged WordPerfect file format. Innovative Java and XML support. Value for money likely to be excellent.

**Bad Points** Typical users will find few compelling new features. Microsoft Office has the edge in usability and polish. Poor initial implementation of Visual Basic for Applications.

**Conclusion** Great value for new users, assuming the final version proves to be robust.

## PULSAR C400

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- 56K Modem
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\*Software bundles vary according to model. Value of software based on separate selling price of actual or equivalent software, less value of manuals not included for pre-loaded software.

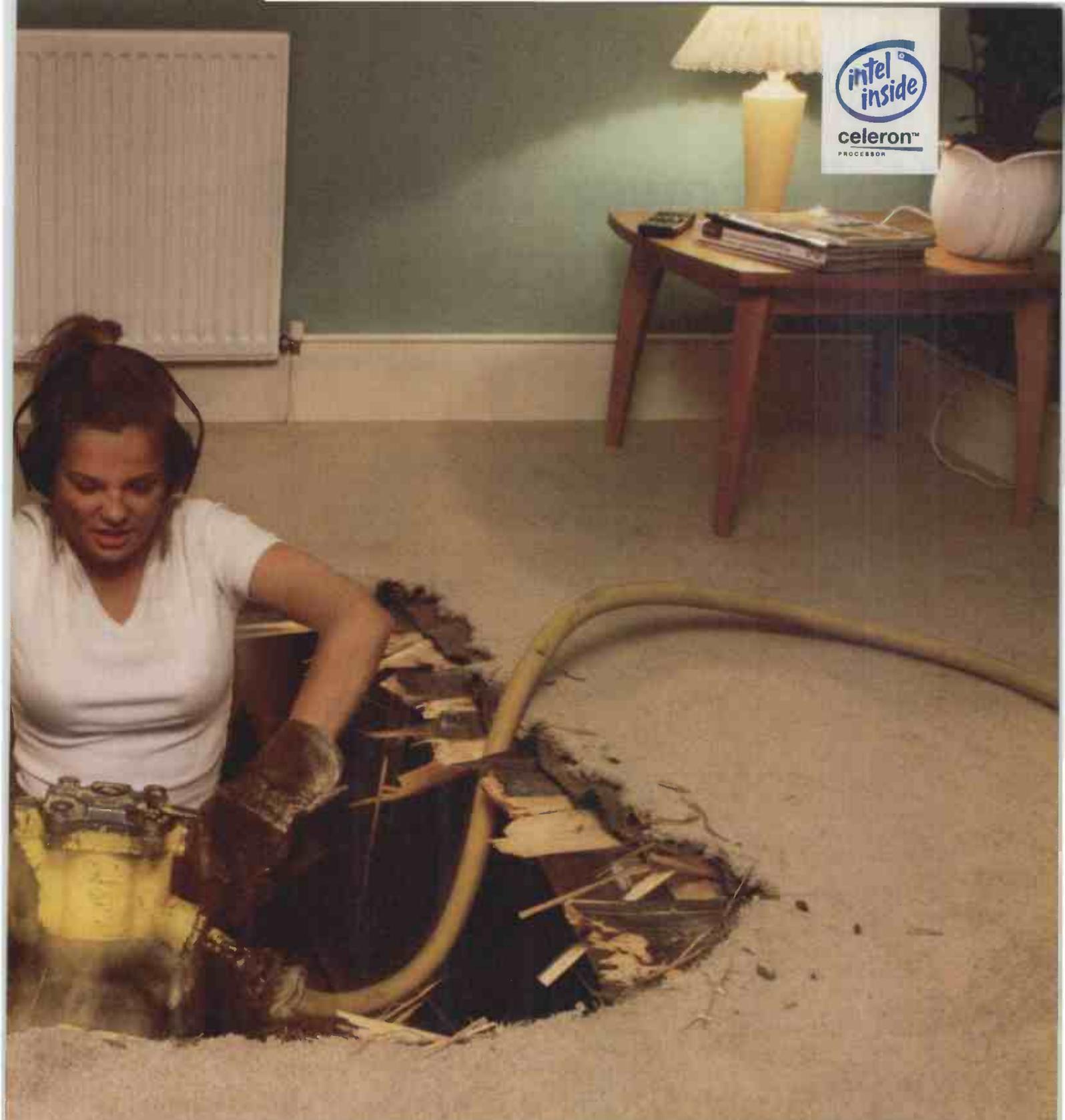
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# Kai's Power Tools 5.0

## Plug-in weirdness

**Essential and eccentric,** the new Power Tools will enhance your creativity.

**D**on't worry, you haven't missed out on a major version release of Kai's Power Tools (KPT). MetaCreations has simply jumped from version 3 to 5 to keep in line with the current versions of Photoshop and Painter.

Version 5 makes a clean break with the past both in terms of content and presentation. None of KPT 3's filters appear in 5, unless you count the entire KPT 3 suite which is included free of charge on the CD. Also gone, for the most part, is the wacky interface with its genetic mutations. In its place is a cleaner, more easily understandable layout of panel-based controls and preview windows. You can re-arrange the panels in the work area, and the size of the preview panel is adjustable to take account of your monitor size and the speed of your system.

**KPT is essentially** a suite of ten image editing plug-ins — ShapeShifter, RadWarp, FraxPlorer, FraxFlame, Frax4D, Orb-It, FiberOptix, Blur, Noize and Smoothie. The first of these is the most useful and the one that web designers in particular are going to find indispensable. ShapeShifter is, among other things, the consummate web



images, as well as any parameter controls available, and the expanded state displays two slider controls that let you set precise

button designer. It allows you to create 3D objects with bevelled edges from nothing more than a selection mask.

ShapeShifter creates bevelled objects from an active selection or imported mask. So, for example, using a text selection results in the bevel style being applied to each letter. There are two preset bevel profiles: arc, which provides a smooth-edged bevel; and diagonal, which provides smooth, angled plateaux along the edge of each shape.

Of course there isn't an image editor around that can't produce bevelled buttons. The KPT difference lies in the ease with which you can create extraordinary-looking graphics and the degree of control you have in the process. Just drawing a circle with the ellipse selection tool and hitting the ShapeShifter button produces a Smartie shape that looks good enough to eat. Seven panels give you ample opportunity to go much further.

The main shape panel is where you adjust the bevel profile, using either of the two presets already mentioned or creating your own. Here you can also adjust the height and scale of the bevelled edge. Each panel has four states: collapsed, preview-only, standard and expanded. In preview-only state, the panel displays a preview thumbnail of any imported images, masks or presets you're currently using. The standard state displays a preview of any imported

values for each control in the panel.

You can set lighting next using the 3D lighting panel. Here you can add, remove and position light sources, change their colour and brightness and play with sliders controlling highlight sheen and spread.

**The Environment panel** lets you load images that are used as environment reflection maps, producing metallic or plastic-like surfaces, and you can import bump maps to add texture to surfaces. One very useful feature is the ability to add a second 'top mask' shape that can be used to add text to a button or to build a more complex shape. Final touches can be added using the drop shadow or glow panels.

**ShapeShifter is only a tenth** of what KPT has to offer. Three of the filters are based on the fractal patterns that can be produced from formulae devised by mathematicians Benoit Mandelbrot and Gaston Julia. Fraxplorer allows you to zoom into the image as it's being created, a sort of fractal fly-through, and you can generate shapes, thorns, ribbons and bubbles, on top of the fractal, all in real time.

Even if you never make productive use of any of the remaining goodies, you'll have a lot of fun with them. And the other stuff is worth the price on its own.

KEN MCMAHON

### PCW DETAILS



**Price** £151.58 (£129 ex VAT); upgrade from version 3, £69

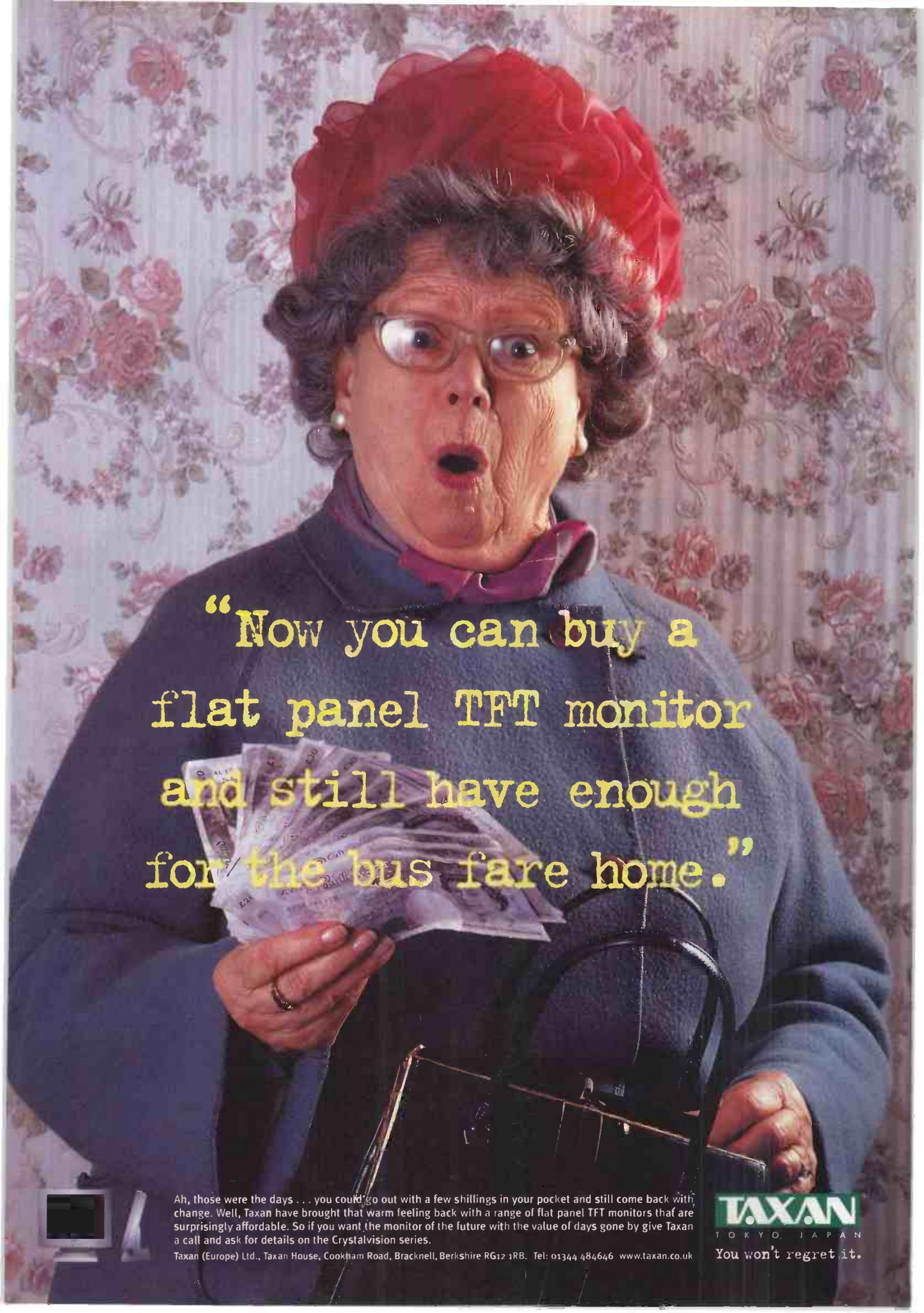
**Contact** Computers Unlimited  
0181 358 5857 [www.metacreations.com](http://www.metacreations.com)

**System Specification** Pentium 166MHz (or compatible) or faster, Windows 95/98/NT4, Photoshop 3/4/5 or 100% compatible host, 32Mb RAM, 50Mb free hard-disk space, 24-bit colour video, colour monitor, CD-ROM drive.

**Good Points** The superb ShapeShifter and wild, wonderful fractal fun.

**Bad Points** It looks good, but is it any use?

**Conclusion** Buy it for the ShapeShifter, have fun with the rest.

A woman with a surprised expression, wearing a red hat and glasses, holding a large stack of banknotes. The background is floral wallpaper.

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# Mesh Elite PII UB High-scoring PC

Mesh takes advantage of USB to provide **quality and value.**

**U**SB is fantastic, there is no doubt about it. It removes much of the hassle associated with adding new peripherals by simply allowing people to plug them in. You don't even need to worry which port you plug a peripheral into — USB simply doesn't care. Even better is the fact that devices plugged in after the computer has been turned on are instantly recognised. With support for up to 127 devices simultaneously, ranging from keyboards and mice all the way up to CD-ROM drives, and the fact that you no longer need to worry about IRQs or memory addresses, USB is the most flexible way of adding extra functionality to your PC.

Now that USB devices are more commonplace, Mesh has provided us with its first USB machine, containing as many USB peripherals as could be squeezed in. Gone are the standard mouse and keyboard, replaced instead with their USB equivalents. The Logitech USB mouse in particular is great, especially for games players, as it offers a more fluid movement than the old standard.

Also included in the bundle are USB speakers, which mean that you don't need a sound card in order to get sound. In this setup the sound is sent digitally to the speakers, which themselves contain the digital audio converter. As a result, the sound is clearer, with less equipment inside the PC to interfere with it.

The only problem here is that you can't record, so Mesh has facilitated this through the inclusion of a Sound-Blaster Audio PCI. It's a shame this limitation of USB in general has yet to be overcome.

One problem with USB is that you can easily run out of ports, as most products don't contain a throughput. Mesh got around this by supplying a hub as part of the 17in Taxan monitor.



This gives you an extra four ports for any additional peripherals you might want, and as an added bonus it doesn't take up any extra desk space.

**The heart of the machine** is a Pentium II 450 providing enough raw power to watch films on the bundled DVD-ROM drive. Graphics are also well specced with a 16Mb Hercules TNT AGP card, which is currently just about the fastest graphics card you can own.

With the internet being as popular as it is, the machine comes with a Diamond Supra 56K internal modem, allowing you to get connected from day one. Storage space is going to be no problem. In addition to the huge 13Gb ATA-66 hard drive, you also have a 2Gb Jaz drive. There's a SCSI card, too, for the Jaz, which allows end-users to add further SCSI devices at a later date without this potential extra cost. It's a shame Mesh didn't include a SCSI hard drive, too, but then, that would have increased the cost.

Mesh has done its usual job of providing a PC with superb quality of build. The cables are neatly tied out of the way, allowing easy access to the processor and DIMM slots, should the 128Mb of RAM provided on just one DIMM, leaving two slots free, prove insufficient. Expansion-wise you have two

ISA slots and the shared slot free, leaving you room to play with.

For the price you pay, you get a good deal. All of the components included are of a very high standard, and this shows through in the performance scores. If you want a head start on the latest technology, you could do a lot worse than buy this Mesh.

DAVID LUDLOW

## PCW DETAILS



**Price** £1,878.83 (£1,599 ex VAT)

**Contact** Mesh 0181 208 4706

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

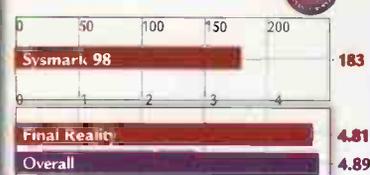
**Good Points** Superb components.

Three-year warranty.

**Bad Points** None to speak of.

**Conclusion** A top-notch system with superb components.

### PERFORMANCE RESULTS



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<sup>1</sup>Includes any applicable set-up charge but not introductory offers.

<sup>2</sup>CompuServe prices are set in US Dollars and converted at prevailing exchange rate.

<sup>3</sup>Prices based on lowest tariffs available for hours on-line. Information correct at time of going to press.

<sup>4</sup>Free 1 month trial only available on single access dial-up accounts for credit card holders.

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# Phenom Express

## Next-generation computer

**Is it a PDA, is it a laptop?** Whatever it is, it's an exciting development.

**T**he Phenom Express is one of the new generation of computers. At 23.5x15x2.8cm it is too big to be a traditional PDA and too small to be a laptop. The burning question is whether it succeeds as a useful computer, or ends up falling inelegantly between two stools.

First, the spec. The basic machine is supplied with 16Mb of RAM, an Hitachi SH3 processor running at 100MHz, and Windows CE 2.0. By the time you read this it should be shipping with Windows CE 2.1 and a 32Mb version may be available at extra cost. The screen is half VGA and at 19.5x7cm is huge for a PDA. It is well back-lit and remains readable under all reasonable conditions.

The Phenom Express is styled in an idiosyncratic way; we happen to really like it, but not everyone to whom we showed the machine agreed. Less contentious is the fact that the design is fiendishly clever. For example, the odd, silver tube affair at the back of the machine is the detachable battery pack. Mounting it here, behind the screen, helps to ensure that the machine doesn't tip over when the touch-screen is used. In addition, the battery can be hinged down to provide a stand, ensuring that the keyboard is tipped to a comfortable angle. Hinging the battery pack down also reveals the 25-pin, D-type serial port and the VGA output for driving a conventional monitor.

The VGA output seems almost too good to be true and... it is. There is a VGA port, and it will drive a monitor (also including, presumably, the usual range of

projection equipment). However, this port will, bizarrely, only work when you're using Microsoft Pocket PowerPoint. No, we don't

understand this restriction, and LG was unable to explain it. Still, the built-in screen really is so good that we didn't feel the need to use a conventional monitor, and the port does mean that you can use the Phenom to give presentations, so this feature is a bonus rather than a serious restriction.

Something that is too good and is also true is that the Phenom has a 56K fax

modem built-in — oh, and an infra-red port. This machine just bristles with highly usable extras fitted as standard and even the standard-standards are good. The size of the machine allows an 80 percent-sized keyboard, which is a delight. We have always liked the Psion 5 keyboard, but this one is noticeably larger and quite definitely better.

Battery life is claimed at between five and ten hours. Hmm. We got five hours of continuous use; fewer when the machine was used less frenetically,

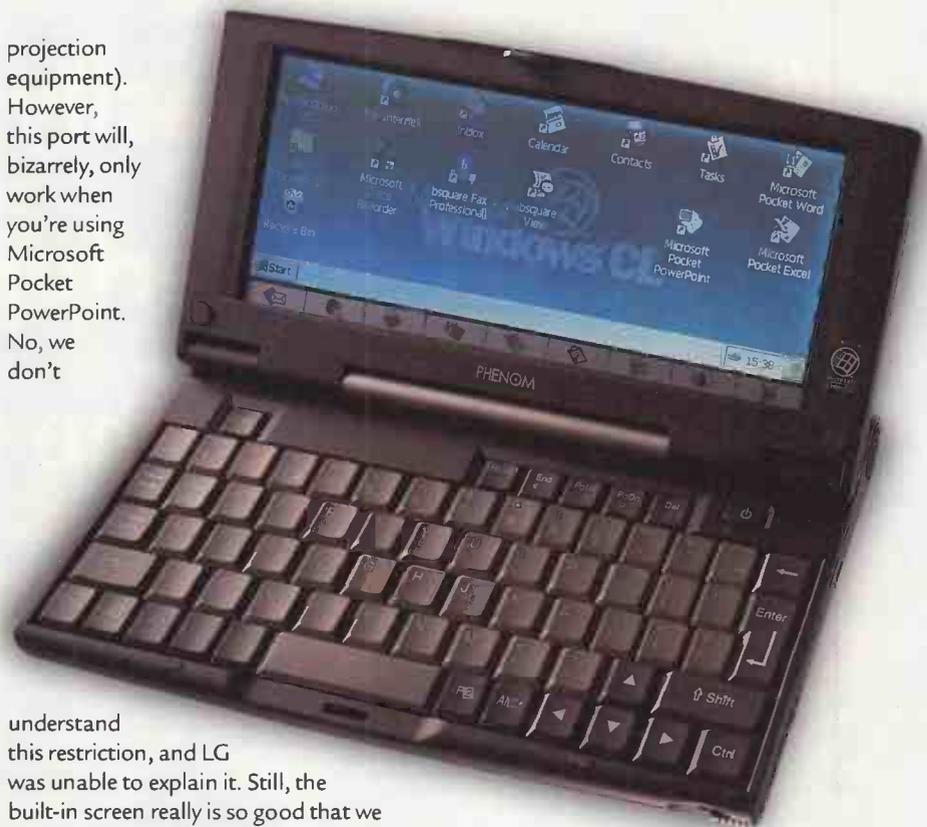
presumably because the battery power was used to keep the memory alive in the interim. The good news is that the rechargeable battery pack, being Li-Ion, doesn't suffer from memory effects

and so can be recharged at any time. In practice, given normal use and recharged every night,

the battery life is fine. Long journeys would benefit from a spare battery. On the test machine, the fax modem gave warnings about low power even with fully recharged batteries, so you will need to carry the power supply for faxing.

The final analysis is that the Phenom is indeed neither PDA nor laptop. The great news is that it is something else again, and that 'something' combines many of the best features from both of its progenitors.

MARK WHITEHORN



***This machine just bristles with highly usable extras fitted as standard***

### PCW DETAILS

★★★★★

**Price** £599.00 (£509.79 ex VAT)

**Contact** LG; 01753 500400

[www.lgphenom.com/express](http://www.lgphenom.com/express)

**Good Points** Great keyboard and screen. Fiendishly clever design.

**Bad Points** Won't fit in your pocket. Poor battery life compared with other PDAs.

**Conclusion** One of a new generation of machines, and at this price it is unbeatable.

# Computers

## ProLiant 800

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**COMPAQ**

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CI

Thanks to Compaq, Icon – one of the smartest chains of restaurants in town – has promoted its Masterchef to a Cyberchef. Discerning diners can visit the restaurants anytime on the Web. It takes just a couple of clicks to check out the day's specials, book a favourite table or order a sumptuous meal in advance.

Compaq's innovative technology lets Icon track a diner's preferences – so tailored menus can be e-mailed when business is a little slow. Soon, cameras set up in the kitchen will give customers a behind-the-scenes look at their meals being expertly prepared.

Compaq also helps Icon control stock. The Head Chef e-mails wholesalers with his order for the day's freshest produce. As inventory is automatically monitored, the restaurant is always well stocked.

Add to this a cleverly implemented Web marketing campaign and Icon diners can anticipate the finest cuisine à la Compaq.

# Serve your business unbeatable SO

Restaurant



The C-Series handheld PC companion is used throughout the chain for inventory checks. The data is then synchronised with the Deskpro and downloaded to the server. Purchasing can then be done centrally, saving huge amounts of money.

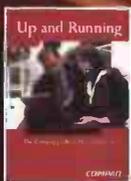


The Deskpro EP Series runs the point of sale system and handles all administrative tasks – from ordering stock to delivering accurate billing information. Menus and Web pages are created on the system.

Home



The Manager uses his Compaq Presario 1920 to keep a close eye on the business from home, while his children use it to surf the Net and help out with their homework.



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Menu of the day

ProLiant 800

The ProLiant Server runs the internal network, the menu and customer databases. Menus are cascaded to the restaurants via e-mail to the chefs. One of the server's most important roles is hosting Icon's Web site.

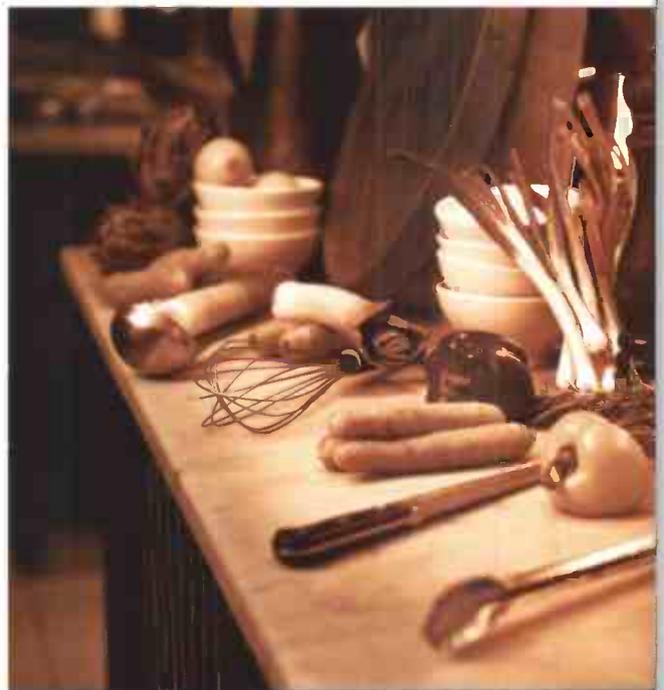
Kitchen

# olutions and unbeatable value



CarePacs provide extended warranty designed to offer convenience, complete peace of mind and minimise downtime.

The chain manager uses his Armada notebook while he is visiting restaurants or travelling abroad looking for new recipes or wines. With the autosensing AC adapter, he can use it anywhere in the world and his GSM card lets him keep in touch with everyone.



## The leasing route

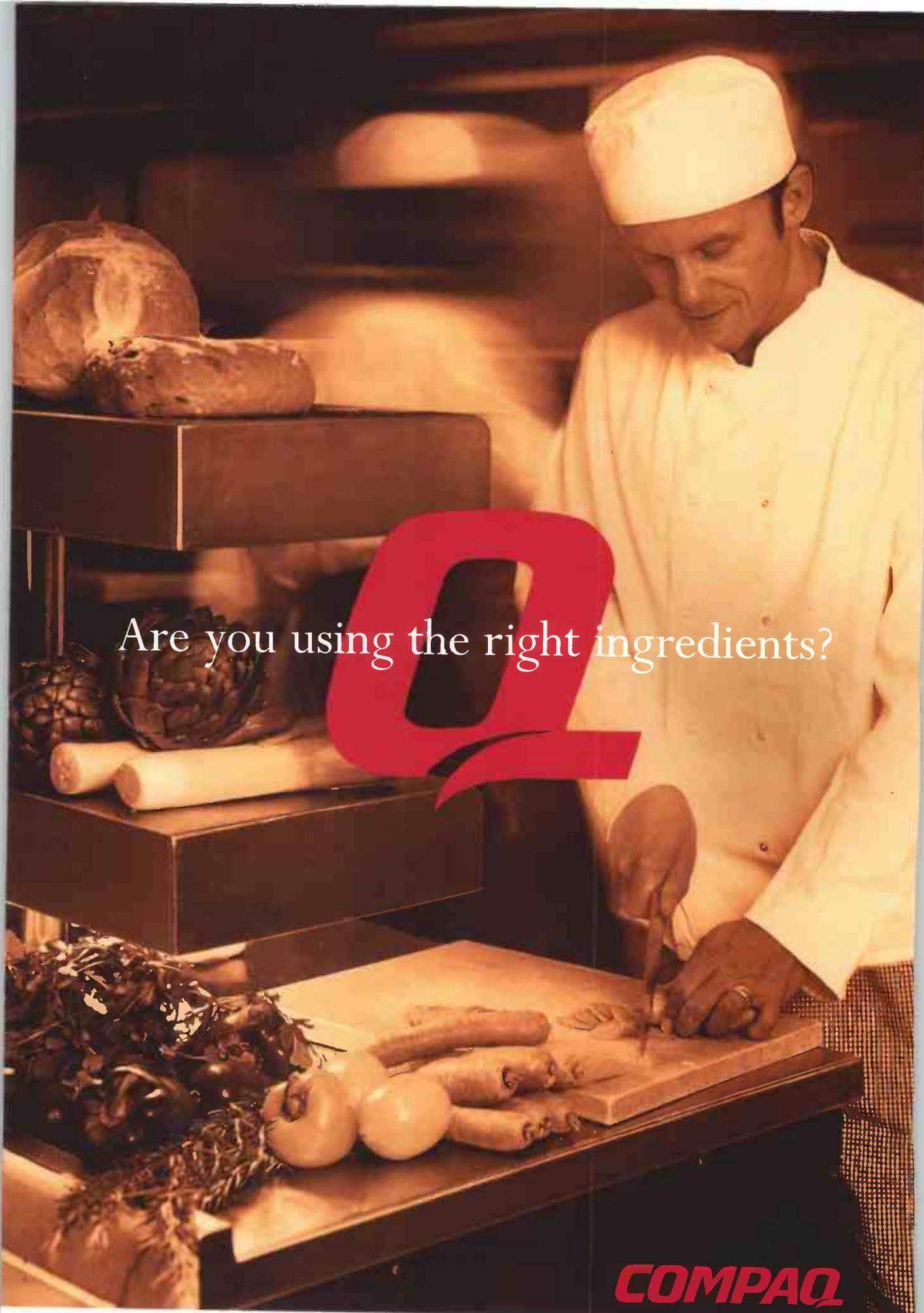
Just £65 per week! Icon chose to lease their entire solution – one ProLiant, one Armada, one Deskpro, two monitors, one Presario 1920, one C-Series, one 8-Port 10Base-T Hub, one modem card, one ISDN ISA Controller, four CarePacs – plus four days of consultancy from their chosen reseller.

This example is based upon a 48 month lease contract with rentals payable monthly in advance. Minimum value £5,000 and is available to limited companies only, finance subject to status. This example is only valid at the time of going to press and excludes VAT.



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CA



# tests of character



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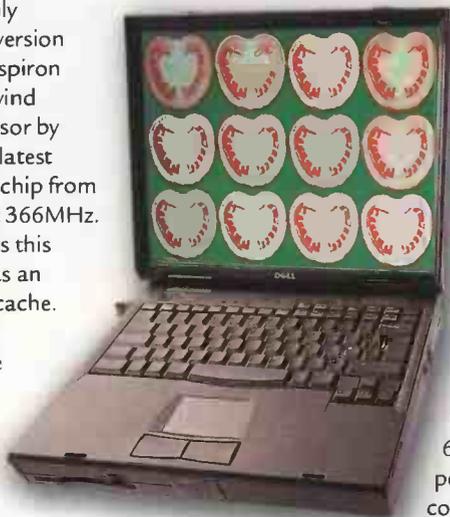
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For further information please contact  
Gordon Thorn 0171 316 9090

# Dell Inspiron 7000

An excellent notebook that benefits greatly from a **mobile Pentium II 366MHz chip**.

This internally enhanced version of Dell's Inspiron 7000 knocks the wind out of its predecessor by incorporating the latest mobile Pentium II chip from Intel clocking in at 366MHz. As an added bonus this faster CPU also has an enhanced Level 2 cache. Instead of 512Kb running at half the CPU clock speed, the 366MHz version incorporates 256Kb of Level 2 cache on its core which subsequently runs at the full clock frequency. The video sub-system sports a full 8Mb of memory running on an AGP2X bus. The full 3D support is impressive when viewed on the 15in TFT



and the increased memory means great graphics handling. Storage has been increased to 8.1Gb with upgrades planned up to 14Gb.

With all these enhancements, it was quite a surprise to see that the system memory had been halved to 64Mb. The superb performance results could have been even more so otherwise.

A power mode indicator would be helpful too. A pin-sized LED flashing every two seconds on the front is just not enough evidence that the system is on.

IAN ROBSON

## PCW DETAILS



★★★★★

**Price** £2,737.75 (£2,330 ex VAT)  
**Contact** Dell Computer Corporation  
0870 152 4850 [www.dell.com](http://www.dell.com)

**Good Points** Powerful processor. Powerful video sub-system.

**Bad Points** Stunted system memory. Unsuitable power-saving state indicator.

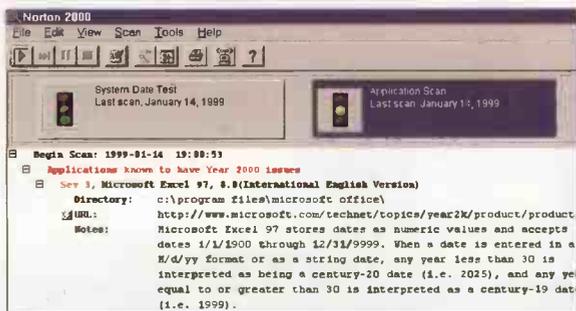
**Conclusion** The most powerful notebook currently available could shine just that little bit more with a fuller memory quota.

### PERFORMANCE RESULTS



# Norton 2000

Don't know if you're **ready for the millennium?** This package can put your mind at rest.



With the year 2000 looming large, time is running out to find out if your PC can handle the date change from 99 to 00 and, if not, to find a fix that makes sure it can by New Year's Eve.

Norton 2000 is rather disturbingly referred to as Version 1 and we wonder how many more we can expect before the Millennium is upon us. But it does come with a version of LiveUpdate which promises to keep the software abreast of current compliance issues via the web. It is the only Y2K software

we've seen that comes on a CD-ROM. It also uses a standard Windows interface, which is easy to use and makes a refreshing change from the usual DOS-based programs. It carries out three tests. The first checks your hardware to see if your BIOS, RTC (real time clock) and system clock are all compliant. Our PC passed the test, but there is a BIOS fix included if you aren't so lucky.

Unlike many solutions, it doesn't stop there. Norton 2000 also scans both your applications and data for potential problems, such as two-digit date calculations that use 99 as opposed to 1999, which could cause problems when the date switches from 99 to 00. It gives advice on how to solve any compliance issues, highlights your

Excel spreadsheets to indicate and explain date problems, and links up to manufacturers' web sites so you can access their advice too.

URSULA TOLAINI

## PCW DETAILS

★★★★★

**Price** £57.58 (£49 ex VAT)  
**Contact** Symantec 0171 616 5600  
[www.symantec.com](http://www.symantec.com)

**System Specification** 80486 processor; Windows 95/98/NT 3.51; 16Mb RAM; 10Mb free hard-disk space.

**Good Points** Scans software and data as well as hardware. Simple, intuitive interface. Comprehensive advice on problems, plus advice about solutions.

**Bad Points** Have to buy all-in-one test and fix even if your PC doesn't need a hardware fix.

**Conclusion** By far the best Year 2000 software we've seen, it's easy to use and checks both your hardware and software for compliance issues, giving useful advice on solutions where necessary.

# Dreamweaver 2

Web authoring software that gives Adobe a run for its money.



The user is first struck by the attractive interface of Macromedia's Dreamweaver 2. The stylish navigation 'launcher' that initiates the various palettes and inspectors is duplicated on the status bar at the bottom of the display, helping to reduce screen clutter.

Palettes are tabbed and dockable, like Adobe's award-winning interface. The

'property' inspector is context sensitive and is where most element alterations take place, as it tailors itself to contain attributes relevant to whichever part of the page make-up has been selected. Selecting files as links is as easy as dragging an elasticated icon next to the relevant attribute field (e.g. background image field) from the property inspector to the relevant field in the site window. Pages can be

constructed in either table or layer format, while the user may switch seamlessly between the two.

As layers are compatible only with browsers of version 4 and above, the site can then be transformed to tables to become version 3 compliant. A 'tracing image' can also be loaded onto the page as a layout guide so that the constituent parts can be laid out on top.

Generating tables is a breeze — entire columns can be cut and pasted from one part to another, a very useful and easy to use feature.

Those who like to keep a track of what is happening behind the scenes will welcome the inclusion of Allaire Homesite 4 for HTML code editing.

## PCW DETAILS



**Price** £299 (£194.89 ex VAT), upgrade for £99 inc VAT

**Contact** Computers Unlimited  
0181 358 5857 [www.macromedia.com](http://www.macromedia.com)

**System Specification** 90 MHz processor, Windows 95/98/NT4, 32Mb RAM, 20Mb hard-disk space, 800x600 256 colour display, CD-ROM drive.

**Good Points** Very easy to use, powerful, attractive.

**Bad Points** Expensive.

**Conclusion** Watch out Adobe — this is good!

# Epson Stylus Photo 750

Another quality Epson printer that scores on output and its software bundle.



This latest in Epson's Stylus Photo series is a colour inkjet that's well worth a look. It uses an improved version of Epson's well known MicroPiezo technology called Advanced MicroPiezo. This is a combination of two elements — Epson Ultra MicroDot and Variable-Size Droplet Technology, the aim of which is to produce the optimum combination of speed and print duality.

Six-colour printing is achieved by

using two cartridges. The mono cartridge is accompanied by another incorporating the standard cyan, magenta and yellow, and also light versions of cyan and magenta. The maximum resolution for both mono and colour is a phenomenal 1440x720 dpi, and the printer will accept media up to Letter size. Cartridge installation is simplicity itself, and the pre-release drivers

worked without problem.

We were impressed with the overall quality of the 750's efforts. It scored almost 97 out of a possible 108 marks in our standard tests, although speed was disappointing. We clocked it at a poor 1.4ppm of text at the fastest Normal (i.e. not Economy) setting. But most impressive was the positional test, where the 750 scored top marks.

A good software bundle includes

Adobe PhotoDeluxe, PictureWorks Spin Panorama and a few other useful resources. The 750 provides three methods of connection as standard. A parallel interface is present, as is USB (supported by Windows 98 and the Apple iMac). Unusually there is also a high-speed serial RS-423 socket for the connection of a Mac.

JAMES MARTIN

## PCW DETAILS



**Price** £272.60 (£232 ex VAT)

**Contact** Epson 0800 220546  
[www.epson.com](http://www.epson.com)

**Good Points** Generally good quality output, even on plain paper. Wide choice of connectivity. Nice software bundle.

**Bad Points** Mono and halftone images are too blue.

**Conclusion** A good printer that won't disappoint in terms of quality, but probably will in terms of speed.

# Catalog 3 eCommerce tool

To take advantage of the **growing internet trade** you'll need something like this.

**A**ctinic Catalog 3, a UK-produced electronic commerce package, aims to be inexpensive and easy to use but flexible enough to manage thousands of items.

Actinic Catalog 3 is a web store creator that runs on Windows 95, Windows 98 and Windows NT. It generates online stores by asking you to fill in the blanks before going on to create a series of HTML pages that constitute the store. Filling the store with your products is a case of entering them into the Catalog database. You can enter them one by one or create a database or Excel spreadsheet to be imported. Images have to be uploaded individually and their names entered into the product templates. When it's ready to go live you only have to hit the Update button to initiate the file transfer process. This sends the store up to the web server hosting it without involving you in any of the details of the FTP process.

**Catalog 3 is a major upgrade** with new shipping fee calculations and online payment processing options. Design templates for starter stores and more reporting options have also been added. Catalog 3 also brings up new 'sections' into which products can be grouped. In the previous version you had to hand-edit the HTML of the templates to create hierarchies. Now sections can be nested to create navigable hierarchies for

product types. To bring it into line with standards Actinic has added SSL support for the payment process, but Actinic's own encryption layer has been retained and enhanced, now using a 256-bit key.

Actinic stores must be hosted on servers that allow users to run Perl 5 CGI scripts. On average a catalogue occupies between 2Mb and 5Mb of web space depending mainly upon the number and size of graphics. The web site must have CGI processing capabilities. Currently this is Perl v5.003 or later.

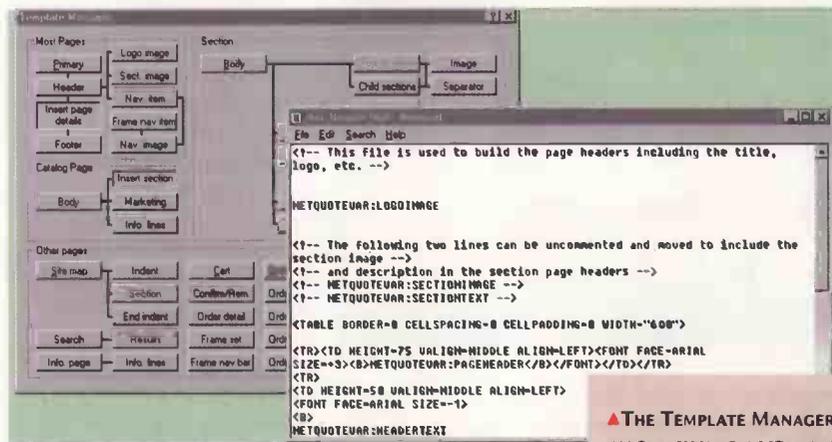
**Customers need to use** a Microsoft Internet Explorer or Netscape Navigator browser because Actinic Catalog 3 makes use of cookies and Java. Cookies keep track of the order process and a Java shopping basket encrypts the payment information end to end. For Actinic 3 the Java applet has been reduced to about 50Kb in size by only encrypting the sensitive credit card data, and this has speeded up the ordering process.

Actinic now supports online ordering by cheque, cash, and credit card. If you have a merchant agreement to take credit card payments which allows you to operate on the internet, you can collect card details via SSL or Actinic encryption and process the payments through your system. Alternatively you can purchase an optional online payment processing service

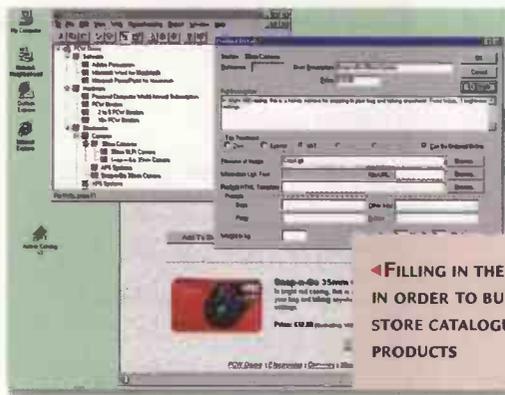
from an internet payment processing service. The payment is authorised and transferred electronically and you don't need to collect any credit card details. It costs a bit more, though. Setting up the payment option you have chosen is a matter of clicking some buttons again, but as with every aspect of Catalog 3 you can drill down into the dialogue boxes and fine tune the settings.

Generally, Actinic Catalog 3 makes creating a basic web store very easy and it has very good security for taking payment details online. The look and feel of the store and the reporting options could be more refined, but for now you can do that by editing the HTML templates.

TERENCE GREEN



▲ THE TEMPLATE MANAGER ALLOWS YOU TO ACCESS AND EDIT ALL OF THE HTML TEMPLATES IN YOUR STORE



◀ FILLING IN THE BLANKS IN ORDER TO BUILD UP THE STORE CATALOGUE OF PRODUCTS

## PCW DETAILS



**Price** £410.08 (£349 ex VAT)

**Contact** Actinec Software 01932 860524  
[www.actinec.co.uk](http://www.actinec.co.uk)

**System Specification** Windows 95 or Windows NT, at least 16Mb of memory, a modem connection to the internet, 2Mb - 5Mb web space with CGI processing and Perl 5.

**Good Points** Easy to use. Inexpensive. Full control of store. Good order processing system.

**Bad Points** HTML knowledge required to customise the store look beyond the basic selection of templates. Manual reporting system based on file export/import.

**Conclusion** An inexpensive but full-featured introduction to online sales with good support for tax, shipping, and online payment calculation.

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**coming from**



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# Sony CRX-100E

Quad-speed CDR recording is just one of the highlights of Sony's first CD-RW.

This is Sony's first foray into the CD-RW drive arena. It will write to CDRs at quad-speed (around 600Kb/sec) and to CD-RWs at dual-speed (300Kb/sec). Read speed for CD-ROMs is

a healthy 24-speed maximum. It comes complete with a CDR and CD-RW disk, plus a labelling pen.

The CRX-100E has a couple of features to distinguish it from the crowd. It has a large 1Mb data buffer to smooth out writing glitches, and the ability to record audio CDs with CD Text. This allows standalone CD players that support it — notably Sony players — to display album and track names.



Most importantly, the drive supports packet writing. This allows a CD-RW to appear just like a local hard-disk drive to the system, albeit a very slow one. The disadvantage is that formatting a CD-RW to the packet writing format wastes

a lot of space, reducing capacity from 650Mb to 530Mb. You also need special drivers

to be able to view the disks on a different system. The PacketCD software neatly solves this problem by incorporating a standard session on each disk containing a small reader program.

Apart from PacketCD, the drive comes with WinOnCD v3.5 as well as VOB Instant Audio specifically for

playing and recording audio CDs. WinOnCD is harder to use than Adaptec's rival Easy CD Creator, with too many technical questions and dialogue boxes being thrown up while trying to compile disks.

It's hard for manufacturers to really differentiate products like this, but the Sony drive is a comprehensive package that performs well.

DAVID FEARON

## PCW DETAILS

★★★★

Price £269 (£229 ex VAT)

Contact Sony 01932 816660

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

**Good Points** Quad-speed CDR recording, packet writing and CD Text facilities.

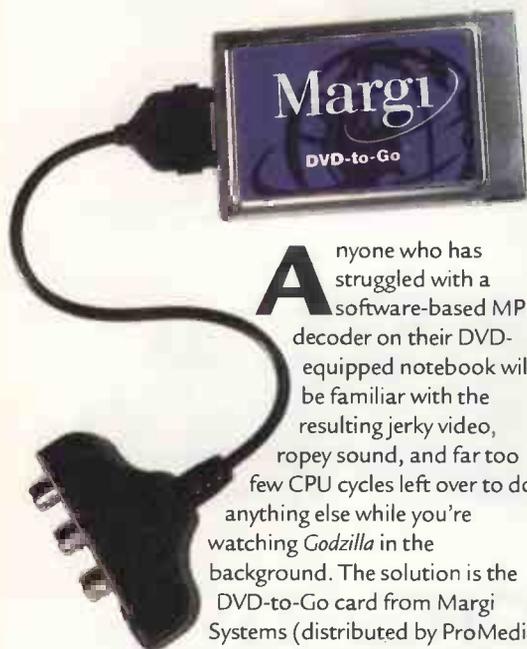
**Bad Points** Packet writing reduces CD-RW capacity. WinOnCD software is too complex.

**Conclusion** A good bundle at a reasonable price.

# Margi DVD-to-Go card



A PC Card that gives broadcast-quality video to the DVD user on the move.



Anyone who has struggled with a software-based MPEG decoder on their DVD-equipped notebook will be familiar with the resulting jerky video, ropery sound, and far too few CPU cycles left over to do anything else while you're watching *Godzilla* in the background. The solution is the DVD-to-Go card from Margi Systems (distributed by ProMedia in the UK), a Type II Zoomed Video PC Card that is designed to deliver broadcast-quality video with Dolby Digital sound for the mobile user.

The beauty of having a hardware-based solution like this is the ability to multi-task, allowing normal applications to run alongside your DVD movie if required.

**Plug and play installation** and an easy-to-use on-screen DVD control panel soon sees you watching high-quality video in full-colour at full screen and with full motion (30 frames per second). Dolby Digital (AC-3) Surround Sound with 5.1 channels is fully synchronised with the video for seamless viewing. Most of the usual DVD controls are there, including sharp slow motion and freeze frame video, multiple camera angles, up to eight language tracks and 32 subtitle languages.

You can watch video and listen to (stereo) sound using just your laptop screen and speakers (for movies on the move), or connect it to an external TV and/or amplifier for quality that rivals dedicated DVD players. A dongle is included that provides connectors for

stereo sound, composite video and S-VHS video. An optional connector is available that provides all that, plus an optical output for connection to a Dolby Digital amp.

BOB WALDER

## PCW DETAILS

★★★★★

Price £269.08 (£229 ex VAT); Luxury Dongle (with optical output) £55 ex VAT

Contact ProMedia Europe

01923 266400 [www.margi.com](http://www.margi.com)

**Good Points** Watch DVD movies at full speed while running other tasks on your PC. Dolby Digital 5.1 (AC-3) output.

**Bad Points** No means to select screen aspect ratio — annoying when using PC screen. Would be nice to see optical output included on standard dongle.

**Conclusion** If you have a DVD drive on your laptop, you simply HAVE to get yourself one of these — you'll never need to bother with hotel movies when travelling again. No DVD is complete without it!

# Dual Mirage 2000

## Ground-breaking notebook

It's neither small nor light, but **if it's quality you're after**, you've come to the right page.

**A**s the notebook market becomes accessible to manufacturers of every size, new breeds inevitably sprout wings and rise above the competition, often raising the stakes as they go. The latest contender, a ground-breaking notebook from Dual Technology, is the Mirage 2000. At first sight the 2000's vast case might make one think Dual had economised and avoided the compact form factor of many of its contemporaries. Closer inspection, however, reveals that the beast within just couldn't be constrained to a smaller chassis.

Built around a mobile Pentium II clocking in at a stonking 300MHz and boasting a grand 128Mb of system memory, no compromises have been allowed. Other notebooks may have started down this high-end path but few have followed through with similarly powerful supporting components. Indeed, as the specifications are reviewed, it becomes evident that from inception to completion the designers had a clear idea of what a desktop replacement was all about. One example is the cooling system. This includes a micro-fan sucking air from the innards, which more than caters for extended use. In almost six hours of testing, the temperature barely rose.

**As a desktop replacement**, this may be your sole workstation, and so the supplied 2.5in, 4.3Gb EIDE hard drive looks a little stingy. With careful design it might have been possible to squeeze in one of the larger 3.5in EIDE drives instead, taking advantage of the huge capacities currently available, although heat dissipation could prove difficult.

The display is a feast for the eyes: a full 15.1in of LCD with a native 1024x768 resolution affording a crisp and bright image right into the corners. Driven by NeoMagic's 4Mb video subsystem, you won't be seeing the most powerful graphics currently demanded by the very best games, but most requirements will be well catered for.

Dual has opted to include a DVD-



ROM drive in this model, which, in other notebooks, has been something of a wasted medium. Supported by Mediomatics' DVD software player you have a quality portable movie theatre. In our tests it dropped no frames. Ensoniq's sound system pumps through two remarkably full-sounding internal Rare Earth speakers and there's the option to add a low-resonance super-subwoofer or even wire this unit into a hi-fi. The audio accelerator also offers Dolby AC-3 digital decoding and, with the optional subwoofer, triangulated 'theatre style' surround-sound. In fact, with the Mirage 2000's TV-out interface there's really no need to fork out more dosh on a dedicated DVD player.

**Thinking of everything**, the next trump in Dual's pack is a built-in image-sensing camera and microphone. All necessary ports for printing, scanning and more are on-board and backed up by an infra-red port for high-speed data transfers. Two PC Card slots enable the use of all manner of removable

peripherals, including GSM-ready modem cards for mobile internet connectivity. Options to upgrade include memory support of up to 256Mb, an optional LS-120 to replace the internal floppy drive, and, once unlocked, your mobile hard disk can be slipped out in favour of a larger-capacity model. With its sturdy construction you'll be looking at a long-life machine, which, at these prices, is very reassuring.

**This review was written** in the traditional laptop manner — that is, on a train — and it has to be said that you may need shins of steel to support the Mirage's far from modest 3.5kg weight. This, though, is a small price to pay for the functionality of this extremely powerful system.

Forget the public's outraged stares as you transform your cosy British Rail alcove into a mobile office with the potential to videoconference with your colleagues in similar predicaments worldwide. Relish, instead, the wondrous technology at your fingertips.

IAN ROBSON

### PCW DETAILS



**Price** £2,541.53 (£2,163 ex VAT)

**Contact** Dual Technology 01223 576622  
[www.dual.com.tw](http://www.dual.com.tw)

**Good Points** LCD size equivalent to a 17in CRT, but without the radiation.

**Bad Points** Concern over storage space.

**Conclusion** Dual has pulled out all the stops.

#### PERFORMANCE RESULTS



# Roland XP-60 Music Workstation vs Terratec microWAVE PC Sound System

**T**wenty years ago, computers and synthesisers had so little in common that few could have predicted how closely integrated they have become in recent times. Today, you would be hard pushed to find a PC that doesn't come equipped with a powerful sound card and a range of audio and sequencing applications. By the same token, you would have a job on your hands to find a modern synthesiser that runs without sophisticated, custom software.

Although many attempts were made in the early eighties to connect computers up to the emerging range of MIDI-capable keyboards, it wasn't until the Atari ST came along in '85 that computers were first taken seriously for making music. But while the ST gathered pace, some of the biggest names in music technology, like Korg, Roland and Yamaha, were trying different ways to integrate computer-based recording on-board their synthesisers. This led to the development of the all-inclusive music workstation. But which system has the most to offer, and just as importantly, which is best for making music?

To find out, we got our hands on

▼ WHERE AUDIO IS MIXED AND ROUTED ON-BOARD THE EWS

Roland's XP-60 Music Workstation and compared it to



Terratec's EWS64 XL sound card and the new microWAVE PC synth module. To complete the computer-based set-up, Terratec also supplied us with a MIDI Master Pro controller keyboard.

The Roland XP-60 is a full-size, five-octave synthesiser that combines 64 voices of polyphony with three studio-quality effects and comprehensive, 16-track MIDI sequencing. Straight out of the box it comes with 8Mb of high-quality WaveTable samples, although this is expandable to 40Mb using up to four SR-JV80 plug-in cards. At present there are 14 cards in the series encompassing just about every type of sound going, from vintage synths and pianos through to orchestral and ethnic instruments. This approach isn't as flexible as sampling-in your own sounds, as you can with the Terratec system, but the flip-side is that you have a plethora of instruments that can be used instantly each time you power-up the keyboard.

The Terratec system comes with two synths, although the most interesting is undoubtedly the excellent microWAVE PC module. Based on Waldorf's microWAVE XT, a professional rack-mounted synth priced at £1,099, it provides 10 polyphonic voices across eight multi-timbral parts. Up to four effects can be used simultaneously in performance (or multi-timbral) mode and it features extensive MIDI implementation to enable real-time control of every synth parameter.

The second synth, which doubles up as a sampler, can be found on the main sound card. This provides 64 voices of polyphony and comes equipped with 6Mb of RAM expandable to 64Mb with standard 72-pin SIMMs. General MIDI sound banks are included on the accompanying CD in various sizes up to 4Mb, and the card's effects are available for all audio sources. These include the usual complement of reverb and chorus settings, although they're not a patch on what the XP-60 has to offer.



## Setting up

The Roland XP-60 is a true plug-and-play device: excluding plugging in the power cable and a couple of audio leads, it doesn't require any setting up. If you have a sustain pedal, this can be connected round the back, but we'll take a more detailed look at this in a moment. The Terratec bundle, on the other hand, isn't quite so straightforward.

## USER INTERFACE

**B**oth systems have their pros and cons when it comes to usability. The PC-based setup provides a graphical, on-screen environment for MIDI sequencing. What can beat that? However, when it comes to selecting and editing instruments, the same graphical environment can only be used to replicate the many buttons, sliders and dials that you find on the Roland XP-60. Although virtual consoles do provide a way in to the world of sound editing (see screenshot, right) they're a poor substitute for the real thing.

In contrast, the XP-60's range of controls and its 320x80 dot LCD display are no match for a monitor and mouse-driven sequencer. For example, to delete a single note from a track you must first call up the relevant screen and scroll through a list of events until you find exactly what you're looking for. With a PC-based sequencer, you have a far more meaningful and



visual overview of a track's contents that enables notes to be deleted just by clicking on them. It's not that you can't get the job done with a workstation, it just takes longer.

▲ THE MICROWAVE VIRTUAL CONSOLE. ALL THE IMPORTANT SYNTH PARAMETERS HAVE DEDICATED DIALS FOR REAL-TIME EDITING

The microWAVE needs to be installed in your PC and hooked up to the EWS sound card with two ribbon cables; one is for audio, the other carries data. And then there's the worry of conflicting IRQs and I/O ranges. Despite being one of the older ISA-type cards, the EWS64 was successfully detected and installed as a plug-and-play device.

Once the hardware is configured, the setup program continues to install the card's applications and utilities. The Control Panel (see screenshot, left) is the hub of the EWS software bundle. From here you can launch the main programs and configure how audio is routed from the card's various inputs with numerous switches. This isn't quite so straightforward as it could be, though, and takes a while to master.

### Ins and outs

The XP-60 is equipped with two stereo outputs: one for the main mix, and a second, direct-out that bypasses the internal effects. When working in performance mode, this enables selected instruments to be treated with external processors. Additionally, there's a dedicated output from the sequencer's click track, or metronome. This is handy if you need to play along with other musicians in certain live and recording situations.

We've mentioned the connector for the sustain pedal, and next to this are four more sockets for extra control pedals. These can be configured for pretty much anything you please, such as volume and expression, or even as start/stop switches for the sequencer. The remaining connectors are for

headphones, and MIDI in, out and thru.

Terratec's system offers a range of ins and outs to suit most audio and MIDI applications. The front-panel module has two sets of MIDI ins and outs, coaxial and optical digital inputs, two S/PDIF outs and a headphone connector. Round the back of the sound card itself are two stereo outputs, two line inputs, a mic input and the obligatory joystick/MIDI adapter.

### Keyboards

The MIDI Master Pro covers a four-octave range and provides pitch bend, modulation and data entry controls. Its green backlit display enables you to configure the data slider to send any CC (continuous controller); handy preset buttons are provided for volume, pan, reverb and chorus.

The keys are velocity sensitive and should be adequate for most users who will probably just want to bash a few chords into their PC. When compared to Roland's five-octave, semi-weighted keyboard, though, it doesn't have quite the same luxurious touch or action. When it comes to quality, the XP-60 wins hands down.

### Sounds

When choosing a synthesiser, it would be fair to say that the sounds are the most important thing you look (and listen) out for. As with any synth, the XP-60

## FEATURES AT A GLANCE

	Roland XP-60	Terratec Native Synth	microWAVE Synth
Polyphony	64 voices	64 voices	10 voices
Simultaneous parts	16	16	8
Number of instruments	512, 8 drum kits	128, 1 drum kit	256
WaveTable memory	8Mb ROM	6Mb RAM	<1Mb
Max. WaveTable memory	40Mb ROM	32Mb RAM	N/A
Number of effects	42	2	10
Max. simultaneous effects	3	2	1

*This table compares the main features of each synthesiser.*



▲ THE TERRATEC MICROWAVE PC SOUND SYSTEM: ALL YOU COULD EVER WANT TO MAKE MUSIC WITH

lives by its sounds and there's a great selection to choose from. In addition to the essential meat-and-two-veg General MIDI patches, it's equipped with plenty of dance and contemporary instruments. With a comprehensive range of editing parameters and access to new sounds on the internet, not to mention all those expansion cards, you'll be spoilt for choice. The pianos are expressive, the strings are warm-sounding, and the basses have plenty of depth and punch.

With names like Imperial Code, Blade Runner and, would you believe, HP LaserJet, the microWAVE clearly doesn't try to emulate real-life instruments. And as such, it doesn't need dozens of megabytes of wave ROM. Instead, the source samples tend to be short, pure, synthesised tones that take on a whole new twist once they have been treated with a raft of sound-shaping gadgets. These include banks of filters, envelopes, arpeggiators and effects. All of these can be controlled in real-time using the microEdit software (see box, p109).

The sounds, which range from squelchy analogue basses through to lush stereo pads, have a raw, grungy quality to them, which won't be everyone's cup of tea. But if you're looking for something a bit different from the norm, you'll fall in love with this box. I did. The General MIDI banks for the EWS card don't come close to the XP-60's rich, warm-sounding presets, but you do have the option to create your own sounds using the supplied Ed!Son software which turns the EWS into a full-featured sampler.

#### Sequencer

At the heart of any MIDI setup is the sequencer. Roland's 16-track recorder is surprisingly easy to learn and we had a song up and running within about half an hour. Editing and arranging proves to be a tad trickier than it does with Cubasis AV, which comes with the Terratec bundle, but there's not much you can't do.

The internal memory is good for 60,000 notes, and songs can be saved to disc with all performance settings tagged on. Cubasis offers unlimited tracks for MIDI and two for audio. Its graphical interface is much easier to grasp and quicker to work with, but then, you're unlikely to risk taking your PC out on the road. Each setup has its pros and cons.

#### Conclusion

Although both systems can record, edit and play back music, each will appeal to very different users. There are many joys to owning a music workstation, but not having to sit through operating-system start-up screens has to be near the top of the list. Neither do you have to download firmware, upload sounds or worry about general protection faults and compatibility with games. On the other hand, workstations are not as flexible as the PC-based equivalent.

The Terratec bundle has everything you need to create music with MIDI and audio. And while the keyboard may not be as luxurious, the sounds that come from the speakers are more than a match for the XP-60.

STEVEN HELSTRIP

## PCW DETAILS

★★★★★

### Roland XP-60 Workstation

Price £1,299 (£1,105 ex VAT)

Contact Roland UK 01792 515020

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

**Good Points** Works each time you turn it on. Excellent range of high-quality instruments. Expandable. Lovely keyboard. Single-button access to all the main features.

**Bad Points** Can store only one song in memory. No sampling capabilities.

**Conclusion** If you like the idea of a music workstation, the XP-60 won't disappoint provided you only need to work with MIDI. The instruments are suited to a wide range of musical styles and those expansion cards will see you right for a good few years to come.

★★★★★

### Terratec microWAVE PC

Price microWAVE module and EWS64 L, £749 (£637 ex VAT); TAMP1 MIDI keyboard, £129 (£110 ex VAT)

Contact Terratec 01600 772111

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

**Good Points** Extremely versatile setup. Superb range of preset sounds. Sampling and hard-disk recording. Comprehensive set of ins and outs. Great software bundle.

**Bad Points** The microWAVE only works with the EWS64 L. Cannot use S/PDIF input and microWAVE simultaneously. Poor set of effects. All those features can be tricky to master.

**Conclusion** This setup has more features than we've had pub lunches, and that's saying something. If you're happy to work with virtual panels (which seems to be the way things are going), there's everything here you could ever want to make music. Well, until the next best thing comes along, anyway.

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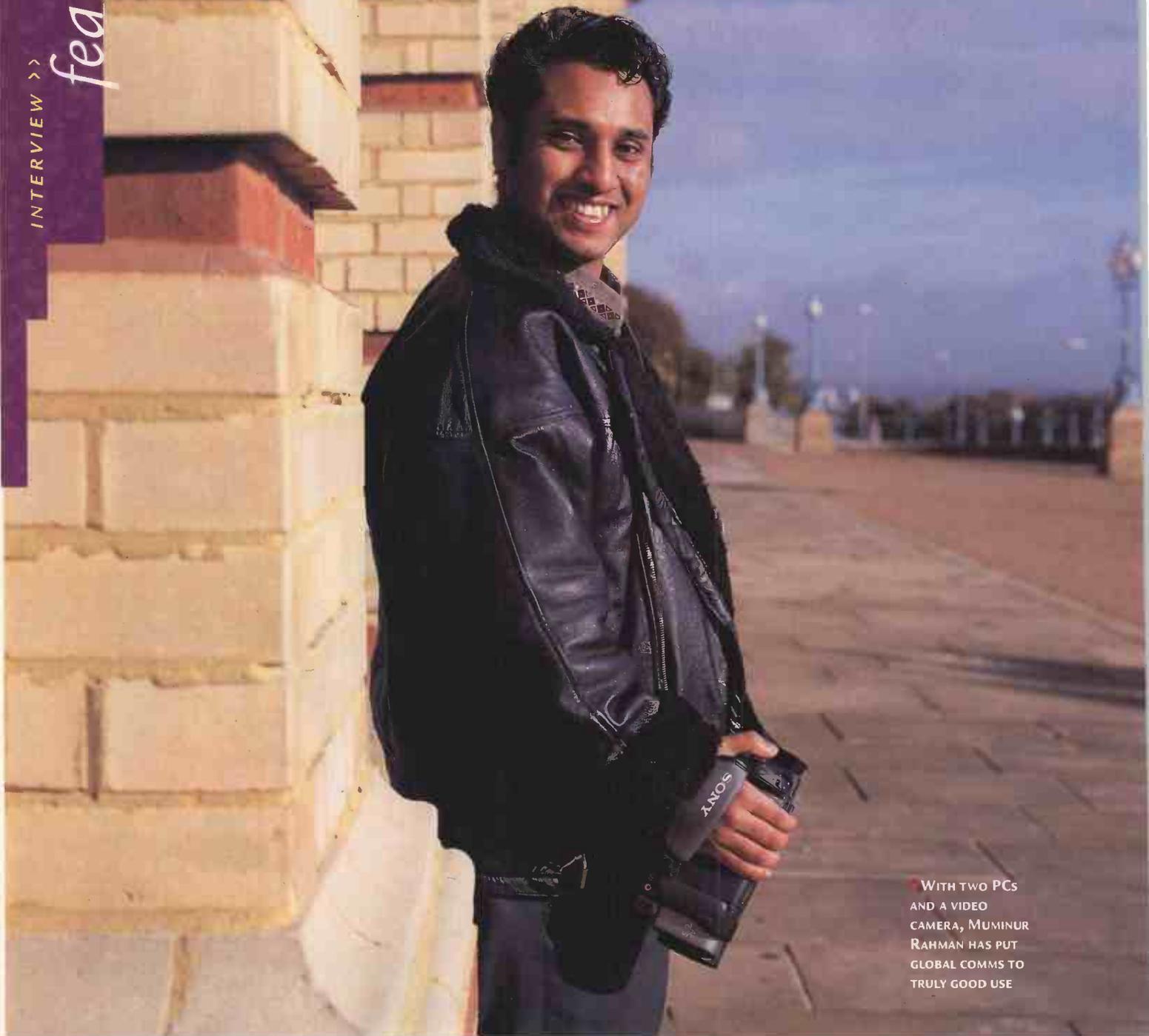
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Muminur Rahman

INTERVIEW >>  
feature



WITH TWO PCs  
AND A VIDEO  
CAMERA, MUMINUR  
RAHMAN HAS PUT  
GLOBAL COMMS TO  
TRULY GOOD USE

# Family man

Twenty-four-year-old Muminur Rahman has set up a videocall system whereby Bangladeshis in London can **meet and greet family members half way around the world** in their native country. Here, he tells Christopher Rye about his idea that turned a lifestyle novelty into a lifesaver.

Nick Dawe

**A** lot of hot air is talked about the 'global village', but Muminur Rahman is one man with a very real perspective on it. While you're leafing through the pages of *PCW*, marvelling at the glossy world of opportunities at your fingertips, it's worth bearing in mind that 3.1 billion people earn less than one pound a day. And the fact that many of these people, throughout the world, earn that pound churning out goods for your friendly, high-street multinational, might make you bag your beans with less of a smile.

So why, then, should 'developing economies', as we label them in the West, be interested in those gadgets that populate our desks and the pages of certain magazines? What would they want with PCs? Muminur Rahman, a talkative 24-year-old graduate, has one of the answers — and there are many of them. You might not have heard of him, but you might be hearing a lot more of him soon, a man who had his big idea while hunched over his Psychology and Management finals paper. Clearly, he was doing the right degree, as his idea, like many 'Eureka!' moments, contained more than a dash of psychology and a generous helping of sound business sense.

'I was born in Bangladesh and came to Britain in 1983,' he explains. 'There are 100,000 Bangladeshis in London alone, and large communities in Manchester, Birmingham and Newcastle too.'

'Of course, a lot of us still have families in Bangladesh. And chances are we don't see each other for years at a time. Say you had a nephew who was five when you left. Next time you see him he might be a married man with a young family of his own. It's a real problem for many of us.'

Which is how a studio in one of the richest parts of the world, the City of London, became half of a two-way videoconference-cum-cinema link, with one of the poorest — the town of Sylhet, in Bangladesh.

After university, in 1995 Muminur was granted a year's industrial placement with Xerox at the company's headquarters in Marlow, Buckinghamshire, liaising with sites in the US. Part of his job as an intern was marketing videoconferencing systems.

'I was amazed at what they could do,' he says. 'I didn't give it much thought at the time, but later on I started thinking about the two days it takes to get to Bangladesh. Many people can't get enough time off work to make a trip to the other side of the world worthwhile. Two weeks goes very quickly when you're with family, so sometimes people stay for six or seven weeks and either lose their job or get into serious trouble. Or else they leave their job and try to find another when they get back.'

And so it is that, thanks to Muminur, Bangladeshi families in London aren't just able to chat with their (very distant) relatives in Sylhet, but can laugh or cry along with a life-sized video projection of them. In fact, as he found out, they are able to do just about everything families do when they get together, except touch.

'When it comes to business, it's best to keep it in the family,' smiles Muminur. 'My father backed me up and gave me the encouragement. He was my market research, if you like, and coming from the community, obviously he could see the possibilities.'

'My brother — he's the technical one — checked the whole thing to see if it was viable, and he came in as a partner. We got funding from the banks, worked on it for a year, then my company, Liton Communications, went live in August 1998. I put together a package that satisfied my needs.'

The package, like the idea, is simple. At each end of the link is a 450MHz PC with a video card, along with a tripod-mounted video camera and (the most original touch) a video projector, bringing some of the scope and magic of cinema to those inanimate, grey boxes we rely on so much. In a darkened room in London, the faces and voices of Sylhet come to life.

**S**o, what's the software behind the project? NetMeeting, perhaps? Very much the industry standard for today's global, business-to-business videoconferencing. 'No. I spent a lot of time researching, and using my contacts at Xerox. In the end, they provided me with bespoke software for the venture. It's a modified one-on-one system, so we can use a state-of-the-art video camera and get the whole family in the picture, rather than just doing a person-to-person headshot.'

Obviously, the link itself must be state of the art? ISDN-based, at least, or perhaps an Inmarsat (satellite-based) system? Muminur dismisses the suggestion.

'Not at all,' he says. 'My bottom line was I needed something that worked in Bangladesh with what was already there — a fluctuating, unreliable electricity supply and bad phone lines. Just as importantly, I needed something my customers could afford to pay for.'

'So, we have either a 36in (quarter-screen) projection on the wall, with the modem running at 14-15Kbps. Or, with the faster modem speed of 33.6Kbps, we get a full-screen projection, but the projected image is of much lower quality: just 30 frames a second.'

'It's up to the customer to choose whether they want the small, fluid image or the larger, jerkier one. The PC adjusts the modem to suit what the families want.'

Another technical problem was that the



cameras had to work in sometimes difficult lighting conditions. The result was two TV studios — each dark one side, light the other, so the customers would be illuminated, but the far end of each studio would be dark enough to allow the projections to be seen. Muminur has employed an operator at both ends, zooming or panning the camera as the family wishes.

With everything in place, the Rahman mini broadcasting empire was ready for its first foreign correspondents, some of whom didn't always bring news they wanted everyone to hear. 'Of course, we can offer a private service,' laughs Muminur, embarrassed. 'The operator leaves the room if it gets too intimate or personal.'

As a predominantly Moslem people, arranged marriages remain an important part of Bangladeshi life. Among many things, Muminur's video link provides a welcome opportunity for prospective brides and grooms to 'test each other out' (in Muminur's words) from

**Muminur's ambitions are taking shape. 'There are a lot of Bangladeshis in New York and the Middle East, SO WE COULD EASILY EXPAND ... I just want people to talk'**

opposite sides of the world. If all goes according to plan, the proud parents of bride and groom could later be catching their first glimpse of their grandchildren online. But while a birth would certainly be an event too intimate and sacred to put in front of the cameras, Muminur has had to cope with a video funeral, as the coffin was wheeled into the Sylhet studio while the relatives mourned in East London's Cannon Street.

Of course, the videoconference and videophone concepts have been around since the 1950s, but Muminur's innovative take on the idea is closest in spirit to those times' often fanciful vision of what the 21st century would look like. But what has prevented the idea from catching on more in our own century? The answer is a complex one. The first issue is bandwidth, as anyone who has tried to stream video over anything less than leading-edge equipment will agree. The telephone network — not just in Bangladesh, but here — was simply never designed to carry video data or such high volumes of traffic.

But all that is changing fast. Fibre-optic technology means the network can run, literally, at the speed of light, and ISDN, satellite and GSM networks ease the burden still further onto competing systems. Soon, the digital TV networks, whether satellite, cable or terrestrial, could finally bring far-flung relatives and friends back into your living room. Businesses worldwide are starting to adopt videoconferencing technology, as the network finally catches up with their corporate aspirations and offers an opportunity to slash escalating travel budgets.

Peter Cochrane, BT's head of research, believes that the Star Trek-style holodeck, a virtual environment, could soon be commonplace in our homes. One day, BT claims, we won't just be able to see and hear our loved ones over the network, but interact with them in an immersive, 3D, virtual environment.

However, what is certain today is that new satellite networks are circling the globe. Hundreds more communications satellites will be in orbit and dodging comets soon after the Millennium. What this means, in the short term, is that those 'developing economies' we talk about will develop fast, and could easily leapfrog the US and Europe by giving their people access to cheap, truly mobile communications from a standing start. Lifestyle accessories, in other words, become lifesavers.

And it's people like Muminur Rahman, with the imagination and business acumen to seize these opportunities, who have already identified the need and the application.

**S**o where now for Muminur's big idea? Liton Communications is establishing new premises near Brick

Lane. 'It's like a high-street premises, rather than a big City studio,' he explains. 'But the problem is, a lot of people seem to compare my service with the cheap, bucket-shop, international call businesses you find on some street corners.'

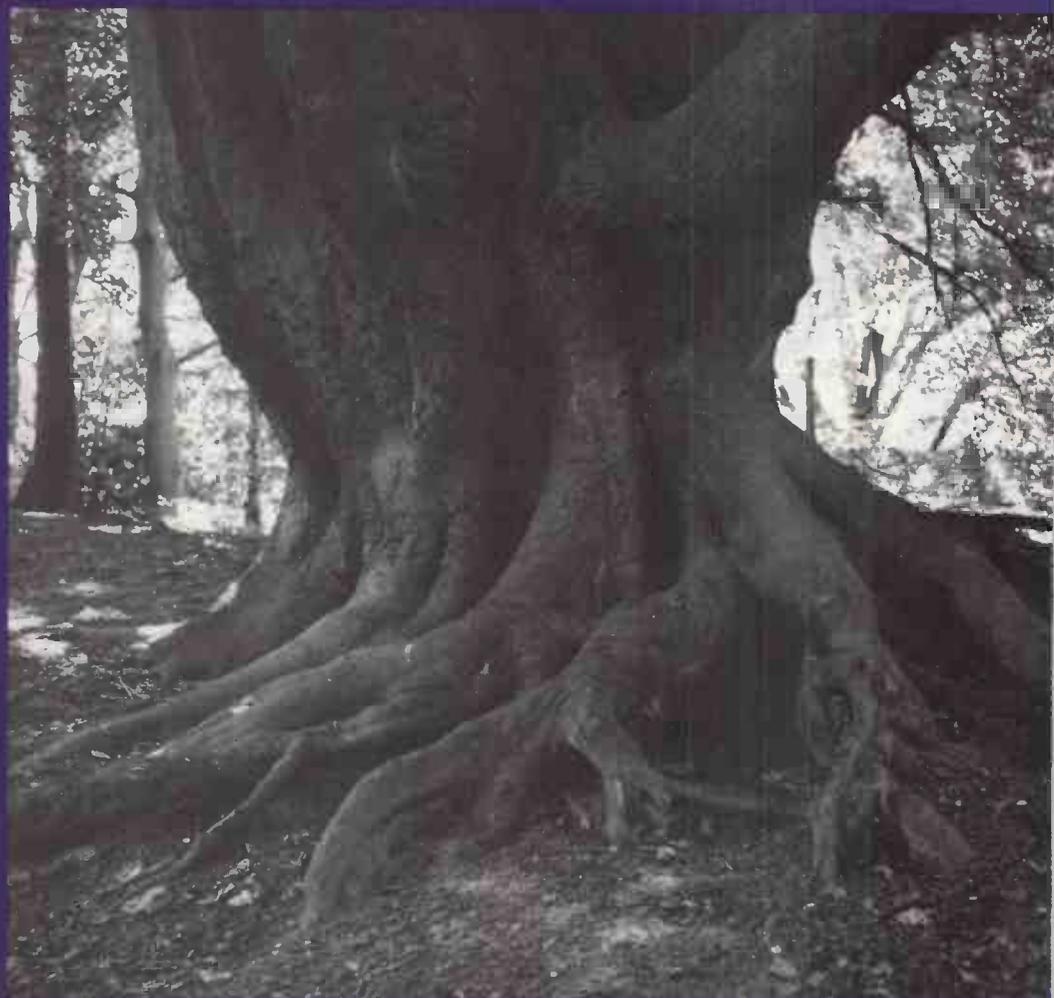
'We charge £1 a minute, with a £10 charge to hire the studio. It sounds expensive, but it's much cheaper than flying to Bangladesh!'

As for the long term, Muminur's ambitions are taking shape. 'There are a lot of Bangladeshis in New York and the Middle East, so we could easily expand. And I'm speaking to a Somalian in Canada, where there's a large Somalian community.' The global village is taking shape around us, and Muminur Rahman is laying some of the foundations. If affordable technology such as the internet really is as democratic and egalitarian as its proponents claim, then it is examples like his that have made it so.

As Muminur says: 'I just want people to talk.'

➔ Contact Muminur Rahman on 0181 886 0553

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# Course work

TO ACHIEVE AND RETAIN A COMPETITIVE COMMERCIAL EDGE, **SMALL BUSINESSES** NEED TO INVEST IN **IT TRAINING**. **ROBERT JACQUES** ADVISES ON THE BEST WAYS TO GET A TECHNOLOGY EDUCATION.



**Prime Minister Tony Blair** famously declared the three most important issues that need to be addressed in Britain today are education, education and education. If this is true for the country as a whole, then it is doubly so for a British small-business community that all too often ignores IT and IT training. There's a real danger of companies being left behind as computers are increasingly used to gain critical competitive advantage.

Ken Laidlaw

Among almost four million UK small and medium-sized companies, the Federation of Small Businesses (FSB) estimates that an astonishing 65 percent do not even own a PC. Stephen Alambritis, head of parliamentary affairs at FSB, says: "This is a crucial time for small businesses — a time of great danger and equally great opportunity. Technology is advancing at an incredible pace and the internet as a vehicle for trade is moving all the goalposts. Companies need to stop being frightened of IT and get up to speed

with the latest developments.'

There's a training mountain to be climbed for the SME community, but the benefits on reaching the summit will usually repay the effort. However, businesses that try to set off without the right equipment, or the skills to put it to use, risk being left out in the cold. Top of the list for the journey should be a clear understanding of what business-process improvements you aim to make. Only then can an effective IT strategy be formulated to address these aims. Once this is established, you need to identify what skills training is required to make the most of your chosen technology.

## Penny wise

At first glance the choices available in today's training market can appear bewildering, and you have to tread carefully to ensure you get the right package at the right price.

While the city and multinational corporates have money aplenty to throw at IT and IT training, the available resources for smaller companies can seem miserly in comparison and every penny must be made to count.

For SMEs, cost is often cited as a major barrier preventing training. Although training can seem prohibitively expensive for small concerns, it's important to remember that the benefits of the initial outlay will often be repaid many times over in terms of increased productivity. The good news is that some training is actually available for free. Although provision varies widely between regions, the Government can offer IT education programmes through its Training Enterprise Council (TEC) networks, supported by associated Information Society Initiative (ISI) and Business Links local support centres. These organisations can supply highly cost effective and often free or government subsidised courses for the SME and are currently being upgraded by the Government.

'I want to see an SME sector which is forward looking, internationally orientated, IT literate and innovative,' says Margaret Beckett, President of the Board of Trade. 'Business Links will provide a small army of personal fitness trainers for the SME sector.'

Local Business Links and ISI centres aim to act as a first port of call offering impartial advice to small businesses. John Swallow, spokesperson

## TOP TEN TRAINING TIPS FOR SMEs

- **Keep costs to a minimum** by first looking carefully at government-assisted training programmes. But don't lose sight of the fact that training is an investment that can and should be repaid through increased operational efficiency.
- **Don't go it alone.** Try to group together with other companies to reduce training costs.
- **Shop around.** Get quotes for comparable training from as many local companies as possible.
- **Check your potential training supplier carefully.** Ask to see a list of local satisfied customers that you can contact.
- **Make sure training companies** have the appropriate level of industry certification.
- **Use in-house training** to cut down on costs, but only if it will not disrupt the smooth running of your business.
- **Use out-of-house training** for larger, special projects that cannot be made to fit around normal working practices.
- **Web-based or multimedia training** can be a cost-effective way of training suitably motivated staff.
- **Never pay up-front.** By holding on to your money, you maximise your bargaining position in the event that the training was not up to scratch.
- **Don't put** the technological training cart before the business horse. Instead work out exactly how IT can help your business, and set your system and training goals accordingly.

for the Virtual Chamber at Manchester TEC, says: 'My advice to SMEs would be to go first to Business Links. It may make a small charge, but it doesn't have a commercial axe to grind and so will be able to offer impartial advice. It can find out what's available from local training

The choices available in today's training market can appear bewildering and **YOU HAVE TO TREAD CAREFULLY** to get the right package at the right price

companies, colleges of further education, TECs and ISIs.' It's also worth looking to see if you have a local charitable group that offers IT services and training. Hulme Community Computing, sponsored by Manchester City Council, is one such regional group that offers free advice and basic computer training. Mike Hubbard, company secretary at the project, explains: 'It's usually the companies that have no computer experience that are most scared. Through training we can help businesses overcome such fear and get started with IT in the first place. We advise going for mainstream programs from big-name companies like Microsoft and Lotus.'

## Commercial courses

These charitable groups don't usually aim to provide in-depth technical instruction, but tend to confine themselves to a practical working

Microsoft Certified  
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## SMEs need training to keep up after the ELECTRONIC COMMERCE BILL becomes law

To retain a competitive edge, successful companies of all sizes have always recognised the need to keep up with technology. The internet, though, is changing all the business rules.

The Electronic Commerce Bill, announced in the last Queen's speech, is currently making its way through parliament and should become law this summer. It aims to allow businesses to conduct secure financial transactions over the internet. The SME market faces a huge struggle in this emerging digital marketplace. The rewards are potentially massive, but only effective IT training will enable them to be realised.

'Electronic commerce is crucial to the future prosperity of our economy and the competitive position of our industries,' says Barbara Roche, former Minister for small firms and now

financial secretary at the Treasury. As the Government assembles the legal framework, forward-thinking businesses are scrambling to set up their virtual shop fronts in cyberspace.

**'The electronic internet marketplace is a massive opportunity for SMEs. The beauty is, while the shop is closed and the proprietor fast asleep, the system never stops taking orders, potentially from all over the world,'** claims Stephen Alambritis of the Federation of Small Businesses.

'Electronic trade can increase the customer base beyond recognition, while at the same time reducing costs.'

But this opportunity does not come without risks. In order for these highly complex technical projects to succeed, staff need to be given effective training to set up and manage the new systems.

overview of popular systems and desktop programs. While not detailing all of the technical intricacies, they'll at least get you started. If you need to delve into greater detail — for example, learning how to install and handle a new, complex infrastructure — then you may consider one of many commercial IT training providers.

These organisations offer an extensive variety of courses that can be tailored to your particular needs and typically lead to an industry-recognised certification such as the Microsoft

Certified Professional qualification, but they'll cost you more than the government sponsored initiatives. You pay your money and you take your choice. 'The advantage of going through the TECs is that you may be able to have part of the cost subsidised. The disadvantage is the paperwork and forms you have to deal with for the subsidy. On the other hand, you will certainly pay more for private training. But if you choose carefully and find the right provider in the private sector, it will usually be more flexible and up to date with the latest technology,' says Alambritis.

But Hubbard advises SMEs to check out all the low-cost options from TECs and local colleges before shelling out for private training. 'Further education colleges can offer much better value than companies charging £100 per day,' he says. 'Computers are just a business tool and it's often overkill to take hugely expensive and very detailed courses. But if you find your needs can only be met through private training, reducing costs becomes the number one priority.'

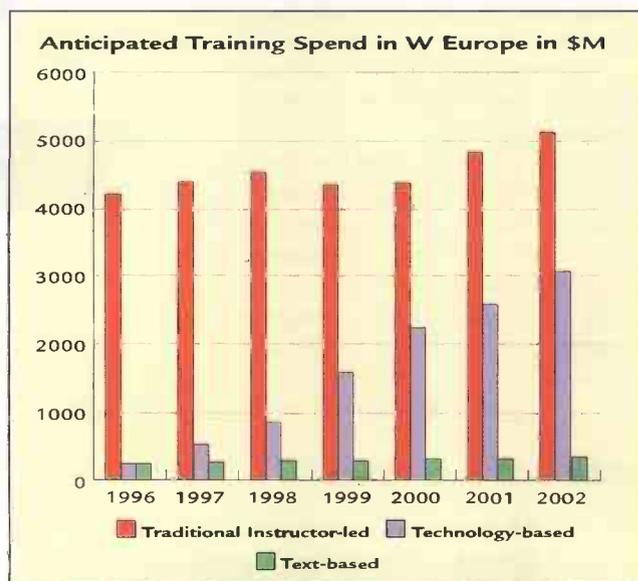
FSB advises trying to 'piggyback' on courses already being conducted for larger companies — ideally companies with which you already have a trading relationship. If this isn't feasible, the Forum suggests that a group of local businesses that share similar training needs club together to negotiate a discount through economies of scale.

Steve Gilroy, MD at Microsoft certified training provider Executrain Europe, acknowledges that some SME managers are put off by the perceived high cost of training. But he promises prices are falling even while courses are becoming more flexible. 'Trainers are increasingly targeting the SME market — it's a huge growth area,' he says. 'Costs are already coming down as a result of fierce competition, and businesses are increasingly opting for the flexible courses we offer that fit in with their working schedules. People want training during evenings and weekends so that's what we now offer.'

### Private practice

When dealing with the private sector it's important to realise that not all commercial training companies are created equal. The best

advice is to shop around, get as many



◀ **IDC SHOWS WEB-BASED TRAINING IS ENJOYING EXPLOSIVE POPULARITY, BUT IS IT RIGHT FOR YOUR SME?**

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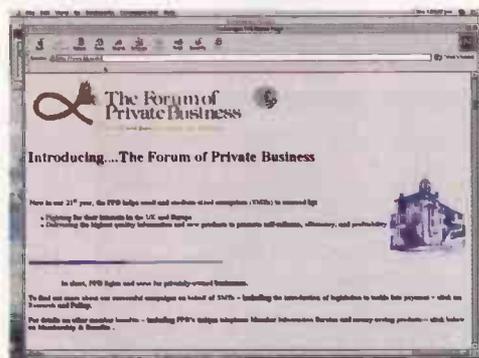
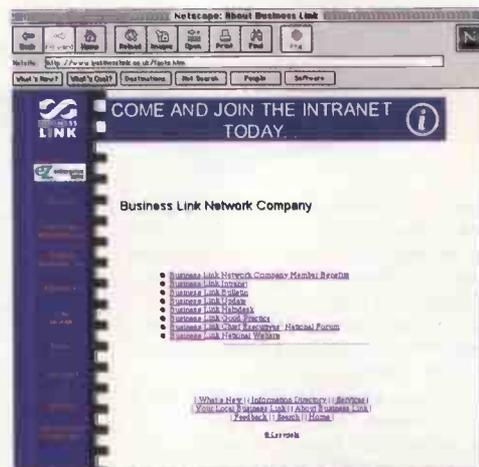
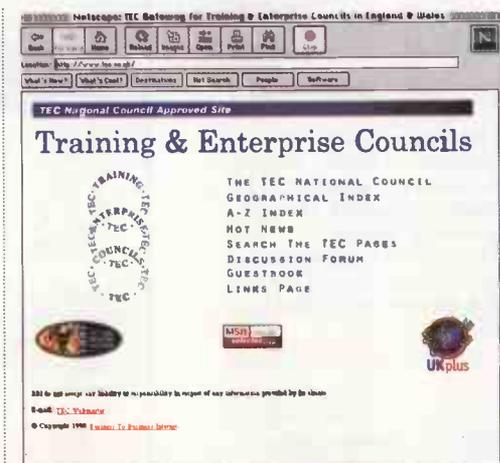
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Hands on technology





quotes as possible and make sure your potential provider is suitably qualified, preferably with the appropriate level of certification from the manufacturer of your software or system. You must also hang on to your money until the course is over so that you remain in the strongest bargaining position if the trainer fails to deliver on its promises. This is most effectively done by contacting recent customers from competing training providers to ensure they were happy with the service.

'There's no shortage of companies offering training courses. People need to think very carefully about where they go and make sure the provider is reputable, rather than just choosing the first name in the phone book,' warns Clare Curtis, Microsoft's certification development manager. Microsoft does not conduct training itself, but offers its courses through approved third parties. 'We have our Microsoft Certified Technical Education Centres where we strictly specify how the training programmes must be conducted. We set minimum standards covering aspects including qualification of

**▲ EACH OF THESE WEB SITES IS A GOOD STARTING POINT FOR SME'S LOOKING FOR LOCAL IT TRAINERS AND LOW-COST TRAINING**

trainers and specification of equipment and course material, so that customers are guaranteed a high-quality service for their money,' explains Curtis.

It's not just a question of choosing a training company, but of choosing a company that offers exactly the right course. Gilroy warns that some trainers are guilty of selling inappropriate courses because they don't adequately check their customers' requirements. 'Some companies sell training that's just not appropriate. If a business needs product overview training there's no value in taking a five week in-depth course,' he says.

## The right stuff

Having successfully chosen the right provider and the right course, all that remains is to work out the best way to deliver the training. For some companies in-house programmes can be effective, but can disrupt the everyday running of a small business. You could send your staff away on a course, which will be more expensive but doesn't interfere with the workplace. If staff are suitably enthusiastic, self-study courses can be cheap and effective.

'One of the fastest-moving areas in IT is web-based training. We're seeing a huge growth in this relatively inexpensive and flexible approach. Most independent research shows a high data retention rate,' says Sheila McGovern, research analyst at International Data Corporation (IDC).

There are clearly many options to consider, and for SMEs the IT training market may seem like a minefield. You must tread carefully and choose the right course, the right provider and the right method of delivering the training. And, if you keep your head and make the correct choices, your business can emerge stronger and fitter, armed with the right technology for the commercial battle in the next millennium. □

## PCW CONTACTS

*There are no universally applicable telephone numbers for the following, so URLs have been supplied. Respective local bodies can be reached through their local numbers, all of which are on the web pages of the sites listed.*

### Business Link

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

### Enterprise Zone

[www.enterprisezone.org.uk](http://www.enterprisezone.org.uk)

### Training and Enterprise Councils

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

### Microsoft Training and Certification

[www.microsoft.com/train\\_cert](http://www.microsoft.com/train_cert)

### Information Society Initiative

[www.isi.gov.uk/isi/lsclist.html](http://www.isi.gov.uk/isi/lsclist.html)

### Forum of Private Businesses (FPB)

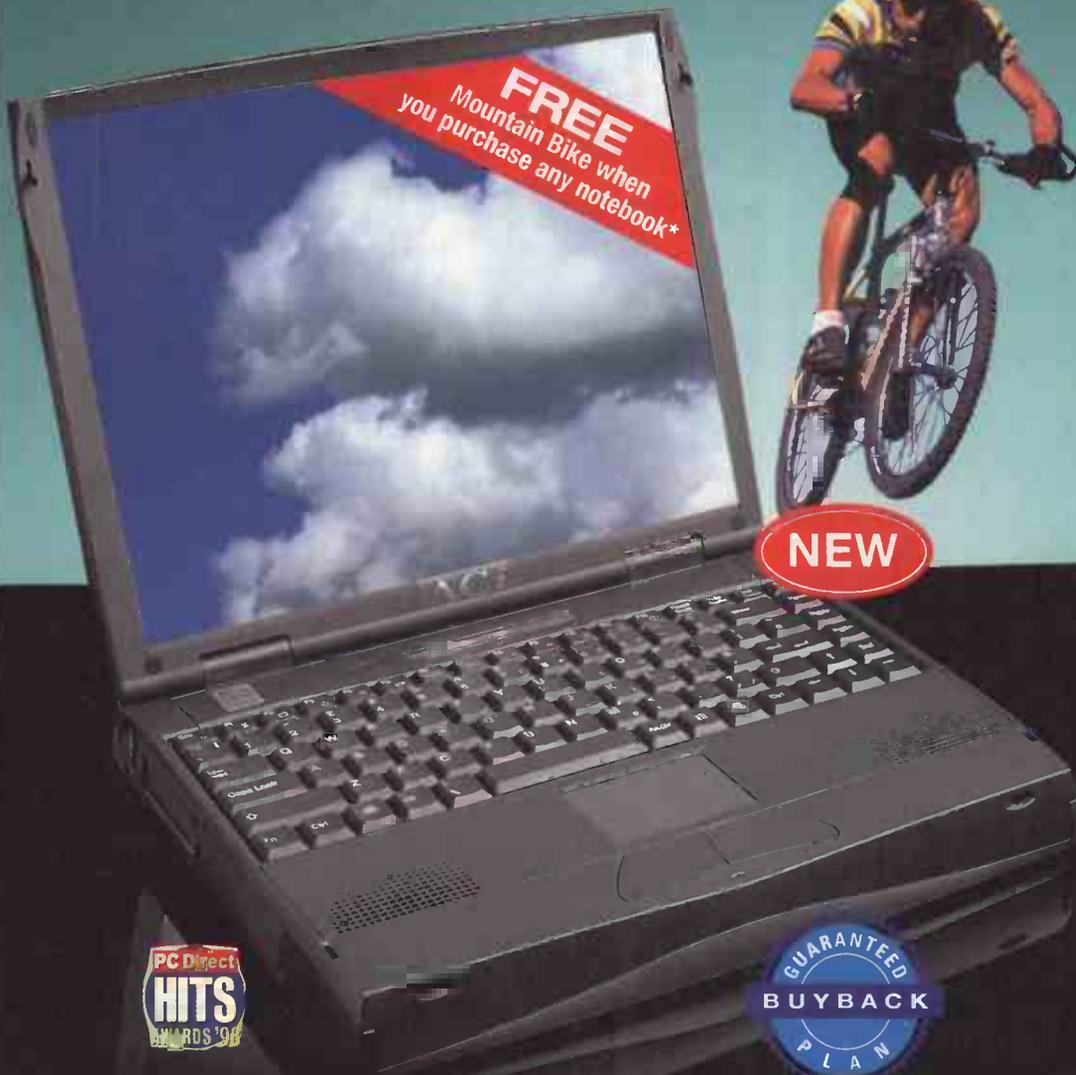
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# Pentium III

Intel launched the Pentium III (formerly 'Katmai') with much fanfare. It is positioned as the company's next high-end offering, knocking the 450MHz Pentium II off the top spot for desktop PCs. With the introduction of the Pentium III, Intel's product strategy is clear. Its budget Celerons compete in the same segment as processors from AMD and Cyrix, providing good performance at a low cost. The Pentium II will now become Intel's mid-range CPU and will continue to dominate the £1000-£1300 segment of the market.

Illustration by Miles Cole

The Pentium III will enter the low-volume premium arena. It will also find its way into the low-end workstation and server market, as some of the new features of the Pentium III make it more appealing to workstation and server manufacturers than the Pentium II. The Pentium III will debut in 450MHz and 500MHz clock speeds. It is currently manufactured using a 0.25 micron process. Later this year, Intel will introduce faster Pentium IIIs manufactured using a smaller 0.18 process.

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♦ Tested and reviewed by Ajith Ram

## Ratings

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

# EVERYTHING THERE IS TO KNOW ABOUT KNI

**T**he newly released Pentium III boasts some new features that differentiate it from its predecessor. It has 70 new instructions intended to provide a performance boost in a number of applications.

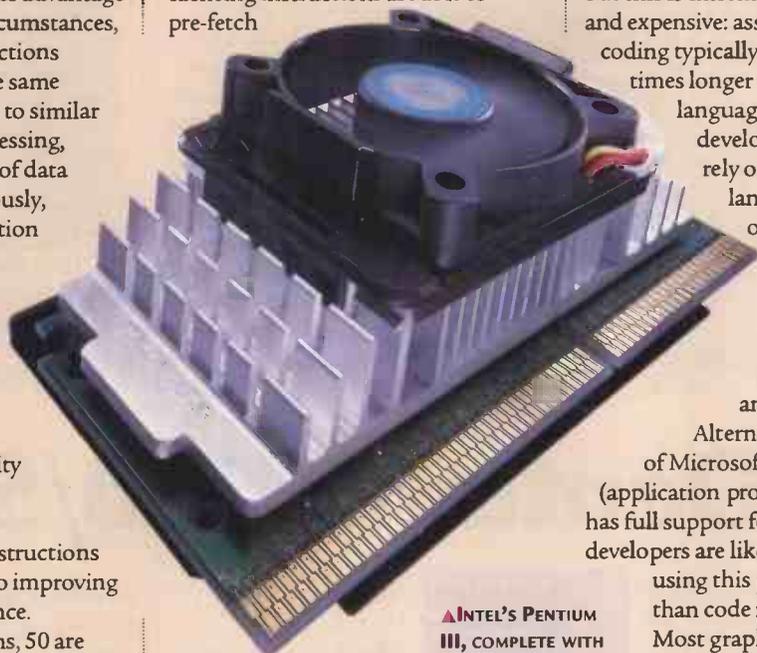
The Katmai New Instructions, or KNI, are similar to the MMX instructions in the PII. Both MMX and KNI operate on the same SIMD (Single Instruction, Multiple Data-stream) principle. For most of its working life, a CPU performs the same job many times over and SIMD takes advantage of this fact. In normal circumstances, the CPU processes instructions sequentially, applying the same instruction over and over to similar data types. In SIMD processing, identical or similar types of data are processed simultaneously, applying just one instruction to multiple sets of data. This parallel processing leads to a significant leap in performance. MMX applied SIMD processing to integer or whole numbers. Now, KNI brings the same ability to process more complex floating-point numbers. However, the new KNI instructions are not solely dedicated to improving floating-point performance. Of the 70 new instructions, 50 are dedicated to improving single-precision floating-point performance, while another 12 instructions enhance integer calculations. The last eight instructions enhance data cacheing.

**Floating point (FP)** performance is critical for some applications like games which depend on the CPU to perform most of the geometry calculations. With its new floating-point instructions, KNI can give overall performance a significant boost.

FP is also important for activities like real-time MPEG/MP3 encoding. Currently, MPEG encoding has to be done using task-specific hardware because the FP performance of previous CPUs has not been good enough. KNI has the potential to change that. A Pentium III running at 500MHz has a FP throughput of

2Gflops (two billion operations per second) and Intel claims this is sufficient to do real-time video and audio encoding and decoding.

**As we've said**, eight instructions help with cacheing data. Memory latency, or the delay in retrieving data from memory, is one of the greatest bottlenecks to CPU performance. The average CPU spends a lot of time waiting for the required data to arrive from system RAM. KNI's data cacheing instructions are able to pre-fetch



▲ INTEL'S PENTIUM III, COMPLETE WITH ITS ENORMOUS HEAT SINK

new data while the CPU is occupied, allowing a more regular flow of data between the system RAM and CPU cache. This could again boost performance, particularly when more than one CPU is used.

**The new KNI** instruction set has some welcome differences from its MMX counterpart. MMX uses the same registers as the integer unit of the CPU, which prevents both MMX and integer units being used simultaneously. Switching between the two results in a lot of lost clock cycles. KNI avoids this problem by using a new set of registers, so both KNI and the floating-point units can function in parallel. But using the new registers is not without its problems. To access them, the CPU has to enter a

new state of operation. The last time Intel introduced a new processor state was in the 386 CPU over six years ago.

**Unlike the normal** floating-point unit, the KNI instruction set does not function automatically, so applications have to be specifically written or modified to take advantage of KNI. There are two main ways to do this. The most efficient way to access the Katmai instructions is to code the application in pure assembly language, but this is extremely time consuming and expensive: assembly language coding typically takes two to three times longer than any advanced language. Therefore, most developers are likely to rely on tried and tested languages like C or C++, even though this sharply reduces the overall efficiency of the application and its performance.

Alternatively, version 6.1 of Microsoft's DirectX API (application programming interface) has full support for KNI. Most games developers are likely to access KNI using this popular API rather than code in assembly language. Most graphics cards already have optimised drivers for DirectX 6, so games using KNI should have little trouble running on these cards.

**A KNI patch** for Windows 98 is available from Intel. Windows 2000 will support the new instructions by default. There is no patch for Windows 95 users.

**The introduction of** Intel's KNI draws inevitable comparisons with AMD's older 3D Now! technology. KNI and 3D Now! have an identical maximum throughput of 2Gflops. Because 3D Now! arrived early last year, more applications currently support AMD's technology than KNI. But this is likely to change soon: developers cannot afford to ignore the world's largest CPU manufacturer.

# Carrera Maxima

The Carrera Maxima is built around a 500MHz Pentium III, cooled by a large heat sink and fan. It has 128Mb of RAM on a single DIMM slot, leaving two slots free for upgrading. The large 10Gb hard drive has been partitioned into two drives, which will help to save on disk space when large files are used. The Maxima uses a Rage 128 graphics card from ATI, one of the most powerful graphics cards available. It supports full 32-bit colour and MPEG-2



decoding, so the 5X Creative Labs DVD can be used without a separate hardware decoder. The Carrera system also has an LS-120 drive which is compatible with floppy disks. Like the Dan PC [below], audio is handled by the versatile SoundBlaster Live!, also from Creative Labs. Capable of handling up to 512 voices, it has high-fidelity and reduces CPU usage. A 56K modem occupies the PCI slot next to it. This leaves two PCI and three ISA slots free for upgrading. Initially, the Maxima had trouble booting up: we tracked down the problem to a loose DIMM module. Otherwise, the system posed no problems. Its interior is very spacious thanks to its excellent build quality. With a SYSMark score of 211 and a 3D Mark

rating of 1788, the Maxima is one of the fastest PCs we have seen.

**To top off an excellent system,** Carrera has included a 19in LG monitor. It supports a maximum resolution of 1600x1200 at 70Hz. Picture quality is excellent, and the controls are responsive and easy to access.

## PCW DETAILS

**Price** £2,055.08 (£1,749 ex VAT)

**Contact** Carrera 0171 830 0586  
[www.carrera.co.uk](http://www.carrera.co.uk)

**Good Points** Excellent build quality. High-performance, powerful graphics card. Large monitor.

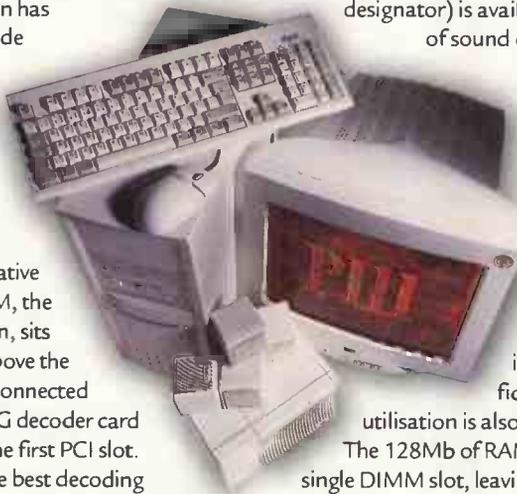
**Bad Points** Had trouble booting up first time.

**Conclusion** A power user's dream system.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★★

# Dan Dantum 3 500/S

The Dantum 3 sports a 450MHz version of the Pentium III. This new processor is backwards compatible with BX motherboards, so Dan has chosen an Asus P2B board with the BX chipset. It has two PCI and two ISA slots free, for easy upgradeability. As befitting a PC with a Pentium III, Dan has chosen to include a massive 14.1Gb hard drive. There is also an LS-120 drive which can read ordinary floppies. A Creative Labs DVD ROM, the latest 5X version, sits immediately above the LS-120 and is connected to a Dxr2 MPEG decoder card which sits on the first PCI slot. This ensures the best decoding performance, rather than relying on



the main CPU. There are even two DVD games included. The main graphics card is the 8Mb Millennium G200 from Matrox. An excellent choice for a high-performance system, it is capable of good 2D and 3D acceleration. Its drivers are fully DirectX 6 compliant and a beta OpenGL ICD (international code designator) is available. The choice of sound card reflects the high quality of the Dan system — Creative Labs' new SoundBlaster Live! is the most powerful on the market. In addition to its excellent fidelity, its CPU utilisation is also very low. The 128Mb of RAM occupies a single DIMM slot, leaving two free for upgrading. The system's build quality is

excellent. With the wires and IDE cables tucked away, components are well ventilated and easy to access.

**Oddly for such a high-end system,** Dan has included a modest 15in CTX monitor. It is capable of a maximum resolution of 1024x768 at 70Hz and its image quality is very good.

## PCW DETAILS

**Price** £2,162 (£1,840 ex VAT)

**Contact** Dan 0181 830 1100  
[www.dan.co.uk](http://www.dan.co.uk)

**Good Points** Excellent build quality. High-performance, good-quality components.

**Bad Points** Small monitor. Expensive.

**Conclusion** A good configuration worth considering.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★★

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## Software Bundle Two

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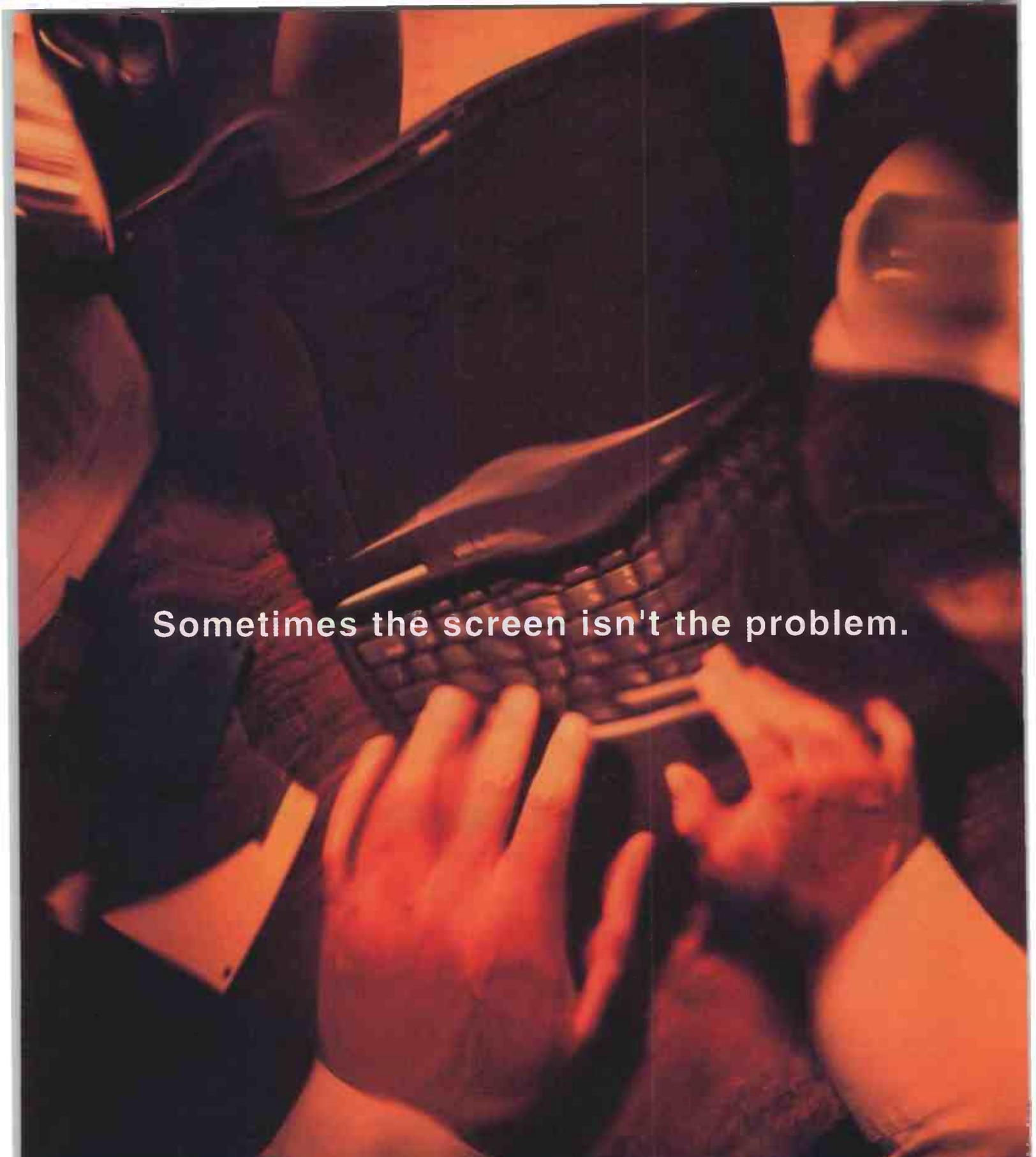
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# EveshamVale Platinum

Supporting a 500MHz Pentium III, the EveshamVale Platinum TNT Live! 500 has 128Mb of RAM in a single slot. This leaves three DIMM, two PCI and three ISA slots free for upgrading. The Evesham system covers all bases with both Iomega Zip and LS-120 drives, the latter providing backwards compatibility with floppy drives. The Platinum also has a large 9.1Gb hard drive. This PC achieved the highest 3D Mark result in this group, primarily due to the powerful 16Mb STB Velocity 4400 graphics card. Built around the Riva TNT



chipset, it supports 32-bit colour, DirectX and OpenGL. Audio is handled by Creative Labs' SoundBlaster Live! This card's DSP (digital signal processor) is as powerful as a Pentium 133; hence it is able to handle most of the processing without involving the CPU. Evesham has included a 2X DVD drive but there is no dedicated MPEG decoder and the user must make do with a software DVD player. Despite the powerful CPU, this method of DVD playback could result in lower-quality images. The ATX case is not as large as the Panrix and Carrera systems yet ventilation is more than adequate. This is particularly important since the STB graphics card runs very hot. The heat sink around the Pentium III is slightly different from that of the Pentium II. Despite the CPU's high clock speed, it does not run particularly hot.

**Evesham has included** the 19in Taxan Ergovision monitor with the Platinum. It supports a maximum resolution of 1280x1024 at 70Hz. Image quality is good, but not as sharp as the Iiyama Vision Master Pro 450. Its controls are easier to access, though.

## PCW DETAILS

**Price** £1,937.58 (£1,649 ex VAT)

**Contact** Evesham Micros  
0800 496 0800

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

**Good Points** Good components. Decent performance. Large monitor.

**Bad Points** No hardware DVD decoding.

**Conclusion** A system with an interesting configuration, but not exceptional.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

# Panrix Fusion SCSI 500



Panrix has a reputation for building quality PCs. The Fusion SCSI 500, based around a 500MHz Pentium III, does nothing to spoil that reputation. The CPU sits on an Asus P2B motherboard with a BX chipset and has four DIMM slots, one of which is occupied by the 128Mb RAM module. The graphics card is the Diamond Viper 550 based around the Riva TNT chipset. Like the ATi's Rage 128 chip, it supports full 32-bit colour and has 16Mb of SDRAM. Panrix has included a 2X DVD ROM and, wisely, a Hollywood Realmagic MPEG-2 decoder. Since the



main graphics card does not have DVD support, this hardware decoder is absolutely necessary in order to display the best picture quality. The sound card is Creative Labs' SoundBlaster Live!, a popular choice in this group; powerful, and a welcome companion to the MPEG-2 card. Interestingly, this system has on-board SCSI but it is not used by any of the components. The 9Gb UDMA hard drive occupies one of the 3.5in bays, leaving another one free. A single PCI and two ISA slots are also free. Like Evesham, Panrix has chosen to include both LS-120 and Iomega Zip drives. A moderately large ATX case has three fans that help to keep the interior adequately ventilated. With a 3D Mark score of 1677 and a SYSMark rating of 214, the Fusion is an outstanding performer.

**Although very heavy**, the 19in Iiyama Vision Master Pro 450 is an excellent monitor with a very flat screen. Possessing excellent image quality, it supports a maximum resolution of 1600x1200 at 70Hz. However, its pushbutton controls are not the easiest to get to grips with.

## PCW DETAILS

**Price** £2,696.63 (£2,295 ex VAT)

**Contact** Panrix 0113 244 4958  
[www.panrix.co.uk](http://www.panrix.co.uk)

**Good Points** Excellent components. Top-notch performance. High-quality monitor. On-board SCSI.

**Bad Points** None

**Conclusion** A well-built, high-performance system.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

# Tiny Power Performance 500

**T**iny has an impressive reputation on the high street for building good-quality PCs. The Power Performance 500, with its 500MHz Pentium III, is aimed primarily at the gaming and multimedia market. It has a whopping 256Mb of RAM in two DIMM modules, with one slot free for upgrading. The BX motherboard also has two PCI and three ISA slots free. A 9Gb hard drive occupies one of the 3.5in bays. Interestingly on a games PC, Tiny has chosen Creative Labs' Banshee graphics card. Housing 3Dfx's latest chipset, this is a good games performer. But it's not quite cutting edge technology, as it doesn't support 32-bit colour. There is a DVD



ROM, although Tiny has not included a hardware MPEG-2 decoder. Since the main graphics card does not support motion compensation, software DVD playback could result in lost frames and reduced image quality.

**The Yamaha Waveforce XG** sound card is an excellent choice for a games system. Utilising Sensaura's technology, it produces 3D audio from just two speakers. Tiny has chosen a relatively small ATX case but the interior is adequately ventilated. Build quality is very good, and all components are easy to access.

For a PC with a 500MHz Pentium III, the

Tiny's SYSMark score of 192 is distinctly average. Its 3D Mark score of 1526 is much better. The 19in Taxan Ergovision monitor is a good companion to this multimedia PC. With controls that are easy to access, it can support a maximum resolution of 1280x1024 at 70Hz. Image quality is excellent.

## PCW DETAILS

**Price** £2,113.83 (£1,799 ex VAT)

**Contact** Tiny 01293 821555

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

**Good Points** Decent build quality. Good software bundle. Large monitor.

**Bad Points** No hardware DVD decoding. Mediocre performance.

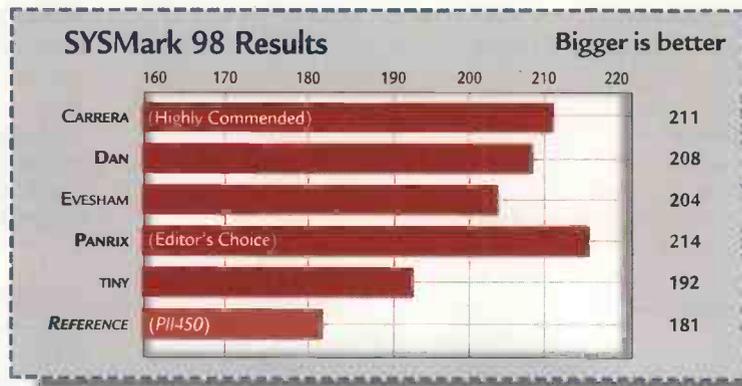
**Conclusion** A system that is not quite as good as the rest.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

## Editor's Choice

**T**he Pentium III débuts at 450MHz and 500MHz clock speeds.

But despite the inclusion of the new instructions, at 450MHz its performance is virtually identical to that of a Pentium II of the same speed. Clearly, applications must be specifically written to take advantage of the new instructions. At the time of going to press, there were no such applications. Therefore, our current SYSMark test, which uses widely available applications, is unable to take advantage of KNI. The results are not misleading, however, as the average user using an unoptimised legacy application is likely to see only the same marginal performance increase. Intel claims that KNI can give a two-fold increase in performance, but this can be achieved only if the applications used are coded in Assembly (see p123). Since most developers are unlikely to opt for this



method, users can realistically expect to see only a 20 to 60 percent increase. Both our SYSMark 98 and 3D Mark 99 benchmarks are currently being updated and optimised to take advantage of KNI. As soon as Pentium III optimised apps become available, these benchmarks will reflect the new CPU's capability.

➔ **All five Pentium III systems** in this group have one common quality: they

are all extremely well built. The Carrera and Panrix systems, however, are in a class of their own. Both come with high-speed DVD and LS-120 drives. Panrix even added an lomega Zip drive and theirs is the only PC

here to have a SCSI controller. Also, both systems have hardware support for DVD decoding. The SYSMark scores of the Panrix and Carrera PCs are also the highest here.

➔ **The Panrix Fusion SCSI 500** wins our **Editor's Choice** award for its scorching performance, high-quality components and decent construction. The **Carrera Maxima**, which has much the same qualities, is **Highly Commended**.



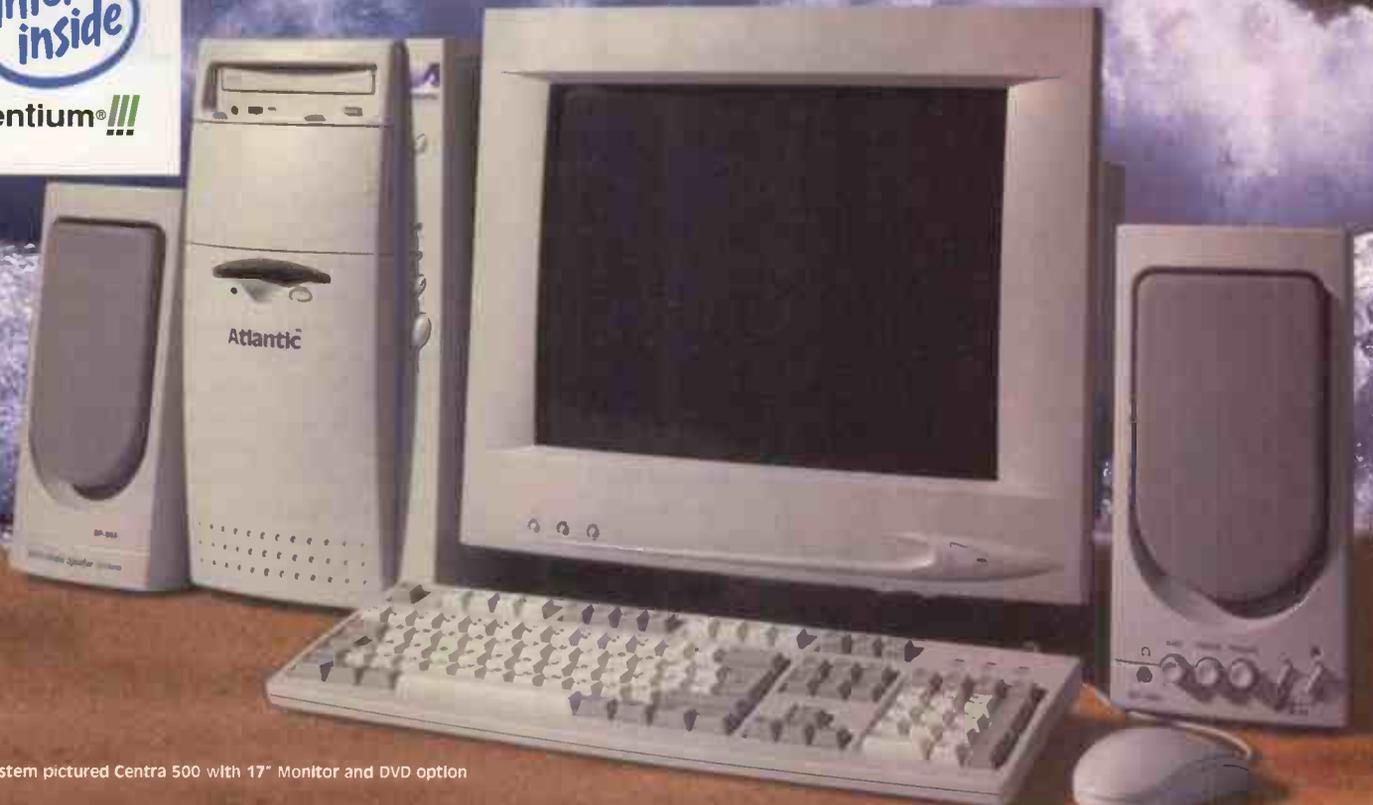
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# Dream on

AFTER LOSING ITS WAY WITH THE ILL-FATED SATURN, SEGA IS BACK WITH THE DREAMCAST, SPORTING AN IMPRESSIVE TECHNICAL SPEC AND SOME SIZZLING GAMES. CHRIS CAIN GETS HIS HANDS ON IT.

**W**hile Sega is still the undisputed king of the arcades, the Japanese games giant has lost its crown on the home front. Once the market leader in games consoles, the company has seen arch rival Nintendo and newcomer Sony run rings around its Saturn hardware. There are many reasons for this, but perhaps the most obvious is that Sega geared Saturn towards traditional 2D action just as the rest of the world, and Sega's own arcade divisions, started to explore the third dimension. The Playstation and Nintendo 64 were designed with the future in mind, boasting dedicated 3D graphics facilities.

Claiming to have learned from past mistakes, Sega is back in the game with its next-generation console. Developed in conjunction with Microsoft and built with fast 3D in mind, Dreamcast aims to bring all of Sega's arcade knowhow into the home. The gloves are off, and there's even an all-new Sonic the Hedgehog game for the system. But is Dreamcast good enough to give its rivals nightmares?

With the hardware due to hit our shores in nine months' time, PCW takes an early look at the console that's already making it big in Japan.

#### External

Abandoning traditional black for a light Playstation-like grey, Dreamcast is certainly more stylish than its predecessor. That said, the machine is only half the size of Sony's Playstation, measuring a mere 190x195x78mm,

and it has a solid feel to it. Even from the outside Dreamcast looks and feels a lot more *designed* than the Saturn ever did.

The front sports the Sega name, four control-pad ports, and a curious 'Designed for Windows CE' logo giving some clue as to Microsoft's involvement. The rear houses power, serial and AV-out connectors, and on our Hong Kong model the latter provides composite and S-Video NTSC output together with stereo audio. RGB will be available via a separate signal connector box from Sega. UK machines will substitute a PAL video signal for NTSC. Sega bundles a composite video cable in the box to get you going, but by the time you read this, S-Video and VGA monitor leads should have been released. It is likely that an RF modulator will also

come with the UK model. The right of the unit reveals a covered expansion slot for future development. In Japan, Dreamcast ships as standard with a 33.6Kbit/sec modem installed in this slot, for multiplayer gaming and other online activities. This was missing from our unit, and Sega has yet to confirm that a modem will be included in the UK model. A 56Kbit/sec model is rumoured for the US.

#### GB-ROM

Like the Saturn, the Dreamcast is a top-loading CD-based unit with Power and Eject buttons positioned either side of the 12-speed CAV (constant angular velocity) drive. However, Dreamcast CDs are actually GB-ROMs, holding 1Gb of information instead of the standard 660Mb. Developed by Yamaha, GB-ROM is a proprietary format which works by packing the pits on the discs closer together to store more information. The GB-ROM drive is fully compatible with music CDs.

Along with more storage, GB-ROMs provide an extra level of copy protection for Dreamcast software developers, as they cannot be reproduced using a standard CD-writer.



With the rise of cheap CD-writers, piracy is a growing concern in the Playstation and PC world, and Sega has come up with what looks like a practical alternative to the more expensive cartridge system used by Nintendo.

### → Taking control

There's certainly a look of Nintendo about the Dreamcast control pads. Each one features a small analogue joystick, a digital joypad, five buttons on top and two analogue triggers underneath. Though comfortable to grip, the pads take some getting used to, and you really have to fight the urge not to automatically pull the triggers every time your fingers wander over them.

Each pad has a small window in the centre that looks down over two expansion slots in the front. These slots are used for Sega's intriguing VMS (Visual Memory System) memory cards. The VMS looks like a miniature

Nintendo GameBoy and features 128Kb of RAM, a 48x32 pixel mono LCD, a d-pad and four buttons. It not only acts as a memory card but can also be used to play small games, downloaded from Dreamcast software titles. These 'sub-games' could include classic 'tamagotchi' virtual pets or puzzles to solve: in fact, Sonic Adventure uses the VMS for a series of sub-games involving characters you meet along the way. The screen on the VMS is visible when the unit sits in the control pad — ideal for displaying things like weapons or map data during play.

The VMS is compatible with Sega's new Naomi arcade system, which is basically a Dreamcast with double the video memory and oodles of RAM. If manufacturers allow for it, players can take game data from home to use in the arcades and vice versa. The first Naomi-based games to hit our streets will be Sega's own House of the Dead 2 and Power Stone from Capcom.

### → Inside

At the heart of Dreamcast is a custom version of Hitachi's SuperH4 RISC processor running at 200MHz. This sits on a 100MHz system bus and delivers some 360MIPS, with 1.4 billion floating-point operations per second. Sega and Hitachi claim this floating-point performance is four times that of a Pentium II 266MHz. The processor also has a 128-bit graphics engine built-in — operating on two 64-bit words of graphical data simultaneously — used for 3D calculations.

The processor is backed by 16Mb of main RAM and 8Mb of video memory, eight times that of the Sony Playstation. Dreamcast's extra main RAM will allow for larger games and reduced disc access, while the extra video RAM will be handy for housing valuable textures and image maps.

Sega has opted for a second-generation PowerVR chipset, the 2DC, to handle graphics.

Developed jointly by British multimedia specialist VideoLogic and NEC in Japan, this is a vastly improved version of the low-cost 3D accelerator that first appeared on PC graphics cards. Designed for arcade use, it can render between 3 to 3.5 million polygons/sec. Sony's Playstation peaks at around 1 million polygons/sec — 350,000 when complex textures are applied. The more polygons a system can display simultaneously, the more detailed 3D models and images can be.

Many observers believed Sega would opt for a graphics solution from 3Dfx for Dreamcast. It has been confirmed that there were two versions of the system under development. Black Belt was the codename for a 3Dfx system in the US, while PowerVR was used in a Japanese project known as Dural and later Katana. The Japanese model ultimately proved better suited to Sega's needs.

### → 3D features

Dreamcast's main 3D features include perspective-correct texture mapping, gouraud shading, point, bi-linear, tri-linear and anisotropic mip-map filtering, 16 levels of transparency, fogging, texture compression, bump mapping and full-scene anti-aliasing to help smooth out harsh jagged edges. VideoLogic claims this is similar to the forthcoming 3Dfx Voodoo 3 system. Output to TV is at 640x480 pixels with 24-bit colour, but images can be super-sampled down from 1024x768 pixels. The PowerVR 2DC chip can look at the extra information in the high-resolution image and use it to produce the best approximation for display on the TV, giving the appearance of a higher-resolution display. However, none of the current titles use this facility.

### → The speed of PowerVR

PowerVR's speed is partly due to the fact that it only calculates and renders that which is visible to the user. This is very different to traditional 3D technology, where pixels can be textured, shaded, drawn and then completely obscured by other



## The Windows CE connection

**M**icrosoft was heavily involved in the development of Dreamcast, and as a result the system runs a streamlined version of the Windows CE operating system. This incorporates key elements such as the WinCE kernel, for pre-emptive multitasking and managing system resources, file handling, communication APIs

for dealing with the internet, and special support for Japanese language characters. Functions such as window management and cursor support have been removed, and all critical loops are coded in Assembler. Windows CE also incorporates the DirectX components DirectDraw, Direct3D, DirectSound, DirectPlay, DirectInput

and DirectShow, hand-tuned to take full advantage of Dreamcast's features. A key weapon in Sega's battle with the competition, this allows Windows developers to easily port their titles to Dreamcast and vice versa. Instead of waiting a year for a cut-down conversion of the latest PC blockbuster,

Dreamcast owners could see a high-quality transfer in a matter of months. The only danger here is that this could lead to a flood of poor-quality titles hitting the machine, and Sega must set up a strict quality control program to ensure this does not happen. Microsoft has a produced an SDK for Dreamcast developers

based on Visual C++, but developers don't have to use Windows CE to program their titles and none of the launch titles employed it. There have also been questions raised about possible performance overheads, although some developers who've used the system have been impressed by the speed on offer.



**FAR LEFT** EASILY THE MOST IMPRESSIVE LAUNCH TITLE, **VIRTUA FIGHTER 3TB** HITS THE DREAMCAST  
**LEFT** GODZILLA TAKES ON TOKYO (AGAIN)



▲ **SONIC ADVENTURE** SEES SEGA'S STAR RETURN IN A 3D WORLD THAT'S LIGHT YEARS AHEAD OF MARIO 64

pixels later on. PowerVR also breaks its displays into small regions, or 'tiles', which can be rendered independently — even by multiple processors. This approach makes the technology scalable and it is likely that we will see more powerful Naomi arcade machines featuring additional PowerVR chips.

Perhaps that expansion slot on the Dreamcast has another use, too...

For audio Sega has opted for a 32-bit Yamaha processor with its own 2Mb of audio memory. The chip features 64-voice polyphony, hardware audio compression, pseudo 3D sound (it would have been nice to see Dolby Digital) and a DSP

for real-time effects.

Other items of interest inside include 128Kb of flash RAM for storing time and date information, and an amazing liquid cooling system for the main processor and PowerVR chip that actually uses purified water along with a traditional heat sink and fan to prevent the system from overheating.

### Conclusion

Dreamcast's impressive technical specification puts it head and shoulders above the competition, and with its fast 3D engine and Windows CE/DirectX compatibility (see box, above) it is far more what we expect from the arcade

innovator that produced the MegaDrive. The launch titles, Virtua Fighter 3tb and Sonic Adventure, are on a par with the latest PC offerings, and Sega will no doubt sell thousands of units on the strength of Virtua Fighter 3tb and Sonic Adventure alone. It will certainly be interesting to see the first PC-ported games.

However, it is unlikely that Sony or Nintendo will initially lose much sleep over Dreamcast. While Sega is obviously a threat, both companies have large installed bases, and with graphics power ever increasing you can bet that Playstation 2 and Nintendo's next machine will offer yet another leap in performance. But if Sega works hard in the interim period and can produce flawless conversions of its arcade hits, the blue hedgehog may be leader of the pack once more.

### PCW CONTACTS

**Price** 29,800 Yen (approx £150).  
**Review machine** from Playtronix  
01329 312211

**Price** £389 (Dreamcast, one controller, AC cable, AV stereo cable, Virtua Fighter 3tb, VMS memory, 240-110V transformer, UK next-day delivery).

No UK price set. Launch expected September 1999

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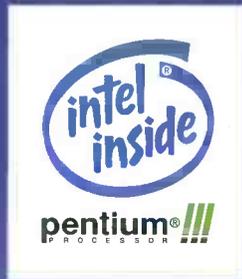


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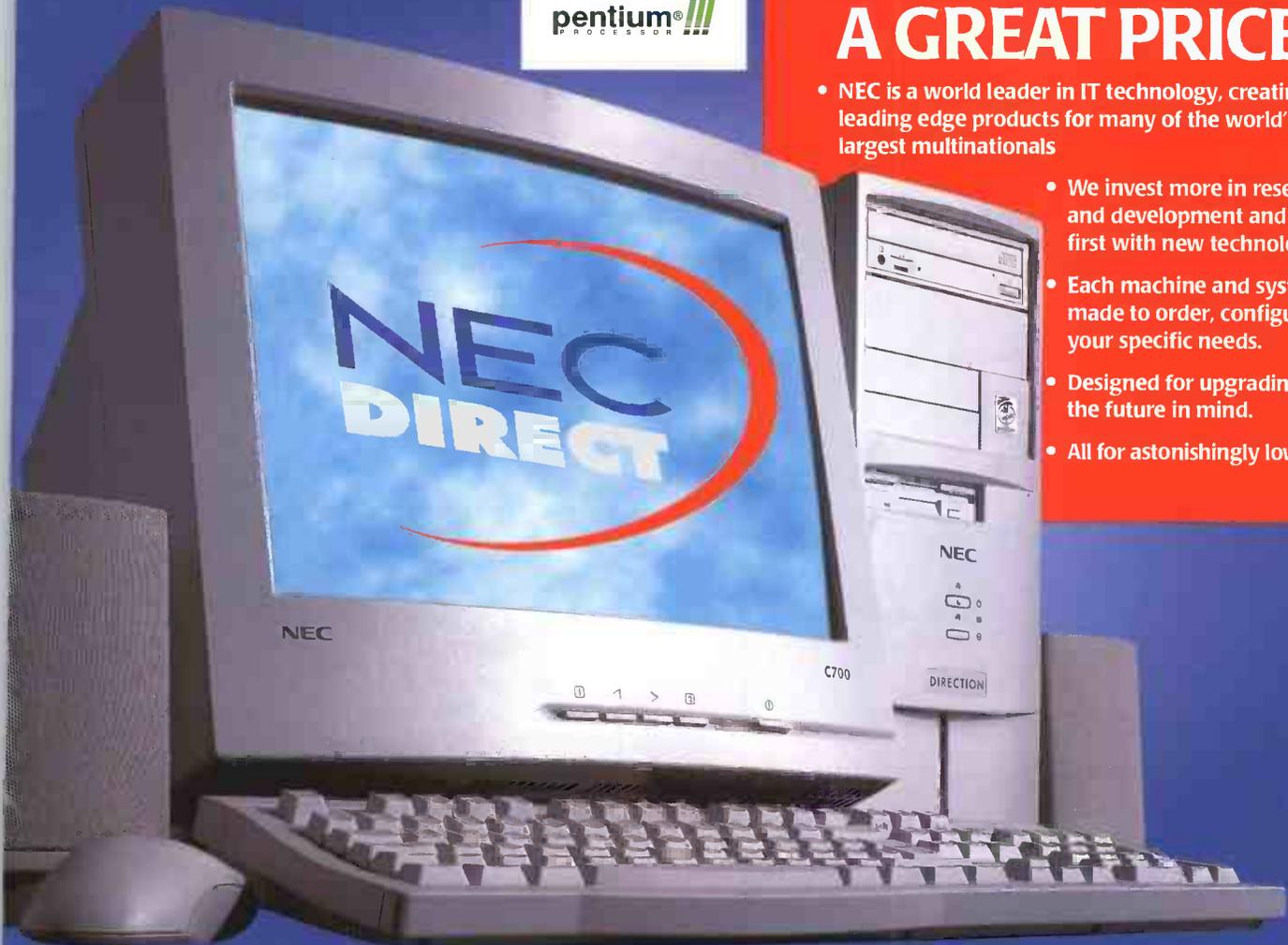
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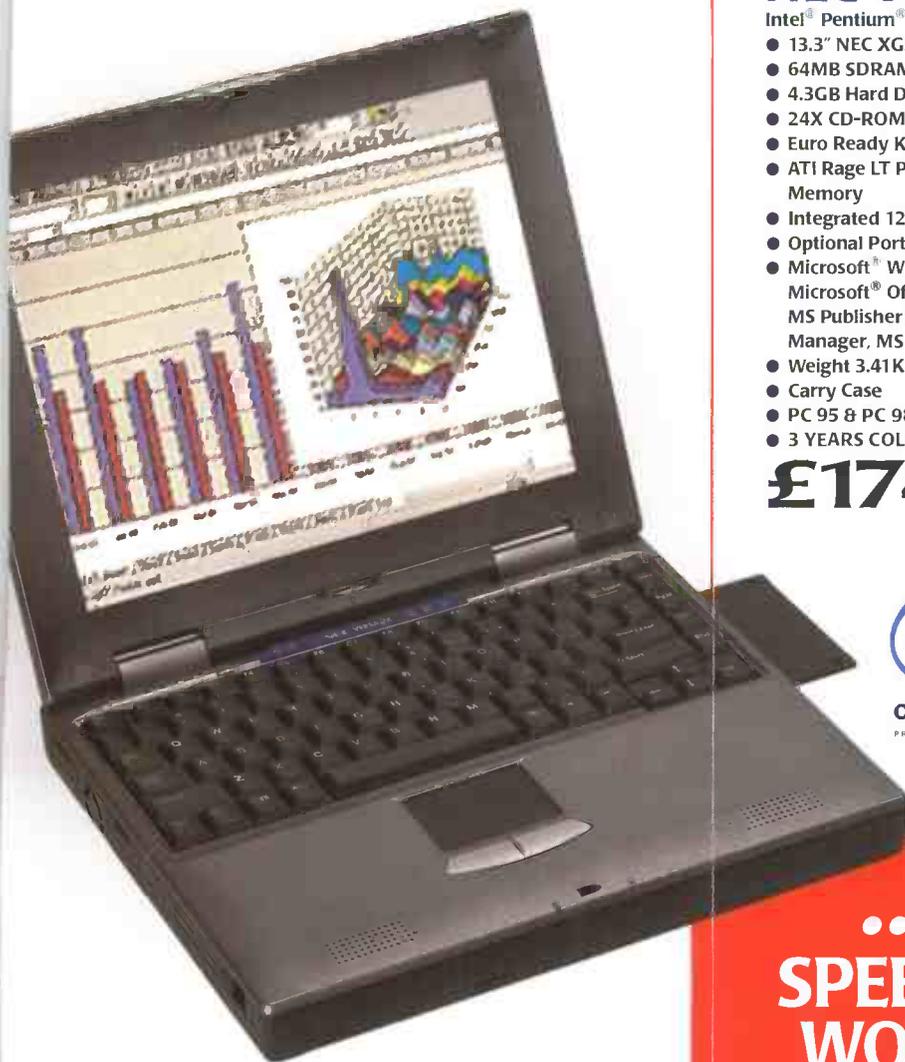


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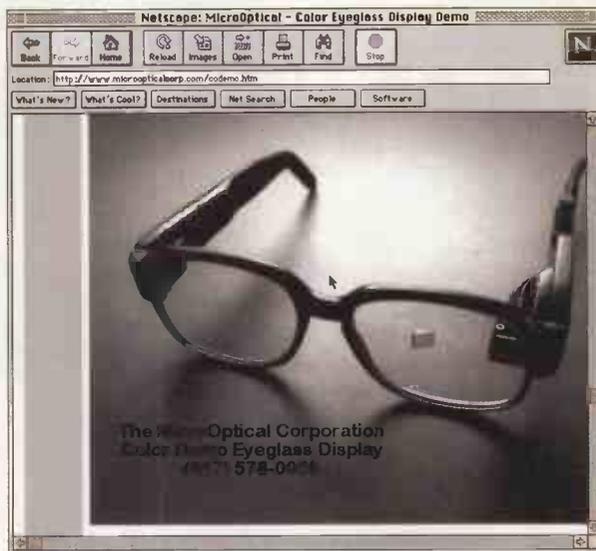
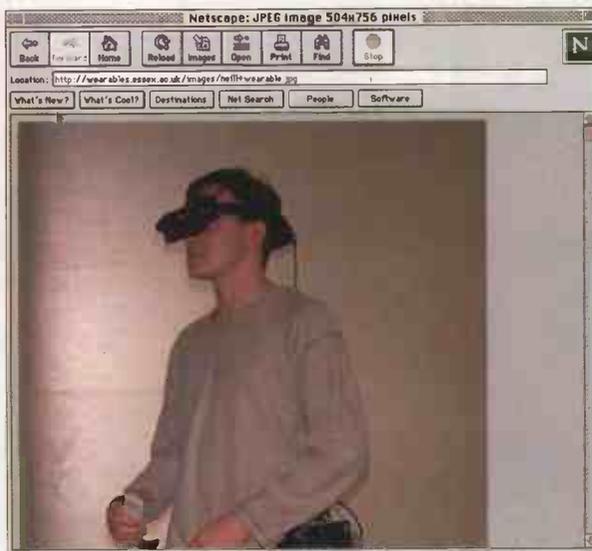


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**N**othing has dated more than the past's idea of what the future might look like. Twenty years ago, scientists only had to utter the words 'by the year 2000' to conjure up images of bacofoil suits and cities on the moon. Ironically, astronomical budgets prevented cities in the stars from becoming a reality, although with today's cut-price space programme we can explore the cosmos for less than the cost of a cinema blockbuster. But what about those hi-tech suits?

One feature common to many visions of the future has stuck in the popular imagination and is fast becoming a reality in the real world of 1999 – the wearable computer; technology so portable and intuitive that we can slip it on in the morning along with our clothes, bringing a whole new meaning to the term 'personal computing'. We're already seeing the rise of global networks, thanks in part to the hundreds of new communications satellites set to circle the globe by the turn of the

SUITS YOU, SIR. CHRIS RYE

SLIPS INTO WEARABLE COMPUTERS AND FINDS A WORLD OF NEW POSSIBILITIES.

century. These networks may be the big driver for wearable computing, as they allow true international roaming outside the boundaries of national telecoms infrastructures. Throw in a cellular modem and a GPS system, and the world is at your fingertips. The computer could be leaving your desk, perhaps forever, and its horizons may be limitless.

Much of the research into wearables is based in North America, at universities such as Oregon and Toronto. One of the half-a-dozen key figures is Dr Steve Mann, who has worked on his 'WearComp' and 'WearCam' (camcorder/computer hybrid) ideas for 20 years. He began his research at high school and continued it at the Massachusetts Institute of Technology (MIT), where he completed a PhD in 1997. He's now at Toronto.

'Wearable computing facilitates a new form of human/computer interaction, comprising a small body-worn computer (e.g. user-programmable device) that's always on and always ready and accessible,' Mann explained to delegates at the 1998 International Conference on Wearable Computing in Fairfax, Virginia.

Dr Mann, and other American academics at the forefront of this research, such as Bradley Rhodes (also of MIT's media lab), insist their wearable computers are different from the personal digital assistants (PDAs) available on the high street today. PDAs include PC-compatible 'notepad' devices such as the familiar Palm Pilot, and also the host of portable devices that may spring from alliances such as Symbian,

the joint venture of Psion, Nokia, Ericsson and Motorola, which opens up the possibility, say, of your mobile phone and personal organiser sharing an infra-red link.

But today, the difference between the wearable and the PDA, explains Mann, is that a WearComp is 'subsumed into the personal space of the user', while having the full functionality of a computer system 'inextricably intertwined with the wearer.' What this means in practice, is the user having one or more of his senses, even his intelligence, augmented by WearComp or WearCam-style devices, built into familiar-looking items such as spectacles, headsets and, for the less conservative user, baseball caps. There's no available research on whether these should be worn back to front. Head-mounted displays (HMDs) of this kind, where binocular or minocular arrays are built into adapted or specially built headgear, form the bulk of wearable computing prototypes from MIT, Digiman, MicroOptical and other US companies.

If Mann is right about wearables, augmenting human capabilities with the advantages of state-of-the-art computer power, such as rapid calculation, vast databases and information filtering, the future may be so bright, you'll have to wear shades. Nevertheless, for the home and business user, UK-led developments in PDAs and deregulated telecoms might clear the path for the commercial success of these devices whatever the US evangelists say.

Yet for all Mann's talk of wearable computers un-monopolising [sic] the user's attention — i.e. allowing computing to become as automatic to you as breathing, the processing power behind these devices is much the same as you'll find in an ordinary laptop: fast chip, small hard drive, albeit with a modem you can rove with. So the potential is greater than the reality, thanks to the eternal problems of network bandwidth, which is where satellite, cellular and even digital TV and radio networks could help. But the innovation lies in the way wearable devices interact with the human body, networks and each other.

The fact that wearable computers are, like wristwatches, always switched on could be a boon to both home and business users. Instantly, you'd have a 24-hour intelligence resource that flashed information via laser or minute LCD screens into your headset, definitely for your eyes only. And, were the image to be projected onto a pair of transparent glasses, as it is in MicroOptical's prototypes, it would overlay a computer read-out onto your conventional view of the world, something MIT calls 'augmented reality'. So, we accept the watch, the mobile, the Walkman

and the personal organiser; why not the wearable computer? One answer, at the moment, is they're not that wearable. The key to their commercial success is making them unobtrusive and safe, and certainly less bulky. While prototypes like the MicroOptical goggles are slim and lightweight, wearable computing lore demands the user wear them day and night — impractical for even the hardened fashion victim (unless they wear glasses anyway).

Other wearable computers have been developed by MIT's Bradley Rhodes, which are mounted on the side of the head, allowing the user to peer into an eyepiece to access the visual display. But this might alarm a medical community already alerted to the dangers of proximity to low-level, microwave radiation from mobile phones.

**O**ther than efficiency, mobility and privacy, another significant application of making humans smarter with a cool, wearable device could be security. Your security. StartleCam, an evolution of Mann's WearCam prototype, has been developed by Jennifer Healey at the MIT media lab and is another head-mounted device. Activated by sweat when the wearer is frightened (like a lie-detector), the StartleCam could scare off muggers in the street, store audiovisual information about them on a remote server, or even dial 999. This suggests that when wars are won by superior information,

## The innovation lies in the way **WEARABLE DEVICES INTERACT WITH THE HUMAN BODY**, networks and each other

the camera is more powerful than the gun. Helping the wearer by augmenting his or her abilities in this way would lead, say the idea's fans, to a very real form of personal empowerment, and could even let wearers monitor possessions such as their house or car remotely, a sort of social micromanagement for the neurotic 90s. So, if you want to be a photoborg entity, a cybernetic organism always seeking the best picture in all aspects of day-to-day living, go to [www.wearcam.org](http://www.wearcam.org), where you'll feel at home.

Then there are cultural obstacles. In the UK, Neill J Newman, a researcher at our own Essex University [see page 136], explains: 'The computer has become smaller, lighter and more powerful, but the way we use it is still analogous to the large mainframes of yesteryear.' And a lot has changed since then. Intelligent agents (proactive web search software that learns your

## NEW DEVELOPMENTS

### → Casio Satellite Watch

In June, Japanese electronics giant Casio will launch worldwide a gadget for fans of the great outdoors 'who have everything but a sense of direction': a wristwatch that pinpoints the wearer's position by satellite, says Reuters. Built as a navigation aid, the GPS transceiver works by using information drawn from 27 satellites to pinpoint the wearer's geographical co-ordinates. 'If you wear this wristwatch, you will never get

lost when you go mountaineering,' claims a Casio spokesman.

### → Xybernaut

US vendor Xybernaut, formerly Computer Products & Services, is establishing a network of specialist resellers to move into vertical markets, such as utilities, aviation, medicine and the military with its existing, wearable products. Its web site [www.xybernaut.com](http://www.xybernaut.com) explains the products are targeted at 'data capture,

processing, display and communication for mobile individuals', and use a variety of different inputs, including voice recognition, and outputs such as head-mounted displays (HMDs).

### → Sulawesi

Similar in intent to the Xybernaut range of products, Sulawesi is a technology framework for wearables developed by Essex University. The current implementation, Sulawesi 0.1, 'utilises speech recognition, keyboard input

and a networked input'.

The framework is optimised for Java and, as well as obeying the wearer's commands, it also monitors the user's environment. Sulawesi could work just as effectively with infra-red beacons, says the university, as it can with GPS systems to establish the wearer's location. For more information and downloadable programs, go to [www.wearables.essex.ac.uk/sulawesi/introduction.html](http://www.wearables.essex.ac.uk/sulawesi/introduction.html).



▲ **PROTOTYPE INTELLIGENT FOOTWEAR, BY MIT'S REHMI POST. CONTAINS SOFTWARE AND BOARD TO CREATE A 'PERSONAL AREA NETWORK' (PAN), WHICH CONFINES NETWORK ABILITY TO THE WEARER AND ANY DEVICE HE OR SHE INTERACTS WITH. IN THIS WAY A DOOR, FOR EXAMPLE, COULD BE PROGRAMMED TO OPEN ONLY TO THE WEARER OF A PAN-ENABLED WEARABLE DEVICE**

preferences), face and voice-recognition systems, together with the capabilities of a global comms network, all suggest a promising future for the wearable computer.

Consider this: attentive, electronic secretaries that work with you 24 hours a day, recognising your face, obeying your voice commands,

retrieving mail or taking dictation at the blink of an eye or the click of a finger (no need for keyboards when you have that spatial recognition interface to read your hand movements).

Add Japanese skills in miniaturising consumer electronics to this, and your wearable computer could have, say, MP3 audio compression, allowing you to download and store large sound files in a device no bigger than, well, an MP3 Walkman. And with recordable disks and digital radio/TV on the upward curve of consumer acceptance, who knows what devices may emerge? NCR has even built web access into traditional household items. Link these to your wearable computer, and your microwave could soon be emailing you to buy chips while you're at the supermarket.

By now, of course, cynical British minds will be finding it difficult to ignore the eccentric side of wearable computing, which isn't helped by the fact that early research models made the wearer look like Robocop. (VR helmet, anyone?) But this sort of prejudice can be overcome in time.

Robocop isn't far from the truth, however. HMDs and HUDs (head-up displays: visual interfaces positioned above eye level) were originally developed for the military, specifically fighter pilots, to enable them to operate complex guidance systems in flight. The result was eye movement-operated weapons and information access. Today's computing power coupled with state-of-the-art miniaturisation is taking these devices out of the cockpit and turning footsoldiers into hi-tech hunter-gatherers in the information war. Certainly DARPA, the US Defence Advanced Research Projects Agency, has funded wearable 'combat management systems', but, as yet, lightweight systems don't count for much against the rigours of the battlefield.

Meanwhile, for the corporate grunt, you may soon be able to take wearability to its logical extreme. MIT is developing intelligent clothes made from woven computer circuitry and operated from a sleek, electronic glove. If these experiments make it past the concept stage, computer clothing, powered by the minute voltages in the human skin, could redefine 'power dressing' and 'smart suits' for the 21st century cyborg about town. Great strides are being made, if you'll pardon the pun, and if the applications are anything more than just a marketing ploy, you'll soon be clinching complex deals with a data-handshake, while stacking that essential corporate data into your ever-expanding shoulder pads. The person in the Terabyte suit? It could be you.

- **Xybernaut** [www.xybernaut.com](http://www.xybernaut.com)
- **Sulawesi** [www.wearables.essex.ac.uk/sulawesi/introduction.html](http://www.wearables.essex.ac.uk/sulawesi/introduction.html)
- **MIT general web site** [www.media.mit.edu/projects/wearables](http://www.media.mit.edu/projects/wearables)

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Jan Ostrowski

# Broadcast news

YOU'VE HEARD THE HYPE AND SEEN THE ADVERTISEMENTS, BUT IS **DIGITAL TV REALLY READY NOW**, OR ARE THERE STILL TECHNICAL AND PRACTICAL ISSUES TO BE ADDRESSED? ADELE DYER PUTS YOU IN THE DIGITAL PICTURE.

# W

e have all seen the ads: TVs about to throw themselves off high buildings until they are given SkyDigital, Stephen Fry asking

his television to pass the salt, and so on. But is this enough to persuade you to be an early adopter, or should you wait until the system is well established and well supported?

Currently, there is one obvious stumbling block to digital. The service we have now may not be the service we have in a few years' time and the equipment needed to receive the signals may also change. So should you choose digital TV now or wait until everyone, including the broadcasters, are a little more clear on just what services they intend to offer? All analogue television is due to be phased out in the next ten to fifteen years, so sooner or later you will have to jump onto the digital bandwagon. The main question is, 'when?'

**Digital is ones and zeros** rather than waves as in analogue broadcast, and this difference brings about a shake-up in the way that television is broadcast. In the past, the free-to-view channels were mainly only available via a terrestrial aerial and everything else was from satellite. With the advent of digital broadcasting, the BBC, ITV, and Channels 4 and 5 are required to transmit 80 percent of their programmes simultaneously, either through terrestrial analogue aerials or digitally to terrestrial aerials, satellite dishes or cable, and these are all free to view. Additional digital services are available from Sky and OnDigital, although these have to be paid for.

All digital TV broadcast in Europe conforms to a standard known as DVB (digital video broadcast). However, each broadcaster uses a different modulation technique according to the broadcast medium they use. Satellite broadcasters use QPSK modulation, digital terrestrial uses OFDM (Orthogonal Frequency Division Multiplex) and digital cable transmission uses 64QAM. This has an impact on the viewer in their choice of set-top box as they will need one that is specific to the digital medium they are using.

A set-top box is essentially a decoder which can receive the signal, strip out the programme data from the transmission data, decode the compressed file and convert the digital signal into an analogue signal which the TV can display.

Most broadcasters are pushing digital TV to the consumer based on the incentives of more programmes, better picture quality and, in some cases, widescreen broadcasts. Currently most films, some drama and the news is delivered in widescreen format from the BBC, but this still makes up only around 25 percent of their peak

time evening viewing on digital and few analogue programmes are broadcast in widescreen. It is an undisputed fact that picture quality is very much improved, and the same quality is maintained from the time it leaves the broadcaster to when it reaches the viewer. This is rarely the case with analogue broadcast techniques.

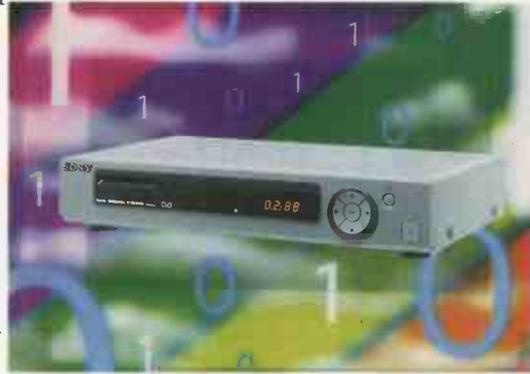
**Digital TV could potentially offer** far more than a wider choice of programmes. It allows for a compromise between two extremes: greater quality and more programmes. Digital broadcasts take up far less bandwidth than the existing analogue versions. Over 30 digital channels, offering the same picture resolution and stereo sound, can be transmitted within the same amount of bandwidth required to send just five analogue channels. If higher-quality digital broadcasts were sent, greater bandwidth would have to be used, yet the picture and sound quality would be much greater than that of current digital broadcasts.

Current PAL analogue provides a resolution of 625 lines, with 480 lines appearing on your television set. Standard Definition Television (SDTV), the standard presently used by most digital

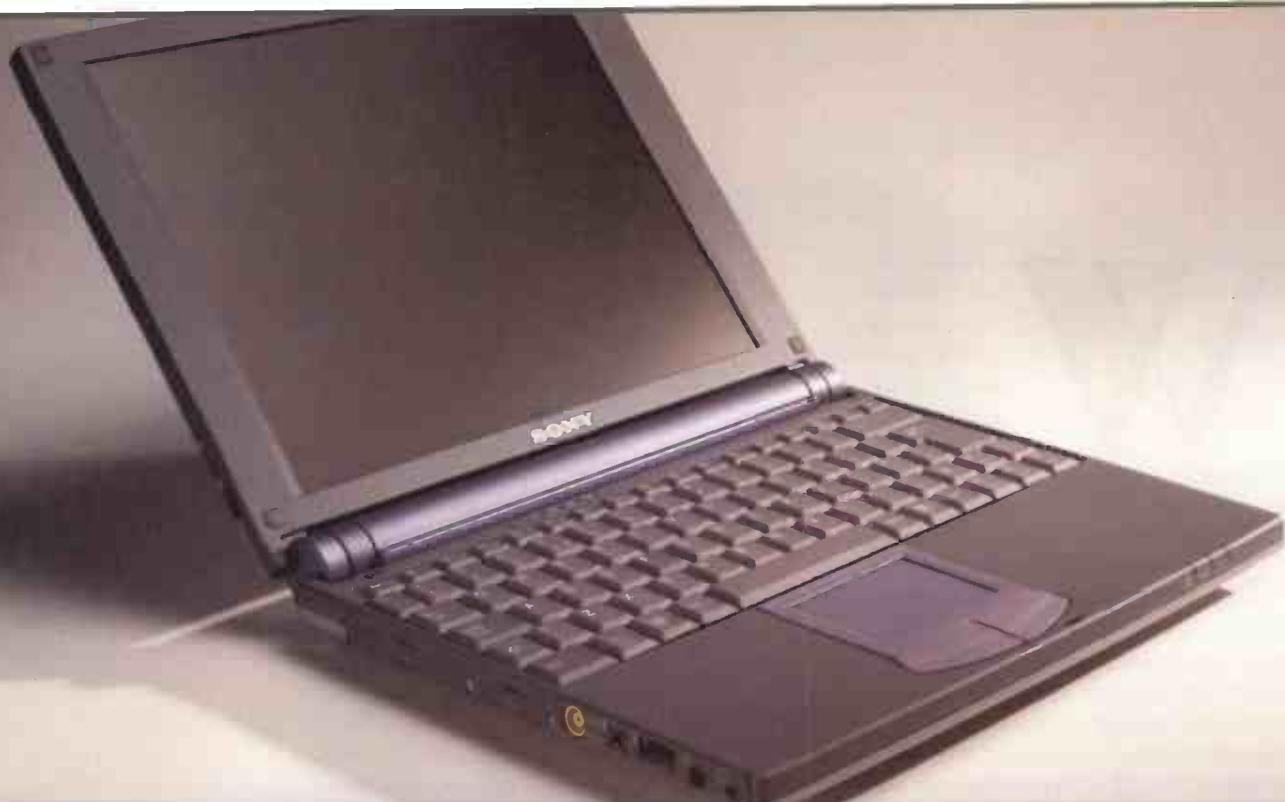
broadcasters, sends the same number of lines although the quality will not be impaired. HDTV (high definition television) can almost double the resolution, with up to 1,080 lines being transmitted. However, the HDTV specification most often quoted is 720 lines as this uses progressive scanning — that is, it uses a non-interlaced signal — and as any monitor user can tell you, a non-interlaced signal gives you a much better-quality picture.

**The FCC (Federal Communications Commission)** standard for HDTV in the US includes AC-3 audio in the specification. This allows for surround sound made up of 5.1 channels of audio, each of which can be sent to up to five separate speakers and a subwoofer. In other words, if you have a complete home cinema setup, you should theoretically hear as good a sound as when playing your DVDs. Also included in the US HDTV standard is provision for additional data to be broadcast with the programme. This could be anything from scrolling text to software downloads.

The bad news is that if you add all this together, you'll end up with high bandwidth requirements to transmit it all and some very expensive equipment both for the broadcaster



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PC Magazine, 1998



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and the viewer. Even in the US it is estimated that only 100 people have the equipment to receive HDTV signals in their homes. But the *really* bad news is that we are unlikely to see HDTV for some years to come. The standard has not been ratified in Europe and many broadcasters are loath to give up bandwidth to higher-definition transmissions just yet, especially while they see how the current system works and while so few viewers have equipment that is good enough to notice the difference between SDTV and HDTV.

Michael Gleave, technical adviser at the BBC, says: 'Our view is that if you look at a standard screen size from a reasonable distance, the difference...between DVB and HDTV is not dramatic. But as screen sizes get larger and we start to see new technologies such as plasma, which will be in the home in four to five years, then there is an argument for HDTV. The BBC is monitoring the situation carefully.'

HDTV would have an impact throughout the broadcast chain, requiring a hike in the quality of scenery, costumes, cameras and transmission equipment, through to the units we need to receive it in our homes.

**The current system for digital TV** is not without its problems. Only some of the UK is covered by digital broadcasts, and, as a digital signal does not degrade, unless you get good reception you will see no picture at all. Digital TV does mean an end to ghosting and noise, but there again you might be left looking at a big, black blank.

Similarly, widescreen is a wonderful advance for those who have widescreen TVs. For those of us with standard boxes, with their 4:3 ratio, widescreen broadcasts can be more trouble than they're worth. Widescreen comes in a 16:9 ratio, so to show this on a 4:3 ratio TV, broadcasters have three main choices:

- To show it in a 'letterbox' format. You get the whole width of the picture but there are large black bars above and below it.
- To crop a bit off either side, taking the ratio aspect down to just 14:9, which still leaves you with black lines top and bottom although they are relatively thin.
- A 14:9 cropped picture can be squashed sideways and stretched in height until it is forced to fit a 4:3 screen. But while this will force the picture to cover the whole of the screen, it has obvious drawbacks as it makes everything, including the actors, look taller and thinner than they are and thus unnatural.

Then there is the question of whether or not you want to pay now for expensive equipment. With set-top boxes costing up to £300, do you choose one of these now, or wait to see how the technology develops?

If the compression or signal modulation technique changes, your set-top box should be capable of adapting to the new signals automatically. However, with the nature of set-top boxes likely to change soon and with the possible inclusion of storage, internet access and links to your other home entertainment systems on your set-top box, do you really want to spend this money now? Do you even need a set-top box, or should you buy one of the new breed of digital TVs which will integrate set-top boxes within them? Sony has just launched two flatscreen CRT TVs (28in and 32in) both of which receive free-to-view TV channels and are upgradeable to receive pay digital TV signals.

**The biggest sea change** might come with the convergence of digital TV and PCs. At the moment, the two could not be more different.

Digital broadcasting raises two interesting

questions for the PC user: will I be able to access the internet via my set-top box; and will digital TV mean the picture will be better on a monitor, with its non-interlaced high refresh rates, than on a TV set? Several companies already offer

internet boxes which let you view web pages and send and receive email using a TV. In these cases the TV acts in much the same way as would a monitor on a PC and the boxes act as stripped-down PCs, usually containing a hard disk and a modem for communication with the ISP.

Perhaps the best known version of this is WebTV from Microsoft, although apart from a limited number of trial users, no-one has access to it in the UK. WebTV lets you connect an

## All analogue television is **DUE TO BE PHASED OUT** in the next ten to fifteen years

internet box, running Windows 98, to a local ISP. The 1Gb hard disk lets you set the machine to download large amounts of data overnight.

You can also access the internet via satellite. Eutelsat runs a service which lets you download information to your PC via satellite, and upload via a modem. Instructions to access a web page are sent via modem to the ISP and the page then arrives at your desktop via satellite, with data transfer rates of around 2Mbit/sec. But this does not mean that internet access will arrive via our TV set-top box just yet.

▼ SONY WEGA  
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A VERTICALLY  
FLAT SCREEN



Broadcasters seem coy about distracting viewers from the main business of watching TV. The BBC has plans to broadcast an additional information service later this year; a kind of enhanced teletext with improved text quality and graphics. A service similar to BBC Online could subsequently become available as set-top boxes may in future contain some sort of storage medium. Not only will the content be richer than Ceefax, but it will be available to view immediately rather than waiting for the pages to be broadcast, as in the present basic teletext system.

**Real internet access via your TV** will have to wait. As the BBC's Gleave puts it: 'It will be a little while before we see full internet services, but the industry is moving that way. We are seeing a convergence of technologies and so the services that run on top of that technology will also converge.'

The likelihood is that this internet access will use the existing telecomms infrastructure, whether over phone lines, cable or satellite, as this allows for a greater degree of interactivity. Cable could be the ideal platform for this, although movement towards this is very slow for both phone and TV. Links between a TV set-top box and a PC could be made easier by a common platform, though. The Digital TV group is currently developing DVBJava as a possible solution.

**For those who want to display TV** on their PC, the future looks equally mixed. The problem lies in the way in which TVs and monitors draw the image on the screen. A TV interlaces its

images, drawing every other line before going back to the starting point to draw the lines in between, while a monitor will use progressive scanning, drawing each line in turn. PC users in America are fortunate: ABC, NBC and Fox have all come out in support of the progressive format for digital broadcasting.

We may not see the same happening here for some time yet. Henry Price, senior technical policy adviser at the BBC, explains: 'We will be continuing to use the normal 625-line interlace format on digital TV. It is compatible with all the TV sets that people will be using to watch the digital TV transmissions and with all the studio cameras. For display on the PC, the picture will have to be converted to progressive format. It was felt that it was better to load this extra processing onto the PC rather than having a progressive-to-interlace converter in the digital set-top box, which is a very price-critical item at this stage.'

But it's not all bleak. Intel has announced an all-format software decoder for HDTV to work with KNI [see our *Pentium III feature*, page 122]. Also available is a set of cards from Broadlogic, a subsidiary of Adaptec, which converts interlaced TV pictures into a progressive image to provide the best image on a PC monitor.

**So should you buy now** or should you wait? If you are prepared to purchase now, and then again at a future date, there is no reason why you shouldn't go ahead and benefit from the extra channels. However, if you want outstanding quality, you could wait and get a metre-wide plasma screen, HDTV video and AC-3 sound for that complete home cinema experience. □

## HOW DIGITAL TV WORKS

All digital broadcasts use MPEG-2 encoded data. MPEG achieves a high compression rate by using the JPEG algorithm: data is stripped away to reduce file sizes, although the reduction cannot usually be seen by the human eye. It then stores only the changes between one frame and the next, so any data which stays the same for each frame is automatically dumped. This results in variable compression rates and different rates needed for different programmes. Compare TV's *Gladiators* and the Alan Bennett *Talking Head* monologue. The first has lots of action, with contestants and the camera moving around rapidly. The second is one actor talking to the camera, perhaps moving their head and their

hands while the camera remains still. Picture frames in the first example change constantly and cannot be compressed much, so the programme needs a great amount of bandwidth. Conversely, the second can be greatly compressed and so needs far less bandwidth.

As a result, TV broadcasters may want to allocate their bandwidth dynamically. Each is given a certain amount of space on a multiplex line and it is up to them how they fill it. Sky and the BBC have different approaches. The latter chooses to allot a fixed amount of bandwidth to each channel because dynamically allocating bandwidth is overly complicated when you take regional programming into account. If it needs

more than the allotted bandwidth, the picture quality doesn't suffer unduly. Sky allocates its bandwidth dynamically so when necessary it can allow more to such topics as sport. MPEG-2 allows for various resolutions and frame rates, supporting PAL and NTSC through to HDTV and CD-quality audio. It is the default standard used by DVD so all digital TVs will be able to display MPEG in the future. MPEG encoding is processor-heavy yet most stations will encode in real time as the broadcasts leave the TV station, allowing programmes to be broadcast immediately. The BBC takes this one step further, sending all its digital output through the real-time encoder, whether live or pre-recorded.



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- Stereo premium speaker system
- PC-TV system
- Video capture and Teletext
- Full VideoPhone including colour video camera (RRP £149)
- Extra features, benefits and software as listed opposite

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- 128Mb high performance SDRAM (PC-100)
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- 15" SVGA 0.28dp colour screen
- 56k Rockwell voice/fax/data/Internet modem with FREE Microsoft 30-day Internet trial
- 8Mb ATI Xpert98 AGP x2 Rage Pro 3D graphics
- Creative Labs SoundBlaster 64v 3D PCI wavetable stereo sound
- 4x DVD-ROM drive with MPEG-2 playback and decoder (also functions as fast CD-ROM drive)
- Advanced motherboard with Intel 440BX 100MHz AGP chipset
- Stereo premium speaker system
- PC-TV system
- Video capture and Teletext
- Full VideoPhone including colour video camera (RRP £149)
- Extra features, benefits and software as listed opposite

### 400-2s DVD 3D

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- 128Mb high performance SDRAM (PC-100)
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- Creative Labs SoundBlaster 64v 3D PCI wavetable stereo sound
- 4x DVD-ROM drive with MPEG-2 playback and decoder (also functions as fast CD-ROM drive)
- Advanced motherboard with latest AGPx2 100MHz chipset
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- 24x CD-ROM drive
- 1.44Mb floppy drive
- 128-bit 3D 2Mb graphics
- TV-Out for large screen
- 3D Wavetable stereo sound
- Built-in speakers & microphone
- 512K high performance cache
- Doze, sleep and suspend modes
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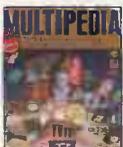
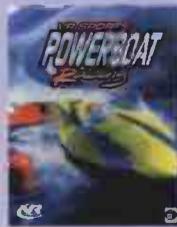
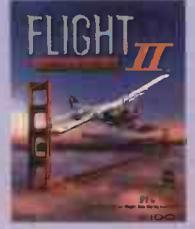
# Exec models with finance options

**EXEC Models** £99 + VAT = £116.33 Extras Include Joystick; PC gamepad; headset microphone; top games (RRP £145) including Tomb Raider II, Flight Unlimited, Powerboat Racing, Red Alert Command & Conquer and Incoming; 10 educational/leisure CD pack (RRP £325) and 4 GCSE titles - Maths, English, Science and German. Notebooks include Autoroute Express instead of Incoming

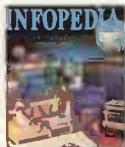


## The Best Games

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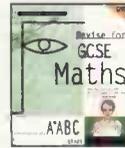
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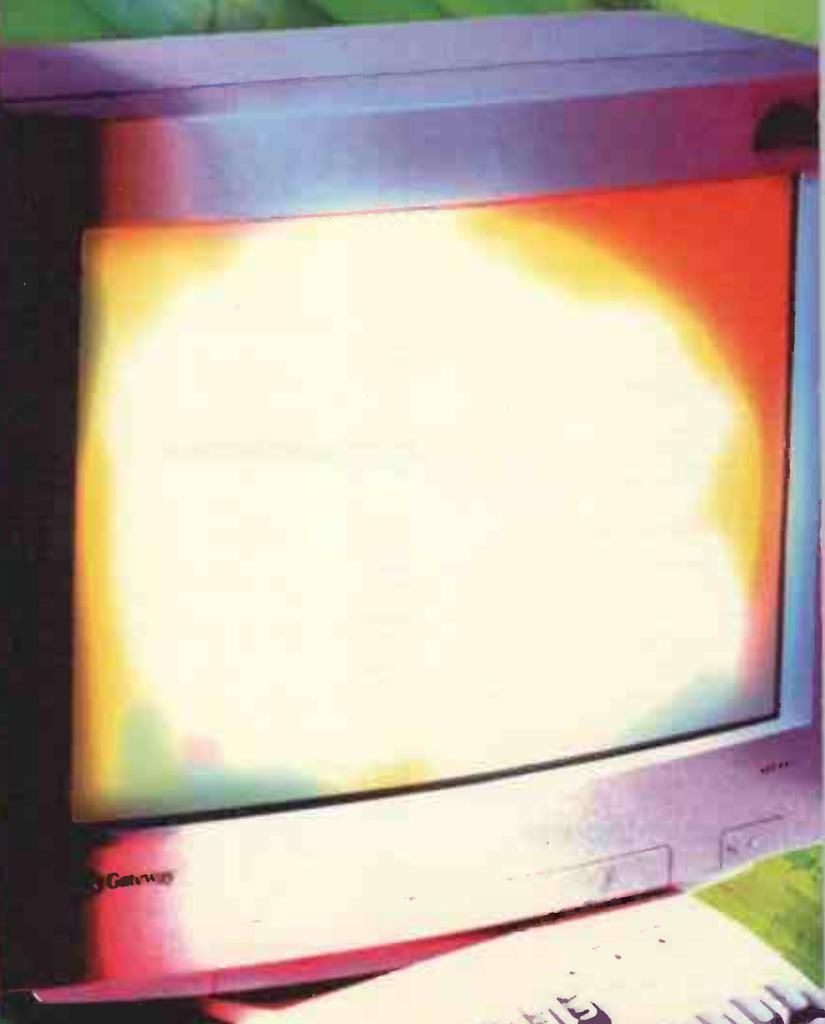
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**P**C 'obsolescence' is always a worry. If you don't buy the latest and fastest PC now, will it still be able to run the new applications which are just around the corner? With the arrival of the Pentium III [reviewed in full on p122] and the imminent revolution in the processor market, what to buy is a vexed decision. Here, we are looking at small-business machines for a modest £999 (exVAT) but all had to be capable of being upgraded to prolong their lives as long as possible.

**There was an almost equal split** between vendors who opted for the newest versions of the Celeron and those who went for the Pentium II. None opted for the current Socket 7 processors such as the AMD K6-2 and the Cyrix MII, as Socket 7 technology is coming to the end of its life and so would not make a good choice for a machine that will be upgraded in future. The Pentium II may also be a relatively old processor but it is a tried and tested, well-supported technology, and if you have the right motherboard you will be able to upgrade. Even the latest Celerons, with performance fast approaching that of equally clocked Pentium IIs, are well placed for expansion. We were also looking for good, core components that would be useful to businesses; some kind of removable storage device, for instance.

All other specifications were left to the vendors' choice, letting them

interpret end-users' requirements, and as you'll see, this resulted in some interesting configurations.

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♦ *Tested and reviewed by Ian Robson*

## Ratings

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

Illustration by Wendy Latham

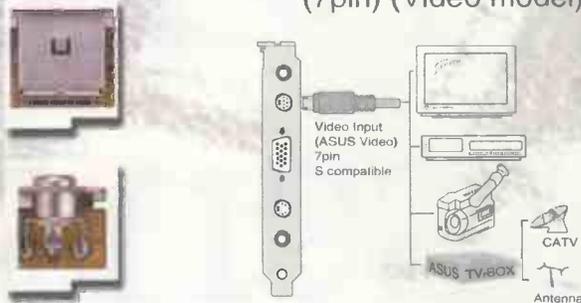
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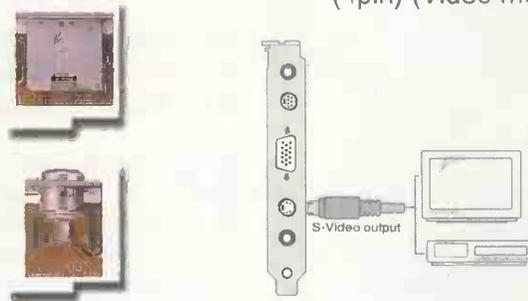
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- ★ From the hardware-features point of view, the ASUS V3400TNT/TV is the clear winner. It's the only card that provides a video input and it comes with the best cooling device of all cards.
- ★ The AGP-V3400TNT/TV is the only card that can display on the TV as well as on the computer monitor at the same time. You can even adjust a high refresh rate for the monitor, leaving the TV picture untouched.
- ★ The AGP-V3400TNT/TV is the only one comes with video output as well as video-in both either as composite or as S-VHS signal. The video input is unique amongst the test and it can prove pretty useful for things like video conferencing or taking snapshots...
- ★ The best boards for overclocking are clearly the ASUS - chip clock up to 120MHz and memory clock up to 125MHz
- ★ The temperature test showed that the V3400TNT is the by far coolest card in the test, which is most likely the reason why it is also the one card that could be overclocked higher than any other.
- ★ The only TNT cards that I would buy are the ASUS V3400TNT or even better the ASUS V3400TNT/TV....



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ASUS Multimedia

# Upgrade paths

**W**ith better and faster components constantly just around the corner, the purchase of a PC is a commitment to what's on offer at the time of purchase. Or will upgrading prolong the life of your PC? At the same time, while you can specify a system with enough upgrade paths to extend its lifeline as long as possible, how many of your options are economically viable? These days vendors appreciate this consumer concern over the potential lifetime of their PC, and cater for it with what seems like

invitations to delve inside their boxes. One of the simplest and instantly effective ways to increase system performance is to add extra memory. PC100-compatible DIMMs currently cost around £1 per megabyte. These will run equally well on the slower 66MHz front-side bus of the Celeron and can be transferred to future systems using the 100MHz front-side buses of the faster PIIIs and the PIII.

**When running current software,** an upper limit of 128Mb of RAM is sufficient, but all vendors in this test had left free memory slots because realistically the amount of RAM needed to run the new crop of applications can only grow. Equally, new applications are likely to put an increasing strain on your hard disk. With full installations of software packages now reaching around 500Mb in some instances, you may find that dabbling with all that's on offer will leave you in desperate need of an increase in your storage requirements.

**Installing extra hard disks** was once accompanied by the manual configuration of CMOS settings, and in some instances special software was required to overcome inherent limitations in the capacities of the additional storage devices.

In all the machines supplied for this group test the configuration setup utility will auto-detect most EIDE devices including hard disks, and addressing disks larger than 8.4Gb is no longer an issue. Of course, installation of a new storage device requires the

availability of a bay, and although Siemens cut the choice down to just the one, this is probably the most essential device upgrade you'll need in the lifetime of your system.

**SCSI storage devices** are another option to consider but these will require both a free bay and a spare slot for the SCSI controller card. Some of the machines on test here would be hard pushed to provide this. In the past, the rate of data transfer of

## You may feel the need for a DVD-ROM drive

SCSI media devices was the main reason to go for this more expensive technology, but current EIDE transfer rates are comparable and certainly the cost ratios support the use of the latter devices in these £999 systems.

More substantial performance gains can be achieved by replacing either the graphics card, in some instances, or the processor. Graphics cards can have their instructions bottlenecked by modest CPUs so if you are thinking of splashing out on the latest and greatest graphics card, consider whether your processor is up to supporting it. You may end up spending more but it may prove more rewarding. And, with CPU jumper settings such as front-side bus speeds and multipliers now available through CMOS, this is becoming an attractive area for upgrading.

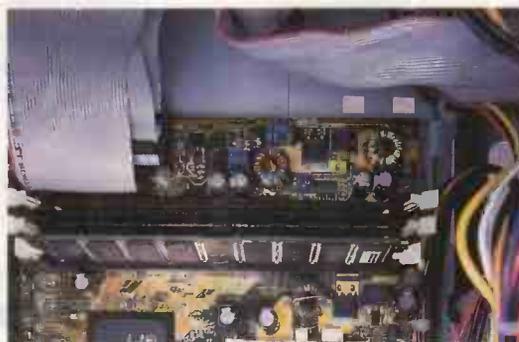
**All the systems** supplied to us for this group test came with BX motherboards and so will support upgrades to Intel's

450MHz PII and to the Pentium III 450 and 500. In the case of vendors who supplied 350MHz CPUs you will see dramatic performance gains. Although the Celeron is championed as a budget CPU it currently suffers from having its front-side bus speed restrained to 66MHz. There is speculation that the faster Celerons planned for the last quarter of this year will offer support for a 100MHz front-side bus. It's not clear whether the motherboards supplied with the systems in this group test will need a BIOS flash upgrade or full replacement to support these chips, but hopefully neither will be needed.

**For the small home office** environment you may feel the need for a DVD-ROM drive. DVD is currently regarded as a home entertainment medium but will eventually be used for all software distribution thanks to its massive storage capacity and support for older CD-ROMs. NEC was an early adopter and chose to include a DVD, and all the other vendors have left at least one 5.25in bay free, although the Siemens system will need some internal repositioning.

These are just some of the essential upgrade paths open to you, and with free bus slots in most systems there is certainly room for more.

▶ **MAKE SURE YOU HAVE SPACE IN THE CASE TO ALLOW FOR NEW DRIVES**  
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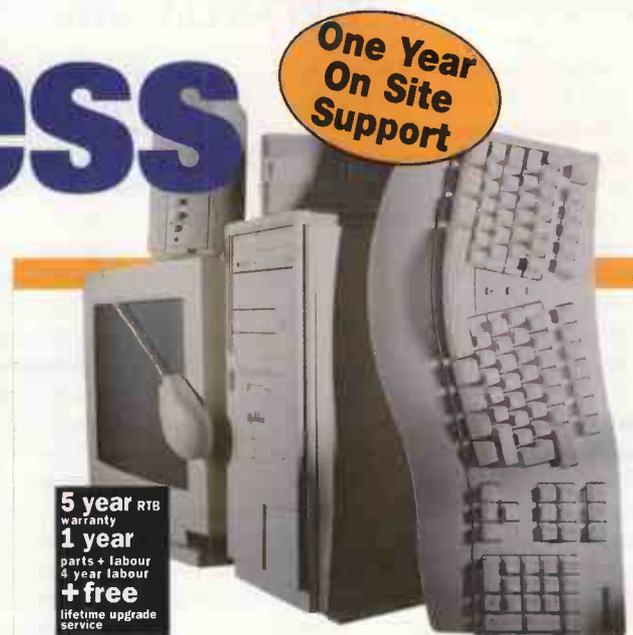


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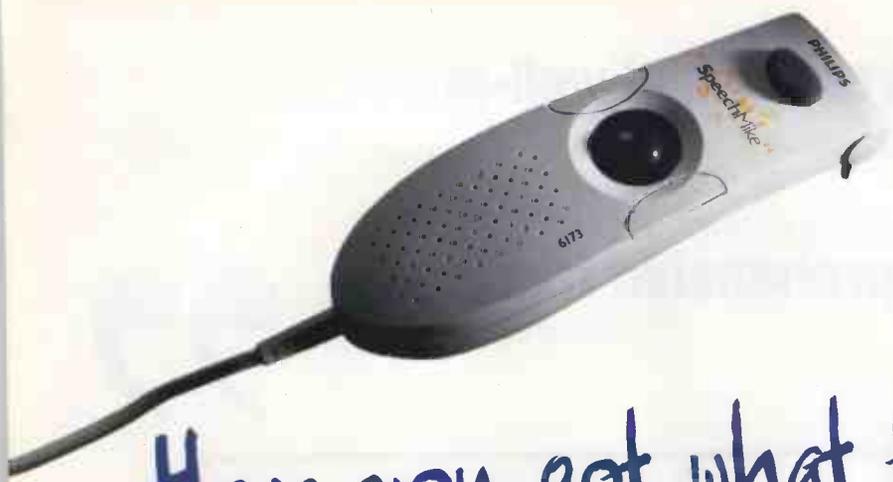
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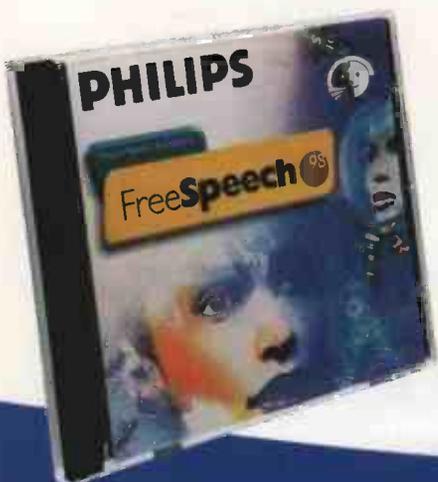
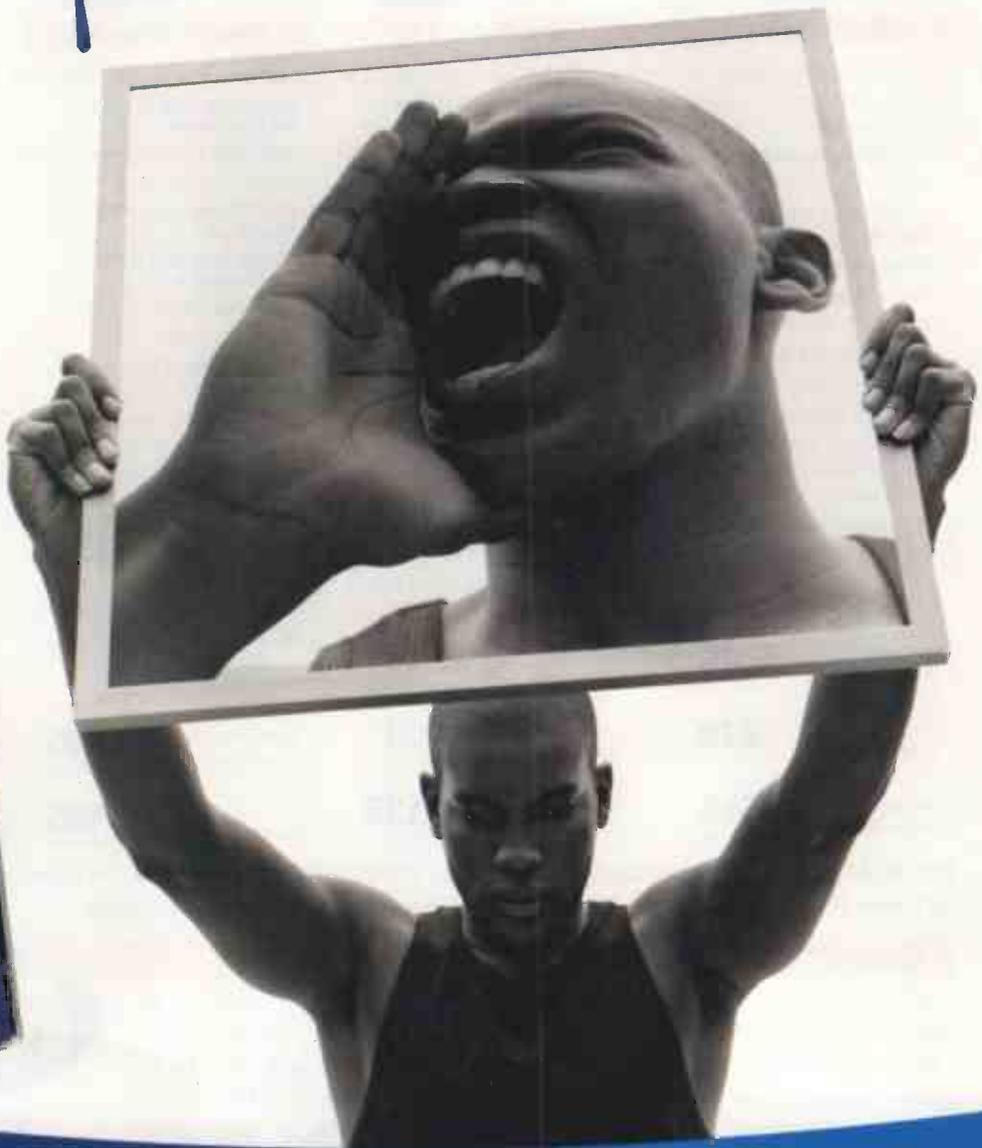
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# The Celeron 400MHz: what's new?

In January, Intel extended its popular Celeron processor range to include 366MHz and 400MHz versions, with the latter proving a popular choice for the machines in this group test.

With its Level 2 cache — a modest 128Kb — all the attention is placed on the cache's core speed, which is the same as the processor's. In some instances this can lead to processing power comparable to that of Pentium IIs with the equivalent clock speed.

Even though on the PII the Level 2 cache is a much larger 512Kb, it runs at half the CPU frequency. But it must be pointed out that the Celeron's front-side bus speed is still constrained to 66MHz whereas the Pentium II enjoys a full bandwidth of 100MHz — some might say in an attempt to bridge the gap in those comparable performance results.

Intel has stated that to maintain Celeron as a budget option, this constraint will remain at least until the company can assess the future of the Pentium II.

The complete range of Celeron processors is provided in the single-edge

processor package (SEPP) also known as Slot1, while 400, 366, 333 and 300A megahertz processors also come in a plastic pin grid array (PPGA) form factor. PPGA is compatible with the new Socket 370, which looks like Socket 7 but with an extra row of pins. Socket 370 is proprietary and SuperSocket 7 chips such as AMD's K6-2 are not pin compatible. You will notice from our features table [pp172/173] that in the case of a vendor opting for the Celeron, the technology for motherboard connectivity has been specified.

In this group test, all the vendors opted for Slot1 as it is more readily upgradeable. The SEPP packaging technology is very similar to the Pentium



II's single edge contact (SEC) cartridge.

However, without the PII's BSRAM (Burst Static RAM) componentry, it is much cheaper to produce. It has no thermal plate or cover, although Intel claims the 0.25 micron manufacturing process reduces processor heat so that the Celeron can use a smaller heat sink.

▲ THE PPGA VERSION OF THE INTEL CELERON PROCESSOR

## A QUESTION OF CACHE

Cache size is now often quoted in specifications, but what is it, and how much of it do you need?

The system's processor must have data made available to it at high speed, otherwise it will be waiting around before it can complete its instructions. To achieve maximum efficiency there should be no queue of data transfers into and out of the CPU. As the speed of CPUs has increased, the demands on memory to supply at increasingly faster rates has forced up cache speeds to bridge any data vacuum.

The primary, or Level 1 cache, is the fastest available data resource for the CPU. It can achieve these rates of data transfer because it is built onto the processor die

itself, synchronously running at the same clock frequency with no wait-states, or delays, in supplying its contents.

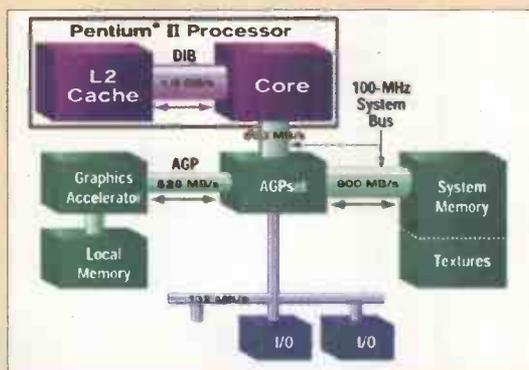
The information contained in cache is dictated by the instructions previously completed, and this data may not always be what is needed next. For this reason the processor has the ability to look beyond this data at the secondary, or Level 2, cache in the hope that the larger capacity may contain something more useful.

There are several methods of implementing Level 2 cache. It may be placed 'off-die' with clock speeds half that of the host processor, as in the PII, but improvements in manufacturing techniques have offered the chance to squeeze large amounts onto the die with clock speeds

equal to that of the CPU. However, two clock cycles can pass as wait-states while the cache is configured for the first retrieval of data, and only the subsequent retrievals will be completed at the actual CPU clock frequency.

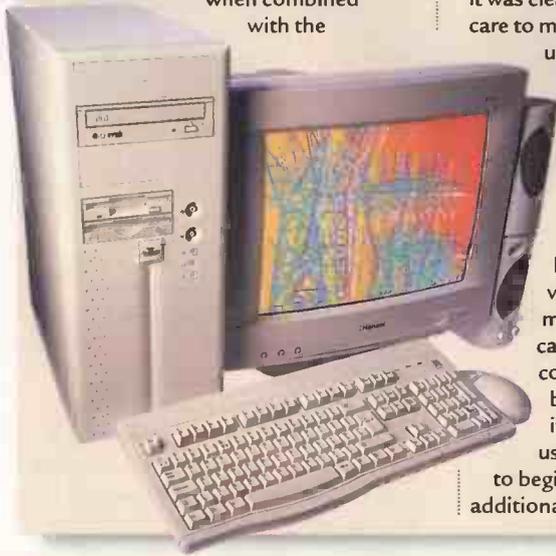
At present, the cheapest method of Level 2 cache implementation is to place it on the motherboard, with sizes ranging from 256Kb to 2Mb, although performance gains between 512Kb and 1Mb may be as low as three percent for some applications. With the on-die 128Kb of the later Celerons

producing results that give the PII a run for its money, the indication is that this is the way forward. As almost all processors are now manufactured using 0.25 micron technology and with even smaller designs imminent, you can expect to see more Level 2 cache being squeezed onto the processor die, performance increases and falling prices.



## Actinet Office 2000

Along with MAA IT and Siemens [pp164/166] Actinet provided a PII 350MHz — a slower-clocked processor than the others here — but made up for it by offering just a little bit extra in other areas. The 128Mb system memory runs on the 100MHz front-side bus but this wasn't enough to raise the poor performance scores produced by the processor, even when combined with the



excellent Viper550 video card with its massive 16Mb of video memory. Still, 10.2Gb of EIDE hard disk is generous and combined with an Iomega Zip 100 drive with its 100Mb removable disks, storage is fairly covered for now. Future data transfer devices can be added in the free 3.5in and 5.25in bays. Having loosened a couple of screws it was clear that Actinet has taken care to make future servicing and upgrading trouble free.

Cables are clipped in tidily and Actinet has positioned them sensibly, leaving a long enough length of cable for future components to be easily added. There was enough budget left to include PCI versions of both a 56K modem and an Ethernet card. Although the latter was constrained to just a 10Mbps bandwidth, this should suit its intended small-office usage. And, with five PCI slots to begin with, there's still room for additional cards when required.

Actinet rounded off this package with a quality 17in display from Hansol Electronics. Its pin-sharp image manages to extend to all four corners of the screen without lacking in brightness or colour. With a resolution of 1024 x 768 at 85Hz, it is comfortable to work with for long periods.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Actinet 01952 270703

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

**Good Points** Generous hard-disk storage. Quality display.

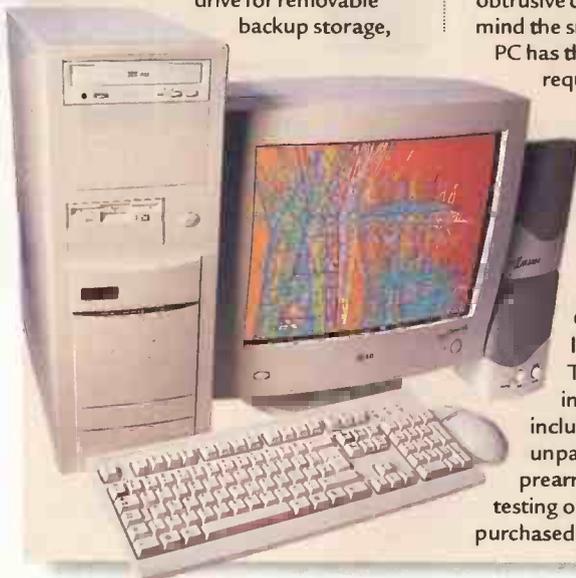
**Bad Points** Slow processor.

**Conclusion** Compromised by its processor.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★

## Carrera Charisma

Carrera provided a tall, plain functional case with enough space to allow a number of additional drives in future. Everywhere you look, Carrera has left space for future upgrading. All 128Mb of system memory is on a single module, leaving room for two more. Where others have opted for an extra drive for removable backup storage,



Carrera has saved on a bay by providing an LS-120 drive which also reads and writes to 1.44Mb floppies. If the 9.1Gb hard disk proves too restrictive, there are two 3.5in bays above the EIDE channels. The height of the case and the extra space within means access to the components is unrestricted and there are no obtrusive cables. Carrera has kept in mind the small-business user so this PC has the basic components required for a generic office machine, such as an Ethernet card, and has not wasted money on over-the-top multimedia yet still allows the end-user scope to upgrade.

Carrera offers three levels of service module. This system comes with the initial, bronze, option which includes the delivery and unpacking of your system on a prearranged day and on-site testing of additional hardware purchased with the system.

A 17in LG Studioworks monitor displays a reasonable image at 1024 x 768. It is bright, and even to its extremities, but only just holds a decent refresh of 75Hz. The OSD is a little tricky to negotiate but provides all requisite functions with highly responsive graphical meters for total control.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Carrera 0181 307 2800

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

**Good Points** Powerful processor with decent memory support.

**Bad Points** Not the best monitor on offer here.

**Conclusion** A good package, suitable for most users.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★



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Mobile Pentium 266MHz	£949.00	£1115.08

Dimensions: 280mm  
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Weight: 1.6Kg (3.5lbs)

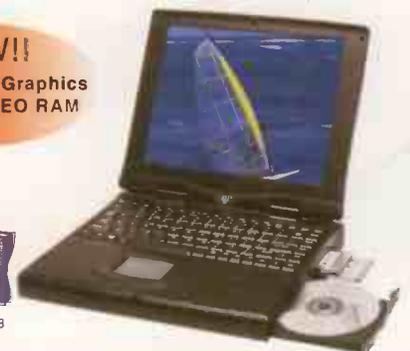
## AJP 1100P Specification

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Built-in AGP Graphics  
4MB SG VIDEO RAM



32MB SDRAM, 3.2GB HDD Windows 98	12.1" TFT Active		13.3" TFT Active		14.1" TFT Active	
	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT
PII 266 MHz MMC-2 AGP	£1025.00	£1204.38	£1099.00	£1291.33	£1175.00	£1380.63
PII 300 MHz MMC-2 AGP	£1125.00	£1321.88	£1199.00	£1408.83	£1275.00	£1498.13
PII 333 MHz MMC-2 AGP	£1249.00	£1467.58	£1325.00	£1556.88	£1399.00	£1643.83
PII 366 MHz MMC-2 AGP	£1375.00	£1615.63	£1449.00	£1702.58	£1525.00	£1791.88

## AJP 2100P Specification

- 14.1" / 13.3" TFT Active LCD XGA 1024x768 resolution
- Intel Mobile Pentium II processor MMC-2 266/300/333/366MHz with AGP Graphics
- Intel 440BX Chipset on motherboard
- 8MB SG Video RAM, ATI Rage LT PRO High performance AGP 2x Video adapter
- 64MB SDRAM upgradeable to 384MB
- 4GB HDD upgradeable to 10GB. Supports Ultra DMA, ATA-33
- 512KB secondary cache pipeline burst synchronous RAM
- 24 Speed CD ROM Drive supplied as standard interchangeable with optional DVD Drive, 3rd HDD
- User removable 3.5" 1.44MB FDD supplied as standard, interchangeable with optional, LS-120 Drive, 2nd Battery, 2nd Hard Disk Drive
- 1 x Type III and 1 x Type II PCMCIA slots. Supports ZV card
- 3-D sound, 16 bit stereo, full duplex sound card, stereo speakers, microphone
- Ports: 2 Universal Serial Bus (USB), Video-In (Video Capture), Video-Out (TV Output), Serial, Parallel, Monitor, Port Replicator, PS/2 Mouse and Keyboard, Game Port, 2x IrDA
- IEEE 1394 Firewire 400Mbps (for connecting digital camera/video camera)
- Li-Ion battery delivers approximately 2hrs continuous use
- Windows 98 supplied as standard preloaded with CD's and manual (or Windows 95)
- Software MPEG supplied as standard. Optional Software MPEG II available
- Dimensions: 316mm (W) x 256mm (D) x 47mm (H) Weight: 3.3Kg

13.3" TFT, 4GB HDD, 64MB RAM  
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Windows 98 - 266MHz  
**Power User**  
PII - 266MHz

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Built-in AGP Graphics  
8MB SG VIDEO RAM  
IEEE 1394 FIREWIRE



64MB SDRAM, 4GB HDD Windows 98	13.3" TFT Active		14.1" TFT Active	
	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT
PII 266 MHz MMC-2 AGP	£1249.00	£1467.58	£1325.00	£1556.88
PII 300 MHz MMC-2 AGP	£1349.00	£1585.08	£1425.00	£1674.38
PII 333 MHz MMC-2 AGP	£1475.00	£1733.13	£1549.00	£1820.08
PII 366 MHz MMC-2 AGP	£1599.00	£1878.83	£1675.00	£1968.13

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Upgrade from 3.2GB to 4GB HDD	20.00	23.50
Upgrade from 3.2GB to 5GB HDD	56.00	65.80
Upgrade from 4 GB to 6.4GB HDD	60.00	70.50
Additional 3.2GB HDD	119.00	139.83
Additional 4GB HDD	139.00	163.33
Additional 5GB HDD	175.00	205.63
Additional 6.4GB HDD	199.00	233.83
HDD Housing Kit	39.00	45.83
Upgrade from NiMH to Li-Ion Battery	49.00	57.58
Battery Charger	125.00	146.88
1100 Additional Li-Ion Battery	99.00	116.33
8500 Additional Li-Ion Battery	125.00	146.88
980 External CD ROM Drive with PCMCIA Connector	99.00	116.33

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PCMCIA Ethernet Card 10/100 Mbps (10BT)	99.00	116.33
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PCMCIA Fax/Modem (GSM/ PSTN)	239.00	280.83
PCMCIA Combo Fax 56K/Ethernet 10Mbps	125.00	146.88
PCMCIA Combo Fax 56K/Ethernet 10/100Mbps	149.00	175.08
PCMCIA MPEG II Card	149.00	175.08
MPEG II Hardware	99.00	116.33
MPEG II Software	49.00	57.58
Car Adapter	45.00	52.88
Imega Zip Drive (100MB)	175.00	205.63
LS-120 Drive (120MB)	125.00	146.88
DVD Drive	199.00	233.83
Port Replicator	99.00	116.33

# OF THE YEAR 1999

PC ADVISOR MAGAZINE - FEB 99



## AJP 8500P/8500PD Specification

- Intel Mobile Pentium II processor MMC-2 266/300/333/366MHz with AGP Graphics
- 8500P supplied with 24 speed CD ROM drive and floppy disk drive
- 8500PD supplied with DVD Drive, software MPEG II and LS-120 Drive
- AGP 2x Graphics Chipset
- Intel 440BX Motherboard Chipset
- 64MB SDRAM upgradeable to 384MB
- 512KB secondary cache pipeline burst synchronous RAM
- Full PC 97 and ACPI v.1.0 compliant
- Windows 98 supplied as standard preloaded with CD's and manual, (or Windows 95)
- 16-bit stereo, full duplex sound card with 1MB MASK ROM hardware wavetable, 3-D stereo sound, ESFM music synthesiser, built-in high power speakers and microphone.
  - Infra red wireless communication port. IrDA 1.1, FIR, ASKIR compliant
- 8500P User removable 24 speed CD ROM drive supplied as standard, interchangeable with optional DVD Drive
- 8500PD User removable DVD Drive with software MPEG II supplied as standard, interchangeable with optional CD ROM Drive
- Software MPEG supplied as standard. Supports optional MPEG II software and hardware accelerator card
- Ergonomically designed wrist rest with two button track pad



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PII - 266MHz

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DISPLAY

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- Ports: IEEE 1394 Firewire 400Mbps (for connecting digital camera/video camera), 2 x Universal Serial Bus (USB), Video In (video capture), Video Out (high definition TV output), Serial, parallel, Monitor, 2 x PS/2 Keyboard & Mouse, Port Replicator



- PCMCIA Type III slot allows use of up to two Type II PCMCIA Cards or one Type III. Supports Zoomed Video port

- 8500P: User removable floppy disk drive, supplied as standard interchangeable with optional 2nd Hard Disk Drive, iomega Zip Drive, LS-120 Drive.



• 2.5" Hard Disk Drive • iomega Zip 100MB Drive • LS-120 20MB Drive

Size: 357mm (W) x 275mm (D) x 50 (H). Weight: 4.6Kg

- 101/102 Enhanced full size Windows 95 keyboard with separate numeric keypad
- Li-Ion battery delivers approx. 2.5 hours continuous use

64MB SD RAM, 4GB HDD WINDOWS 98	AJP 8500P		AJP 8500PD	
	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT
PII 266 MHz MMC-2 AGP	£1499.00	£11761.33	£1725.00	£2026.88
PII 300 MHz MMC-2 AGP	£1599.00	£1878.83	£1825.00	£2144.38
PII 333 MHz MMC-2 AGP	£1725.00	£2026.88	£1949.00	£2290.08
PII 366 MHz MMC-2 AGP	£1849.00	£2172.58	£2075.00	£2438.13

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IEEE 1394 FIREWIRE

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- Supports Master Mode EIDE, ATA-33, Ultra DMA/33

- 8500PD: User removable LS-120 Drive supplied as standard interchangeable with optional 2nd Hard Disk Drive, iomega Zip Drive, Floppy Disk Drive.

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Resolution SVGA	800x600
Light output (ANSI)	700
Weight (kg)	7.1b

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## Dan Dantum II-C400/C

The Dan was close to being given an award in this group test but was let down by its relatively low memory specification of 64Mb rather than the 128Mb provided by most of the others. Two memory module slots are vacant, and at not much more than £1/Mb, memory is too good a bargain to be stinted on.

The Celeron  
400MHz



processor produced lower benchmark scores than the PII 400s in this test, partly because the Celeron front-side bus only runs at 66MHz rather than the 100MHz speed of the PII 400s.

Storage is not a problem on this PC. There is an LS-120 for removable media and an 8.4Gb hard disk accessed via the EIDE channel. It should be easy to add devices in future as there is good access to the spare 3.5in and 5.25in bays. We didn't ask vendors to supply a network card or a modem but those who did mostly opted for PCI versions, taking advantage of the faster bus speeds. Dan opted for a 56K modem running on the slower ISA bus. Inside, internal cooling seems to have been a prime consideration. There is a front-mounted full-size fan in addition to the CPU's own mini fan,

and various heat sinks scattered about on main chips.

Dan supplied a re-branded CTX 17in monitor with responsive front-mounted buttons. The screen image was acceptable at 1024 x 768 at 85Hz, but when working at higher resolutions the refresh rate drops to 60Hz.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Dan Technology  
0181 830 1100 [www.dan.co.uk](http://www.dan.co.uk)

**Good Points** Good internal construction. Latest processor.

**Bad Points** Reduced system memory.

**Conclusion** Attention placed equally well to all areas except memory.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★

## Evesham EveshamVale Platinum

Evesham constructed a sturdy tower around a Celeron 400MHz, with 128Mb of system memory on just one module, leaving three vacant slots to fill with more RAM. Three spare slots should allow you to increase the RAM over time. A 10Gb EIDE hard disk is supplied as permanent storage with an omega 100Mb Zip



drive for removable media, although it does take up one 5.25in device bay, leaving only one for additional devices. PC99, the industry specification for development in 1999, dictates that support for the slower ISA bus is no longer required. It's a shame, because this system has room for three ISA cards, including the slot shared with a

spare PCI. It allows you room to add legacy ISA cards, though. Evesham opted for faster PCI versions for its 56K modem and 10/100Mbit Ethernet card. The small office seems to have been catered for but in future you may need to squeeze in a few extra components. Inside the system, individually wrapped groups of cables are clipped tidily,



with just the right length of cable left free on spare connectors.

A TCO99 version of Taxan's 17in Ergovision 735 has been chosen as the monitor for this system, and is a wise choice. An OSD provides responsive control over a clean, bright image, fully focused at a resolution of 1024 x 768 at 85Hz.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Evesham 0800 496 0800  
[www.evesham.com](http://www.evesham.com)

**Good Points** Latest high-speed processor. Generous storage.

**Bad Points** Zip drive placed in a wrong-sized bay.

**Conclusion** Excellent system, still open to upgrade options.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★

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CPU	333	366	400
Model	MMX	MMX	MMX
Price	£550	£575	£595
Incl VAT	£550	£575	£595
(Ex VAT)	(£468.09)	(£489.36)	(£506.38)

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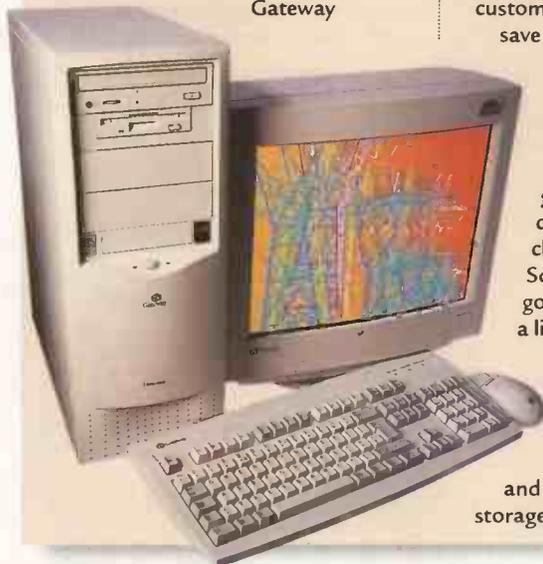
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## Gateway GP6-400

Gateway has provided inspired machines in the past, but this latest was a little disappointing. Supplying a system with a PII 400MHz processor seems to have significantly reduced the amount of money available for other components. While most other vendors in this test opted for 128Mb of RAM, Gateway



provided only 64Mb of system memory on a single module, leaving just one module free to increase the memory quota. The 6.4Gb hard disk will very quickly fill with applications. Even if you only use an application occasionally to read the odd document, it is far easier to keep it on the hard disk rather than messing around uninstalling or customising initial installations to save on space. A removable storage device could have eased this problem but even this had been left out. There is no modem and no network card; even the graphics has been constrained to an on-board chip, as has the sound. So where has all the money gone? Well, Gateway has spent a little extra on a fan and duct system for the CPU but this will be of little comfort to whoever buys this system. There is room for devices on the four vacant PCI slots and you could combat the storage problems yourself by

adding devices into the ample bays available. Nevertheless, Gateway has provided perhaps the best 17in monitor in this test. Its pin sharp display and extremely high refresh rate of 100Hz at 1,024 x 768 is complemented by quality colour registration and an even brightness, right up to the bezels.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Gateway 0800 552000, [www.gateway.com/uk](http://www.gateway.com/uk)

**Good Points** Excellent monitor. Very upgradeable system.

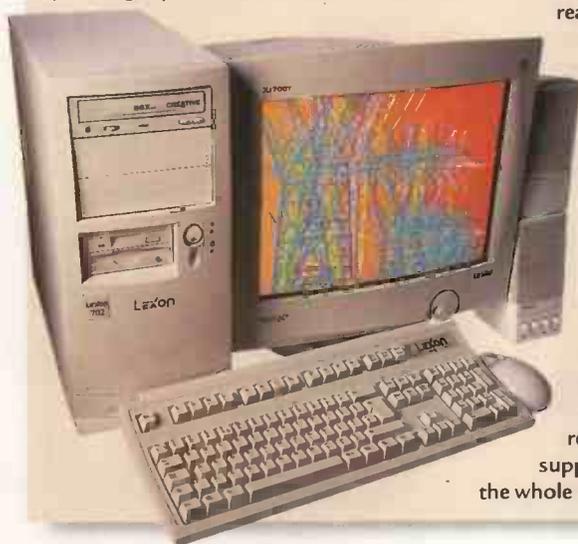
**Bad Points** Stunted memory and storage.

**Conclusion** A poor balance of components.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★
<b>Overall Rating</b>	★★★

## Lexon Maxima 702EL

Lexon, like others in this test, opted for Intel's PII 400MHz but it has not stinted on other components to get within our price bracket, especially considering the 56K PCI modem and 10/100Mbit PCI Ethernet card provided. With the addition of a hub, the Maxima could feasibly serve the web to others in a workgroup. The future-proofing aspects of this PC are not



overwhelming. There is room for only one more PCI card and there are only 5.25in bays available for extra hard disks or other devices. The option to replace components is yours, though, and this applies equally to the CPU, which can be notched up to the currently available 450MHz PII or even a PIII.

**For the keen tinkerer**, this model really invites you inside. With the loosening of just one screw you can appreciate the care taken in the construction of this machine. Individually wrapped cables are clipped back and easy access is provided to all components of vital importance. However, it's quite a let-down when you realise that replacing the CPU would mean temporarily removing the power supply or levering out the whole motherboard.

A 17in Mag Innovision monitor is provided with a marvellous dial control for sweeping around the OSD using only one finger. But apart from this, working in or above a resolution of 1024 x 768 is quite a strain on the eyes and there is a mild bloom to the characters, creating overall fuzziness on an otherwise bright, colourful display.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Lexon Technology 0181 667 1173 [www.lexonpc.com](http://www.lexonpc.com)

**Good Points** Excellent performance.

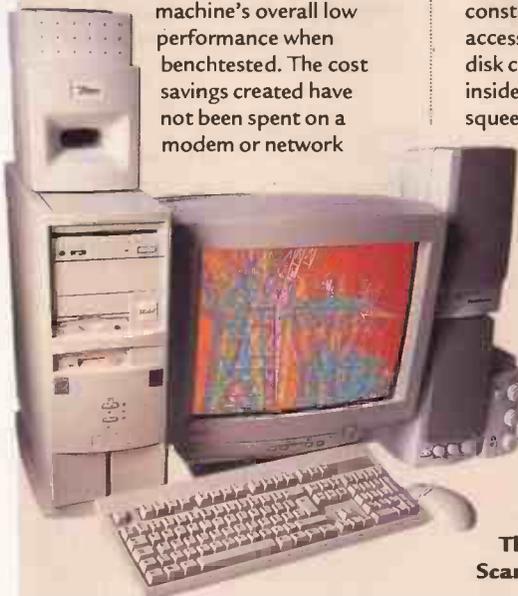
**Bad Points** Constrained maintenance options. Poor display quality.

**Conclusion** Efforts to provide speed have left other areas unattended.

<b>Build Quality</b>	★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★

## MAA IT Rim 6350P

**Best known** for its servers, MAA IT submitted a rather modest system. It generously supplied a full memory quota of 128Mb running on the full 100MHz front-side bus. However, it cut back on processor power with Intel's PII 350MHz which contributed to the machine's overall low performance when benchtested. The cost savings created have not been spent on a modem or network



card but there are enough spare slots to fit both PCI or ISA versions later, depending on the end-user's requirements. Housed in a good-quality case is a generous 10.2Gb EIDE hard disk complemented by Iomega's popular Zip 100 for backup. Adding further devices is constrained to one 5.25in front-accessed bay, although the hard disk could be re-mounted on the inside front of the system to squeeze in another front-facing 3.5in device. Twisting off the one thumbscrew allows access to the inside of the machine via a side panel. Future upgrading will be made easier by the way this PC has been built. There is clear access to all the internal components and the cables have been tidily clipped out of the way, although they have not been shortened so you will not have to add new cables when you upgrade.

**The Mitsubishi Diamond Scan 17in** is an excellent choice of

monitor although a little extravagant, to the detriment of other system components. The image remains rock solid up to 1024 x 768 but the refresh will suffer above that. A colourful subset OSD menu has directories to allow control over all requisite parameters, with good response and levels indicated graphically.

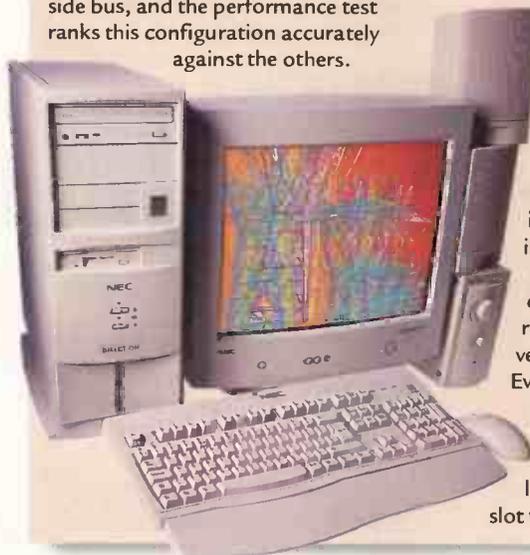
### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** MAA IT 0870 606 9696 or 0171 646 2000 [www.mait.co.uk](http://www.mait.co.uk)  
**Good Points** Generous storage. Clear upgrade paths.  
**Bad Points** Slow processor.  
**Conclusion** Slow performer but good construction.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★

## NEC Direct Direction SM 400B

**NEC opted** for a large mini-tower which afforded masses of inner airflow and lots of room for upgrading. The PII 400MHz was the choice of almost half the vendors in this group test yet few seemed to offer a complete supporting package. Likewise, only 64Mb of system memory is on offer from NEC, albeit on the 100MHz front-side bus, and the performance test ranks this configuration accurately against the others.



But there are compensations. This was the only system to be supplied with a third-generation DVD with 4X DVD reading and 24X for basic CD-ROMs. A DVD, although not strictly necessary in a small office, does provide support for reference and other non-entertainment-based DVD titles in future. Storage is a capable 8.4Gb EIDE hard disk but this is not backed up by a removable media device, imperative for backing up data in small offices without network backup.

**One twist** of the thumbscrew removes a side panel for instant access to the system's inner sanctum, wherein lies NEC's forté. A wealth of construction experience has resulted in an 'open-plan' version of the inside of a PC. Everything is accessible and cables are at the ready for additional devices. A 56K PCI version of a modem leaves two PCI and one ISA slot for additional cards.

**NEC's own-brand 17in monitor** is smooth and classy. Its sleekly curved exterior houses a bright, sharp CRT image that won't let you down at a resolution of 1024 x 768 at 85Hz. The OSD pops up as an array of icons, but with a graphical level meter you soon grasp the responsive controls by the horns.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** NEC Direct 0870 010 6324 [www.necdirect-europe.com](http://www.necdirect-europe.com)  
**Good Points** Quality construction. Good display.  
**Bad Points** Poor memory quota. No removable media.  
**Conclusion** Attention has been paid to construction but not to detail.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★

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PC Magazine was looking at systems, for people wishing to invest for the first time. The Hi-Grade PV2 had the best balance of performance, latest technology, quality components and the right price tag and was awarded "Editor's Choice". This system has won the PC Advisor "Recommended" award twice, and has twice been called a "model of reliability" by PCW. The PV3 450 is now powered by the Intel® Pentium® III processor 450MHz.

NEW PRODUCT	NEW PRODUCT
HI-GRADE NOTINO	HI-GRADE NOTINO
AS7200-266A	AS7200-300A

Mobile Intel® Celeron™ processor 266MHz  
Intel® mobile module specification (MMC)

Mobile Intel® Celeron™ processor 300MHz  
Intel® mobile module specification (MMC)

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**25%**  
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AFTER 2YRS  
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128K cache on-die  
Intel® 440TX AGPset  
32Mb SDRAM exp. 160Mb  
3.2Gb removable hard disk  
12.1" TFT SVGA colour LCD

SMI 910 Graphics Accelerator with 2Mb video RAM, supports LCD and dual-view for external display  
24x speed CD-ROM drive

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Intel® 440TX AGPset  
64Mb SDRAM exp. 160Mb  
4Gb removable hard disk  
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SMI 910 Graphics Accelerator with 2Mb video RAM, supports LCD and dual-view for external display  
24x speed CD-ROM drive  
World 56K data/fax modem

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HI-GRADE ULTIS	HI-GRADE ULTIS
NEW SPEC PV2 400	NEW SPEC PV3 450

Intel® Pentium® II processor 400MHz upgradable to 450MHz

Intel® Pentium® III processor 450MHz

512K pipeline burst cache  
Intel® 440BX AGPset  
64Mb SDRAM, exp. to 384Mb  
6Gb EIDE Ultra DMA/33 Hard Disk Drive  
Optional upgrade to 8Gb extra £20 + VAT

512K pipeline burst cache  
Intel® 440BX AGPset  
128Mb SDRAM, exp. to 384Mb  
10Gb EIDE Ultra DMA/33  
7200rpm Hard Disk Drive

V3400 Riva TNT AGP graphics card with 16Mb SGRAM

V3400 Riva TNT AGP graphics card with 16Mb SGRAM

32x speed IDE CD-ROM drive

32x speed IDE CD-ROM drive

64-bit 3D sound PCI card

64-bit 3D sound PCI card

120Mb 3.5" Super Floppy Disk drive (supports 1.44Mb)

120Mb 3.5" Super Floppy Disk drive (supports 1.44Mb)

15" Colour SVGA monitor with built-in speakers

17" Colour SVGA monitor with built-in speakers

SMC Etherpower 10/100Base-T PCI Ethernet card

SMC Etherpower 10/100Base-T PCI Ethernet card

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### Standard Notino AS7200 features

### Standard Ultis features

Li-ion 48Wh smart battery (3 - 3.5hrs) • touchpad • two PC-cards slots (supports zoom video mode) • desktop-like 19mm full-size 86-key keyboard • built-in 16-bit stereo sound with 3D sound effects • built-in speakers and microphone • ports: fast serial, enhanced parallel, PS/2 keyboard/mouse with Y-cable, infrared port (4Mbps), headphone/speaker out, mic-in, line-in, line-out, VGA for external monitor, USB • full feature SMI power management, stand-by, suspend-to-disk and suspend-to- RAM • dimensions: 294mm x 232mm x 38mm, weight: 6.1lbs/2.65kg • Windows® 95/98 (optional NT) • Lotus SmartSuite Millennium • IBM ViaVoice 98 Office edition with headset • Norton Antivirus and CrashGuard • leather carry case • 1 year return to case warranty for labour and parts.

LANdesk Client Manager software and integrated smart hardware monitoring • 1 enhanced parallel port • 2 16550 UART serial ports • 2 x USB ports • 105-key keyboard • 2 button PS/2 mouse • Windows 95/98 • Lotus SmartSuite 97 • Norton Anti-Virus & Anti-Crash software • IBM ViaVoice with headset/microphone • 1 year on-site warranty for labour and parts  
Multimedia option: 56K V90 PCI data/fax modem, DVD-ROM drive with software MPEGII, TV Tuner with Teletext, 36W RMS speakers with Subwoofer, Joystick, microphone, software (Network Q Rally Championship, Worldbook Encyclopaedia, Body Works v6, Captain Claw, Family Doctor, Oregon Trail, Design It 3D, Key Home Gardener, Typing Teacher, Kitchen Gourmet) instead of Ethernet and CD-ROM drive £175 + VAT.

**£940** **£1104<sup>50</sup>** **£1099** **£1291<sup>33</sup>**  
inc VAT inc VAT inc VAT inc VAT

**Buy back guarantee** applies to the period for which extended warranty is purchased (see options below), and applies when the product value is equal to or greater than the original product. The original product must be returned to Hi-Grade in working order.

#### Warranty Options

Desktops	up to 2 years	up to 3 years
On-site including parts & labour	£50	£95
Notebooks	up to 2 years	up to 3 years
Collection & return including parts & labour	£85	£160

**\*Six Months Interest Free** Typical example: Total cash price £1733.13. Deposit (10%) £173.31. One repayment of £1559.81 on the sixth month (APR 0%) or commencing from the sixth month, 36 repayments of £68.16 (APR 26.9%)

**\*\*9.9% APR** Typical example: Total cash price £1733.31. Deposit (10%) £173.31. 24 repayments of £77.76 (APR 9.9%)

**\*\*\*14.9% APR** Typical example: Total cash price £774.33. Deposit (10%) £77.43. 24 repayments of £33.48 (APR 14.9%)

**Business users** Financing and lease rental details available on request. Finance subject to status.

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**Y2K** All Hi-Grade products advertised above accommodate the rollover to the year 2000. System hardware controlling time and date functionality will remain unaffected. However, customers must ensure that the software they are running is also 2000 compliant.

**NEW** **£899** **£1056<sup>33</sup>** **NEW** **£1299** **£1526<sup>33</sup>**  
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ON  
9.9% APR  
24 MONTHS



The next generation model of Hi-Grade's award-winning 'ultimate notebook', the Notino AS7400 is guaranteed to exceed your expectations. The more powerful, lighter portable offers impressive performance with an Intel® Pentium® II processor 366MHz, and a massive 14.1" TFT display panel. With everything from a DVD drive to a 56K data/fax modem, the AS7400 is the multimedia mobile for the next millennium.

NEW PRODUCT	NEW PRODUCT
HI-GRADE NOTINO	HI-GRADE NOTINO
AS7400-300	AS7400-366
Mobile Intel® Pentium® II processor 300MHz Intel® mobile module specification (MMC2) 256K cache on-die Intel® 440BX AGPset 64Mb SDRAM exp. 288Mb 4Gb removable hard disk 14.1" TFT XGA colour LCD 3D and AGP graphics with H/W DVD MPEG-2 playback 4Mb SGRAM, supports LCD and Tri-view for external display 24x speed removable CD-ROM drive or interchangeable with others like DVD drive, second battery pack or second hard disk drive	Mobile Intel® Pentium® II processor 366MHz Intel® mobile module specification (MMC2) 256K cache on-die Intel® 440BX AGPset 96Mb SDRAM exp. 288Mb 6Gb removable hard disk 14.1" TFT XGA colour LCD 3D and AGP graphics with H/W DVD MPEG-2 playback 4Mb SGRAM, supports LCD and Tri-view for external display Removable DVD-ROM drive or interchangeable with second battery pack or second hard disk drive 56K World data/fax modem

GUARANTEED  
30%  
BUY BACK  
AFTER 2YRS  
20% after 3yrs

Standard Notino AS7400 features

Li-ion 48W smart battery (2.5 - 3hrs) • touchpad • two PC-cards slots (supports zoom video mode) • desktop-like 19mm full-size 86-key keyboard • built-in 16-bit stereo sound with 3D sound effects and 64-Voice wavetable synthesizer • built-in speakers and microphone • ports: fast serial, enhanced parallel, PS/2 keyboard/mouse with Y-cable, two lens for infrared port (4Mbps), TV out (NTSC/PAL), MIDI/Games, headphone/speaker out, mic-in, line-in, line-out, VGA for external monitor, docking for PCI Port Replicator, USB • full feature SMI power management, stand-by, suspend-to-disk and suspend-to-RAM • dimensions: 318mm x 250mm x 46.5mm, weight: 7.01lbs/3.25kg • Windows® 95/98 (optional NT) • Lotus SmartSuite Millennium • IBM Viavoice 98 Office edition with headset • Norton Antivirus and CrashGuard • leather carry case • 1 year return to base warranty for labour and parts.

£1475 £1733<sup>13</sup> £1999 £2348<sup>83</sup>  
Inc VAT Inc VAT Inc VAT



January 1998  
Hi-Grade  
PV2 233  
Hi-Grade Computers



March 1998  
Hi-Grade  
Notino AS6000-233  
Hi-Grade Computers



April 1998  
Hi-Grade  
Notino M2000  
Hi-Grade Computers



May 1998  
Hi-Grade  
Notino M3000  
Hi-Grade Computers



June 1998  
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PV2 233  
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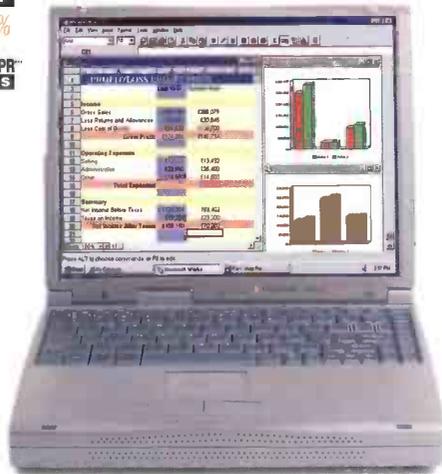
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## Compact convenience on the move

## The total multimedia experience

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OR  
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24 MONTHS



A shining example of compact convenience, the new Notino AS7300 notebook brings power, flexibility, and convenience to users on the move. This slim silver stunner is a lightweight, versatile all-in-one machine with a large 13.3" TFT LCD screen and price tag that is as attractive as its sleek silver casing. A three and a half hour battery life, Intel® Pentium® II processor 333MHz and Intel® 440BX chipset, makes the new Notino AS7300 a sparkling performer.

**14.9% APR**  
24 MONTHS



Just look at the spec. then imagine the experience! The powerful Winputer PC offers an Intel® Celeron™ processor 400MHz, a 17" colour monitor with PC-TV card, and a DVD-ROM drive which enables you to watch TV, play videos, CDs and games as well as running all your applications. A 56K data/fax modem is also provided for you to go surfing! This magnificent multimedia experience is available at an unbelievable price.

NEW PRODUCT	NEW PRODUCT
HI-GRADE NOTINO	HI-GRADE NOTINO
AS7300-266	AS7300-333
Mobile Intel® Pentium® II processor 266MHz	Mobile Intel® Pentium® II processor 333MHz
Intel® mobile module specification (MMC)	Intel® mobile module specification (MMC)
256K cache on-die	256K cache on-die
Intel® 440BX AGPset	Intel® 440BX AGPset
32Mb SDRAM exp. 160Mb	64Mb SDRAM exp. 160Mb
3.2Gb removable hard disk	4Gb removable hard disk
13.3" TFT XGA colour LCD	13.3" TFT XGA colour LCD
SMI 910 Graphics Accelerator with 4Mb video RAM, supports LCD and dual-view for external display	SMI 910 Graphics Accelerator with 4Mb video RAM, supports LCD and dual-view for external display
24x speed CD-ROM drive	24x speed CD-ROM drive
	56K World data/fax modem

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AFTER 2YRS  
20% after 3yrs

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BUY BACK  
AFTER 2YRS  
10% after 3yrs

### Standard Notino AS7300 features

Li-ion 48Wh smart battery (3 - 3.5hrs) • touchpad • two PC-cards slots (supports zoom video mode) • desktop-like 19mm full-size 86-key keyboard • built-in 16-bit stereo sound with 3D sound effects • built-in speakers and microphone • ports: fast serial, enhanced parallel, PS/2 keyboard/mouse with Ycable, infrared port (4Mbps), headphone/speaker out, mic-in, line-in, line-out, VGA for external monitor, USB • full feature SMI power management, stand-by, suspend-to-disk and suspend-to- RAM • dimensions: 294mm x 232mm x 38mm, weight: 6.1lbs/2.65kg • Windows® 95/98 (optional NT) • Lotus SmartSuite Millennium • IBM ViaVoice 98 Office edition with headset, • Norton Antivirus and CrashGuard • leather carry case • 1 year return to base warranty for labour and parts.

HI-GRADE WINPUTER	HI-GRADE WINPUTER
NEW SPEC PV2 336A	NEW SPEC PV2 400A
Intel® Celeron™ processor 366MHz with 128K cache on-die. Optional upgrade to 400MHz extra £20 + VAT	Intel® Celeron™ processor 400MHz with 128K cache on-die
Intel® 440LX AGPset	Intel® 440LX AGPset
32Mb SDRAM exp. to 256Mb	64Mb SDRAM exp. to 256Mb
6Gb EIDE Ultra DMA/33 hard disk drive	8Gb EIDE Ultra DMA/33 hard disk drive
32x speed IDE CD-ROM drive	DVD-ROM drive
Built-in ATI Rage Pro 3D AGP graphics with 8Mb RAM	Built-in ATI Rage Pro 3D AGP graphics with 8Mb RAM
15" Colour SVGA monitor with built-in speakers. Optional 17" extra £50 + VAT	17" Colour SVGA monitor with built-in speakers
56K flex data/fax modem with voice	56K flex data/fax modem with voice
	TV Tuner with teletext

### Standard Winputer features

Built-in 16-bit 3D sound • 1.44 Mb floppy disk drive • joystick and microphone • 1 enhanced parallel port • 1 16550 UART fast serial port, • 2 USB ports • 1 joystick port • 1 microphone port • line-in • line-out • 105-key keyboard • 2 button PS/2 mouse • Windows 95/98 • Norton Anti-Virus & Anti-Crash software • 1 year on-site warranty for labour and parts. Software: Lotus SmartSuite 97, Network Q Rally Championship, Worldbook Encyclopedia, Body Works v6, Azrael's Tear, Captain Claw, Family Doctor, Oregon Trail, Design It 3D, Key Home Gardener, Typing Teacher, Kitchen Gourmet.

**£1159** **£1361<sup>83</sup>** **£1499** **£1761<sup>33</sup>**  
inc VAT inc VAT inc VAT inc VAT

**£659** **£774<sup>33</sup>** **£879** **£1032<sup>83</sup>**  
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During our twelve years experience in computer manufacturing Hi-Grade have grown enormously. And products from our extensive range of top quality business and home computers consistently win prestigious awards and praise in the PC press. Our continued success **has ensured our place in the 'UK's top 100 fastest growing independent business' listing for the second year running.**

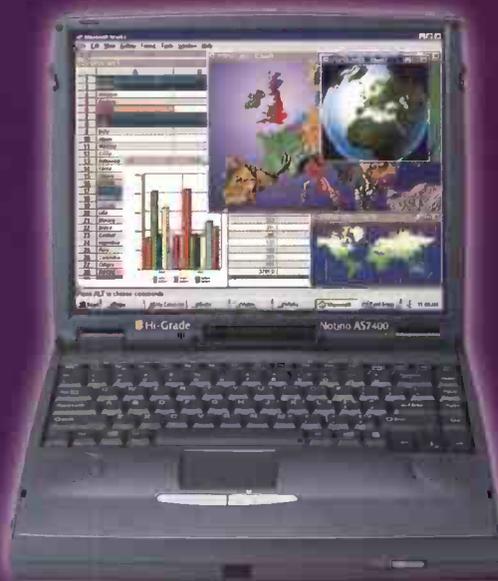
Always at the cutting edge on price and technology, Hi-Grade build every system to order, and hand pick components to ensure maximum reliability and **low cost of ownership.** This, and our commitment to customer service, explains why we owe a large proportion of our business to repeat orders from recommendations and satisfied customers.

In fact, we are so confident that new customers will want to buy Hi-Grade computers again and again, we have put our money where our mouth is. Our **guaranteed 'buy back'** offer allows new customers to trade in their existing Hi-Grade systems for a brand new Hi-Grade computer when it's time to upgrade.

Hi-Grade



# The AS7400 takes the ultimate notebook further



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more power,  
better graphics, a  
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a lower price



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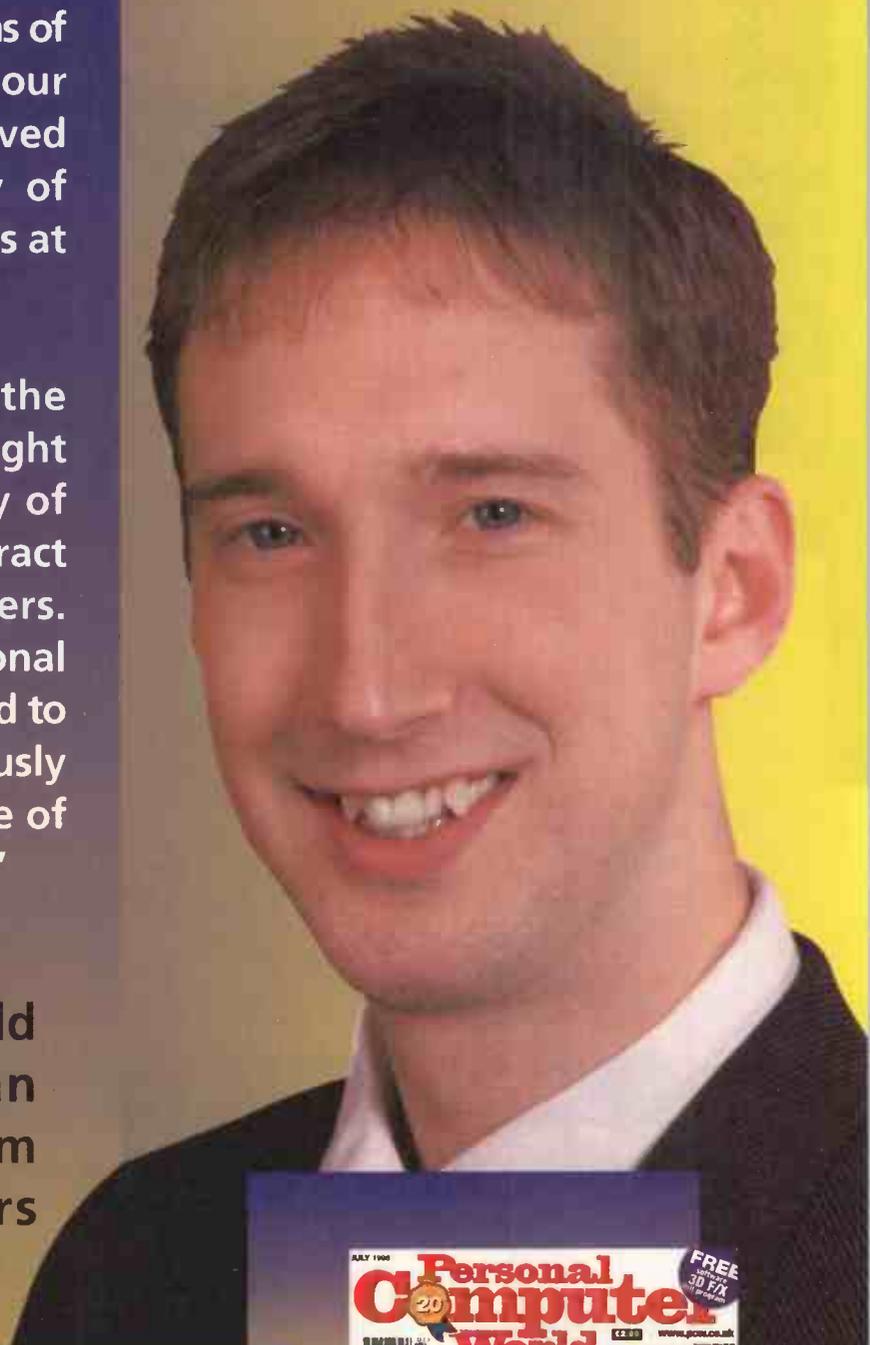
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"CTX are the UK's no. 1 in terms of branded volume shipments of colour monitors. This has been achieved through a consistent strategy of producing high quality products at affordable prices."

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"Personal Computer World provides us with an excellent vehicle to inform and educate customers about our products and brand."



PERSONAL  
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WORLD



*Mike Evans*

Mike Evans  
Marketing Manager CTX

**CTX**



## Siemens Scenic Edition Mi7

It is an understatement to say that we were disappointed with the system Siemens sent us. The compact Scenic was fitted with a Pentium II clocking in at 350MHz and a stunted system memory at 64Mb. Worse, the video card was a 2D-only solution. Today, business graphics require 3D support as a bare minimum. These selections are

fairly reflected in the performance benchmarks. The compromises are extended to the 15in monitor — all the other vendors in the test supplied 17in models. Storage is very low, with only 3.2Gb of EIDE hard disk. Even the lomega Zip 100 does little to improve things. There is little room for enhancing this at your own expense because of the compact



case: only after a bit of shuffling with the existing setup will you have just one 5.25in device bay. It's likely that owners will just replace the hard disk for something that will take the number of applications they need to load. On the plus side, the Mi7 ran smoothly during testing. The build is sturdy, and the Siemens name assures you of quality support should the need arise.

### The monitor was disappointing.

Its viewable area is only 13.8in and it is unacceptable to work at a maximum refresh rate of 60Hz, which is all that's on offer at a resolution of 1024 x 768. Even settling for 800 x 600 resolution is not ideal, as weak registration causes a lack of focus on finely detailed characters.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Siemens Computer Systems  
 01252 555312  
[www.siemens.co.uk/cs](http://www.siemens.co.uk/cs)  
**Good Points** Smooth running.  
**Bad Points** Lacking in many areas.  
**Conclusion** Very disappointing PC from such a well-respected name.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★
<b>Value for Money</b>	★
<b>Overall Rating</b>	★★

## Viglen BizPro C400AS

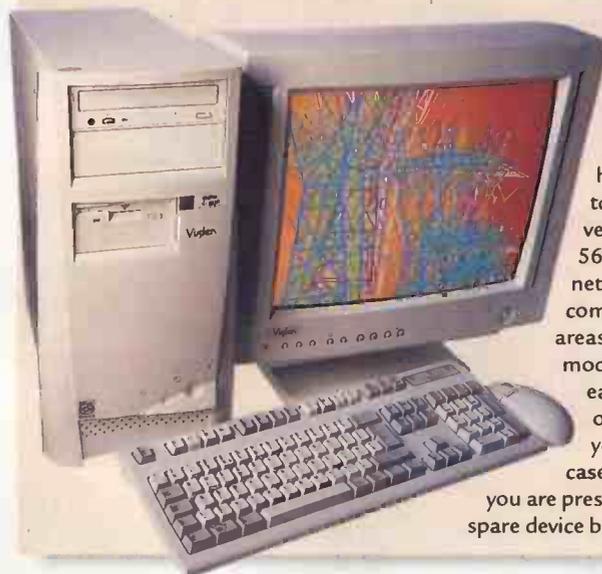
Built around the latest Celeron 400MHz, this fullsome package exudes quality. In support is a full 128Mb system memory, albeit running at the restrictive front-side bus speed of 66MHz; the PIIIs have the advantage of running the RAM at 100MHz. However, the Celeron has another advantage over the PII: its Level 2 cache runs

at the same core speed as the processor rather than half the speed, as on the PII. The Velocity 4400 graphics card, with its whopping 16Mb of video memory, can also be plugged straight into a TV and is perfect for big-screen presentations. Removable storage is catered for by the space-saving LS-120 drive both

for 1.44Mb floppies and the larger 120Mb SuperDisks.

Permanent storage is courtesy of a decent 8.4Gb EIDE hard disk. Viglen has also managed to squeeze in PCI versions of both a 56K modem and a network adapter without compromising other areas. Delving inside modern systems is getting easier, with clip releases or single thumbscrews, yet Viglen's box has six case screws. Once inside,

you are presented with ample spare device bays, wires clipped into



submission and a motherboard free from obstructions.

**A good-quality 17in monitor** was supplied and the built-in speakers will save desktop space. Its crisp, bright display is not affected by cranking up the resolution, managing 1024 x 768 at 85Hz.



### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Viglen 0181 758 7000  
[www.viglen.co.uk](http://www.viglen.co.uk)  
**Good Points** Good display. Latest processor.  
**Bad Points** Case intruders are discouraged.  
**Conclusion** Perfectly balanced system configuration which retains the essential upgrade paths.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

# Intel® Pentium® II 450MHz PC from just £799.00

## Rim 6000V

- Intel 440BX AGPset with 100MHz Front side bus
- Intel Pentium® II processor with MMX Technology
- 32MB High Performance 100MHz SDRAM
- 4.3Gb Ultra DMA 33 Hard Drive (256Kb Cache)
- SC436 Crystal Wavetable Soundcard
- 20 Watt PMPO Multimedia Speakers
- 32x CD ROM Drive
- 15" Colour SVGA FST Monitor (0.28dp)
- 5 PCI, 2 ISA, IPCI/ISA shared and 1 AGP slot
- ATX Desktop or Mini Tower Case
- 105 key Windows 98 PS/2 Keyboard
- Logitech PS/2 Mouse
- 5 year RTB warranty

6350V **£579.00** (£680.33 Inc.VAT)

6400V **£699.00** (£821.33 Inc.VAT)

6450V **£799.00** (£938.83 Inc.VAT)

## Rim 6000AV

- ALI Aladdin Chipset with 100MHz Front Side Bus
- AMD K6-2/3D Processor featuring 3D Now! Technology
- 32MB High Performance 100MHz SDRAM
- 4.3Gb Ultra DMA 33 Hard Drive (256Kb Cache)
- 4MB AGP Graphics Card
- Crystal SC436 Soundcard
- 20 Watt PMPO Multimedia Speakers
- 32x CD ROM Drive
- 15" Colour SVGA FST Monitor (0.28dp)
- 5 PCI, 2 ISA, IPCI/ISA shared and 1 AGP slot
- ATX Desktop or Mini Tower Case
- 105 key Windows 98 PS/2 Keyboard
- Logitech PS/2 Mouse
- Microsoft® Windows 98
- 5 year RTB warranty

6333AV **£545.00** (£640.38 Inc.VAT)

6350AV **£565.00** (£663.38 Inc.VAT)

6380AV **£605.00** (£710.88 Inc.VAT)

6400AV **£675.00** (£793.13 Inc.VAT)

## Rim 6000S

- Intel 440BX AGPset with 100MHz Front Side Bus
- Intel Pentium® II Processor with MMX Technology
- 64MB High Performance 100MHz SDRAM
- 6.4Gb Ultra DMA 33 Hard Drive (256Kb Cache)
- 8MB ATI Expert98 3D AGP Graphics Card
- Creative Labs 64V PCI Soundcard
- 260 Watt PMPO Typhoon Multimedia Speakers
- 32x CD ROM Drive
- 15" Colour SVGA FST Monitor (0.28dp)
- 5 PCI, 2 ISA, IPCI/ISA shared and 1 AGP slot
- ATX Desktop or Mini Tower Case
- 105 key Windows 98 PS/2 Keyboard
- Logitech PS/2 Mouse
- Microsoft® Windows 98
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- Intel 440BX AGPset with 100MHz Front Side Bus · Intel Pentium® II Processor with MMX Technology · 128MB High Performance 100MHz SDRAM
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- 5 PCI, 2 ISA, IPCI/ISA shared and 1 AGP slot · ATX Desktop or Mini Tower Case · Diamond 56k V90 PCI Voice/Data/Fax Modem
- 105 key Windows 98 PS/2 Keyboard · Microsoft® Intellimouse · Microsoft® Windows 98 · Microsoft® Works 4.5 · 5 year RTB warranty

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# The industry leader in technology and reliability

PC PRO Reliability & Service Award Winner 1997 & 1998

Buyers chose Panrix ahead of any other manufacturer as the company they would buy from again.

PC Pro survey 1998

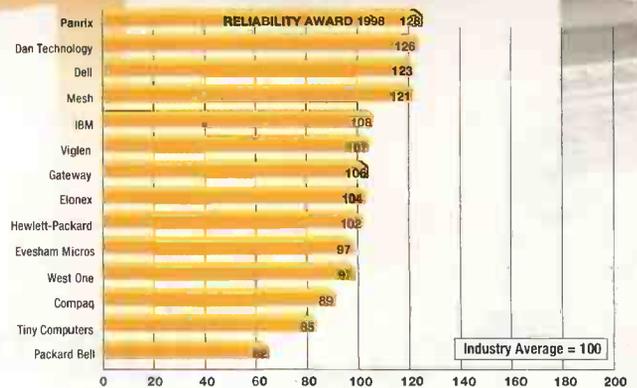


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## Scores for Reliability - PCs



Graph shows the performance of the top 14 PC manufacturers surveyed by PC Pro relative to each other and where relevant to an industry average.



Feb 1999



Jan 1999



Jan 1999



1998 / 99



Dec 1998



Dec 1998



Dec 1998



Dec 1998



Oct 1998



Oct 1998

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'PC Pro' polled thousands of readers to be in the unique position of statistically pinpointing who makes the most reliable PCs, (data processed by independent research specialist Finer Weston). The 1998 Reliability and Service Survey was conducted using a computer program distributed on a cover CD, in addition PC Pro's partner in this research, Microsoft, made the survey program available from its website. From a short list of 15

PC vendors there was one winner...Panrix. Panrix still knows how to make a quality PC and wins this award for the second year running. A low component failure rate allied with good overall reliability of its systems pushed Panrix to the top of the list as manufacturers of the most reliable systems in the industry.

PC Pro Reliability & Service Awards 1998



## Award-winning Internet ready 366Mhz PC systems starting from as little as £695<sup>Ex. VAT</sup>



Model Name	<b>Nitro</b>	<b>Thunder Home</b>	<b>Lightning Office</b>	<b>Fusion-Ultra</b>	<b>Fusion-SCSI</b>
Processor	AMD K6-2 350Mhz CPU	Intel® Celeron™ 366Mhz	Intel® Pentium® II 350Mhz	Intel® Pentium® II 400Mhz CPU	Intel® Pentium® II 450Mhz CPU
Motherboard	Super Socket 7	Intel 440BX Chipset	Intel 440BX Chipset	Intel 440BX Chipset	Intel 440BX Chipset Onboard Adaptec 7890
RAM	32Mb RAM	64Mb SDRAM	64Mb PC100 SDRAM	64Mb PC100 SDRAM	128Mb PC100 SDRAM
Hard Drive	6.4Gb Ultra-DMA	6.4Gb Ultra-DMA	7.5Gb Ultra-DMA 7,200 RPM	10.1Gb Ultra-DMA 7,200 RPM	9.1Gb Ultra SCSI-2 LVD 10,000RPM
Graphics	8Mb Diamond Speedstar AGP	8Mb Diamond Speedstar AGP	8Mb Diamond Speedstar AGP	8Mb AGP Matrox Millennium G200	16Mb AGP Diamond Viper 550 Riva TNT
Floppy Drive	1.44Mb 3.5"	1.44Mb 3.5"	1.44Mb 3.5"	1.44Mb 3.5"	1.44Mb 3.5"
DVD/CD-ROM	36x EIDE CD-ROM	36x EIDE CD-ROM	36x EIDE CD-ROM	40x Asus EIDE	14/32x Ultraplex SCSI
Monitor	15" ProNitron Trinitron .25dp	15" ProNitron Trinitron .25dp	15" ProNitron Trinitron .25dp	17" ProNitron 17/200 .26dp	17" Iiyama VisionMaster Pro
Case	ATX Mini Tower/Desktop	ATX Mini Tower/Desktop	ATX Mini Tower/Desktop	ATX Mini Tower/Desktop	ATX Max Mini Tower/Desktop
Sound Card		PCI Creative SB 64V		PCI Creative SB 64V Wave-Table	PCI Creative SB 128 Wave-Table
Speakers		160 Watt (PMPO) Stereo		160Watt (PMPO) Stereo Speakers	Yamaha M20 stereo
Modem		56.6 V.90 PCI Internal Voice/Fax		56.6 V.90 PCI Internal Voice/Fax	56.6 V.90 PCI Internal Voice/Fax
Keyboard	UK Win. '98 Keyboard	UK Win. '98 Keyboard	UK Win. '98 Keyboard	UK Win. '98 Keyboard	Fujitsu 98 UK Keyboard
Mouse	Microsoft IntelliMouse	Microsoft IntelliMouse	Microsoft IntelliMouse	Microsoft IntelliMouse	Microsoft IntelliMouse
Software	Microsoft Windows '98 CD	MS '98 CD, 10 CD's inc SmartSuite 97	MS '98 CD, MS Works V4.5 CD	MS '98 CD, SmartSuite Millennium	MS NTv4 CD, SmartSuite Millennium
Warranty	12 Months Return to Base	12 Months Return to Base	12 Months On-site	12 Months On-site	12 Months On-site
Price	<b>£565<sup>Ex. VAT</sup></b> <b>£663.88<sup>Inc. VAT</sup></b>	<b>£695<sup>Ex. VAT</sup></b> <b>£816.63<sup>Inc. VAT</sup></b>	<b>£795<sup>Ex. VAT</sup></b> <b>£934.13<sup>Inc. VAT</sup></b>	<b>£1095<sup>Ex. VAT</sup></b> <b>£1286.63<sup>Inc. VAT</sup></b>	<b>£2095<sup>Ex. VAT</sup></b> <b>£2461.63<sup>Inc. VAT</sup></b>
Reference No.	29163	31447	29280	31451	29284
Business lease	£19.76 Per month	£24.31 Per month	£27.81 Per month	£38.30 Per month	£73.28 Per month
Easy PC	£21.20 Per month	£26.27 Per month	£29.41 Per month	£40.71 Per month	£79.15 Per month

Upgrade options	AMD K6-2 400Mhz CPU PCI Creative SB 64V 160Watt (PMPO) Stereo Speakers	Intel® Celeron® Processor 400Mhz 17" ProNitron 17/200 .26dp 10.1Gb Ultra-DMA Hard Drive	128Mb PC 100 SDRAM 17" ProNitron 17/200 .26dp 10.1Gb Ultra-DMA Hard Drive	Intel® Pentium II® Processor 450Mhz 128Mb PC 100 SDRAM 5x DVD Drive M-PEG decoder	Dual Intel® Pentium® II 450Mhz CPU's 256Mb PC100 SDRAM 19" Iiyama Pro VisionMaster
Price	<b>£695<sup>Ex. VAT</sup></b> <b>£816.63<sup>Inc. VAT</sup></b>	<b>£895<sup>Ex. VAT</sup></b> <b>£1051.63<sup>Inc. VAT</sup></b>	<b>£995<sup>Ex. VAT</sup></b> <b>£1169.13<sup>Inc. VAT</sup></b>	<b>£1395<sup>Ex. VAT</sup></b> <b>£1639.13<sup>Inc. VAT</sup></b>	<b>£2795<sup>Ex. VAT</sup></b> <b>£3284.13<sup>Inc. VAT</sup></b>
Reference No.	29164	31448	29281	31453	29285

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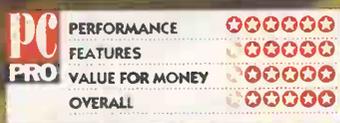
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### NBX GS

The Ultimate Games/Internet Workstation  
New improved specification

Asus P2B BX Chipset Motherboard  
Diamond Viper 550 AGP 16MB 2D/3D Graphics Accelerator  
128MB PC100 100MHz SDRAM  
10.1GB 7200rpm UDMA IBM GXP Hard Drive  
Hitachi GD2500 4x DVD-ROM / 24x CD-ROM. 1.44MB Floppy  
NEW Diamond Monster Sound MX300 with A3D v2 3D Audio Processor  
Yamaha MS25 Speakers with Subwoofer  
Diamond Supra Express PRO 56.6K PCI V90 Modem  
Armari S2 Workstation Midi Tower Enclosure  
17" Iiyama S702GT Monitor  
Keytronics Keyboard & 3 Button Logitech Mouse  
Microsoft Windows 98

### NBX SK

All New Pentium III Workstation  
New specification

Supermicro P6-SBA 440BX Chipset Motherboard  
NEW ATI Fury 32MB AGP D3D / OpenGL Graphics Accelerator  
128MB PC100 100MHz SDRAM  
NEW 22GB 7200rpm UDMA IBM GXP Hard Drive  
NEW Pioneer 6x DVD-Rom / 32x CDROM. 1.44MB Floppy  
Sound Blaster LIVE! 256 PCI Sound card  
CSW PCWorks FourPointSurround Speakers  
Diamond Supra Express PRO 56.6K PCI V90 Modem  
Armari S2 Workstation Midi Tower Enclosure  
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Microsoft Windows 98

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256MB PC100 100MHz SDRAM (1GB max)  
NEW IBM Ultrastar 9ZX (4MB Cache) 9.1GB LVD Ultra 2 10K RPM SCSI Hard Disk  
NEW Plextor UltraPlex 40x SCSI CDROM. 1.44MB Floppy  
Diamond Sonic Impact S90 PCI Sound card  
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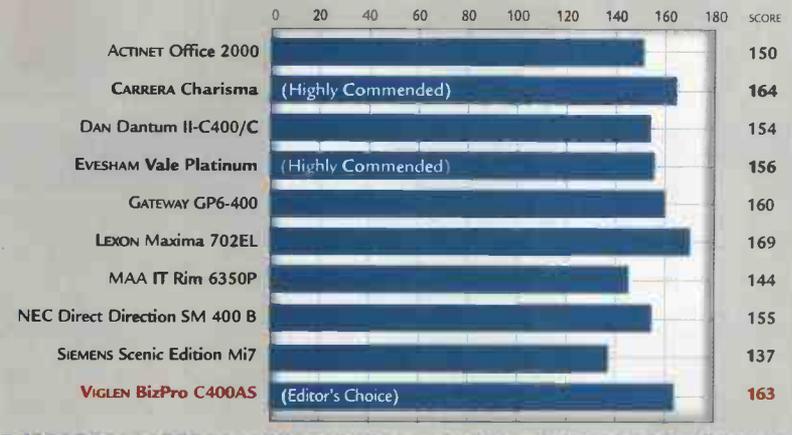
# PCW Labs Report



UPGRADEABLE PC'S >>  
group test

## SYSMark 98 scores

Bigger is better

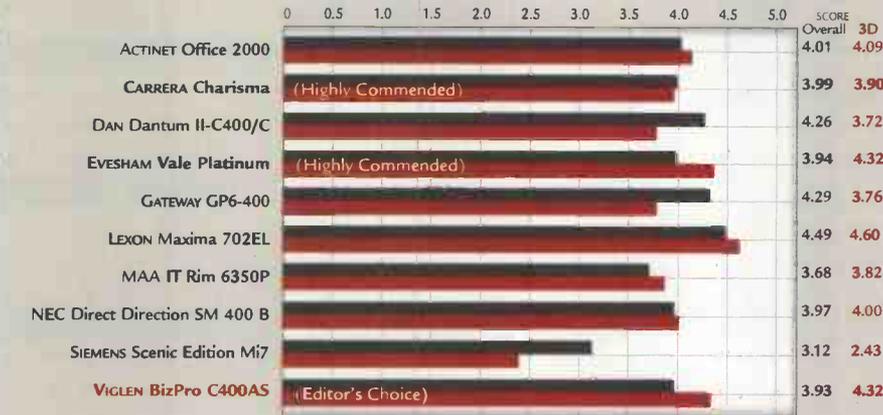


The PII, with its higher front-side bus speed of 100MHz, will beat the latest equally clocked 66MHz Celerons. Yet if you pitch a PII at 50MHz slower clock speed, performance is reduced: compare Viglen and Actinet. The three slowest PCs were those with 350MHz CPUs, showing how close the PII and the Celeron are in performance terms, with the latter having the advantage of Level 2 cache run at the core speed of the processor and the PII benefitting from a faster front-side bus. With the exception of Evesham, the next three slowest performers were those with only 64Mb of system memory. Its poor performance may be best explained through configuration problems or the use of old driver revisions (easily rectified).

Less indicative of system configuration requirements are the results of 3D graphics performance tests. The highest results were achieved by those PCs with the highest video memory resident on their graphics cards, but Evesham's system surprisingly failed to reflect this. The poorest performance was from the Siemens. This is not surprising, considering its choice of the Matrox Productiva G100, a 2D-only solution. Although graphics was not a focus in this group test, most vendors appreciated that 3D support was essential even for office environments and their choice of video cards must be applauded.

## Final Reality scores

Bigger is better



## How we did the tests

We ran two sets of tests on the PCs in this group test: **Final Reality** to test graphics capabilities, and **SYSMark 98** to test the speed of the machines when running 2D and 3D office applications.

➤ **The SYSMark test** measures the speed of the PC running 14 common office and content creation applications, and the time it takes to perform a variety of tasks in each application. Each test is run three times to ensure consistent results.

The applications are divided into two categories:

➤ **Office productivity:** Corel CorelDraw 8, Microsoft Excel 97, Dragon Systems NaturallySpeaking 2.02, Netscape Communicator 4.05 Standard Edition, Caere OmniPage Pro 8.0, Corel Paradox 8, Microsoft PowerPoint 97 and Word 97.

➤ **Content Creation:** MetaCreations Bryce 2, Avid Elastic Reality 3.1, Macromedia Extreme 3D 2, Adobe Photoshop 4.0.1, Adobe Premiere 4.2, and Xing Technology XingMPEG Encoder 2.1.

The number of tests run, and the type of applications used in this benchmark, ensure that all PCs are pushed to the limit, and that even those machines with very powerful processors are given a thorough workout. Performance depends on processor speed, RAM, graphics card and disk I/O. As the tests are based on widely available software packages, SYSMark scores accurately reflect how the machine will perform in a real-world situation.

➤ **Final Reality** is a suite of tests designed to gauge the processing power of the 3D accelerator on your graphics card, 2D image processing and AGP. It runs under Windows 95/98 and DirectX 5 and uses a 3D engine developed by Remedy. It supports Direct3D and looks at how the graphics accelerator handles the kind of data it would have to process when you are playing a game. The visual appearance factors are weighted in importance and combined with the overall processing speed to produce an overall mark.

# Table of features



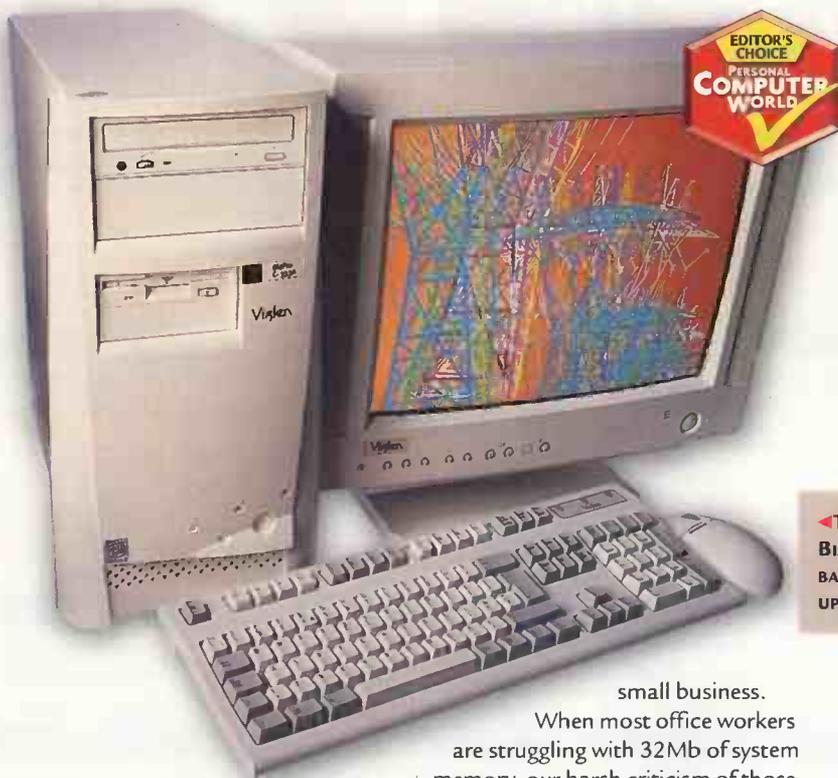
VENDOR	ACTINET COMPUTERS	CARRERA	DAN TECHNOLOGY	EVESHAM	GATEWAY
MODEL NAME	OFFICE 2000	CHARISMA	DANTUM II-C400/C	EVESHAM VALE PLATINUM	GP6-400
Price (ex VAT)	£999	£999	£999	£999	£999
Price (inc VAT)	£1,173.83	£1,173.83	£1,173.83	£1,173.83	£1,173.83
Telephone	01952 270703	0181 307 2800	0181 830 1100	0800 4960800	0800 552000
URL	<a href="http://www.actinet.co.uk">www.actinet.co.uk</a>	<a href="http://www.carrera.co.uk">www.carrera.co.uk</a>	<a href="http://www.dan.co.uk">www.dan.co.uk</a>	<a href="http://www.evesham.com">www.evesham.com</a>	<a href="http://www.gateway.com/uk">www.gateway.com/uk</a>
<b>HARDWARE SPECS</b>					
Processor	Intel Pentium II 350MHz	Intel Pentium II 400MHz	Intel Celeron 400MHz Slot 1	Intel Celeron 400MHz Slot 1	Intel Pentium II 400MHz
RAM / type	128Mb / SDRAM PC100	128Mb / SDRAM PC100	64Mb / SDRAM PC100	128Mb / SDRAM PC100	64Mb / SDRAM PC100
RAM Slots taken / free	2 / 1	1 / 2	1 / 2	1 / 3	1 / 1
Hard disk	Quantum Fireball	Maxtor	IBM	Maxtor	Quantum Fireball
Size / interface	10.2Gb / EIDE	9.1Gb / EIDE	8.4Gb / EIDE	10Gb / EIDE	6.4Gb / EIDE
Storage drive	Iomega Internal Zip	Matshita LS-120 Ver4 06	Matshita LS-120 Ver4 07	Iomega Internal Zip	n/a
Storage drive media size	100Mb	120Mb	120Mb	100Mb	n/a
<b>MOTHERBOARD COMPONENTS</b>					
Motherboard manufacturer	ABIT	SuperMicro	ASUS	Chaintech	Gateway
Model / chipset	AB BH6 / Intel440BX	P6SBA / Intel 440BX	P2B / Intel440BX	6BTM / Intel440BX	E139761 / Intel440BX
L2 cache	512Kb	512Kb	128Kb on processor	128Kb on processor	512Kb
<b>EXPANSION AND I/O</b>					
Free 3.5/5.25in bays	1 / 1	2 / 2	2 / 2	1 / 2	3 / 2
Free PCI/ISA/shared slots	2 / 0 / 1	1 / 2 / 1	2 / 1 / 0	0 / 2 / 1	3 / 0 / 1
USB/Serial/Parallel/PS2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 1 / 1 / 2
<b>MULTIMEDIA</b>					
CD-ROM	Toshiba / XM-6402B	LG / CRD-8322B	Matshita / CR-588	Matshita / CR-589	Mitsumi/CRMC-FX322M2
CD-ROM speed/interface	36x / EIDE	32x / EIDE	32x / EIDE	32x / EIDE	32x / EIDE
Sound card manufacturer	Data Expert	Creative Labs	Creative Labs	Creative Labs	Creative Labs
Sound card model	Yamaha OPL3-SAx	SoundBlaster PCI64	SoundBlaster PCI64	SoundBlaster PCI64	ES1373
Speakers	Maxxtro SPK202	Turando 25W	Dan 150W PMPO	Zydec ZY-FI 2	n/a
Graphics card	Diamond Viper 550	ATI Xpert98	Matrox Millennium G200	STB Velocity 4400	Nvidia Riva128ZX
RAM / max RAM / type	16Mb / 16Mb / SDRAM	8Mb / 8Mb / SGRAM	8Mb / 16Mb / SGRAM	16Mb / 16Mb / SDRAM	8Mb / 8Mb / SGRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP (on-board)
Monitor	Hansol / 701A / 17in	LG / Studioworks 77i / 17in	CTX / VL700 / 17in	Taxan / Ergovision 730 / 17in	Gateway / VX700 / 17in
Max refresh 800 x 600	100Hz	85Hz	85Hz	100Hz	120Hz
Max refresh 1024 x 768	85Hz	75Hz	85Hz	85Hz	100Hz
Max refresh 1280 x 1024	60Hz	60Hz	60Hz	60Hz	75Hz
Max refresh 1600 x 1200	n/a	n/a	n/a	n/a	60Hz
<b>OTHER INFORMATION</b>					
Modem	Rockwell V.90 (PCI)	n/a	Rockwell V.90 (ISA)	Diamond SupraExpress 56i PCI	n/a
Modem speed	56Kbps	n/a	56Kbps	56Kbps	n/a
Misc hardware	D-Link DE-528CT	Intel 10/100Mbps	3COM 10/100Mbps	3COM 10/100Mbps	n/a
	10Mbps Ethernet Card	Ethernet Card	Ethernet Card	Ethernet Card	
Bundled software	MS Windows 98, MS Office 97 Professional	MS Windows 98	Windows 98, Works4.5a Lotus SmartSuite 97	Windows 98	Windows 98, Outlook 97,  Publisher 98, Word 97
Standard warranty	1st yr on site, 4yrs RTB	1st yr p+l, 2nd yr lab	12 months	2 yr osm	1st yr on site, 2 yrs RTB
Warranty options	3 yrs on site £149	on application	on site £35 / yr	3rd year £99	3yrs on site £149

# Table of features



VENDOR	LEXON TECHNOLOGY	MAA IT	NEC DIRECT	SIEMENS	VIGLEN
MODEL NAME	LEXON MAXIMA 702EL	RIM 6350P	DIRECTION SM 400 B	SCENIC EDITION MI7	BizPro C400AS
Price (ex VAT)	£999	£999	£999	£999	£ 999
Price (inc VAT)	£1,173.83	£1,173.83	£1,173.83	£1,173.83	£ 1,173.83
Telephone	0181 667 1173	0870 6069696 / 0171 646 2000	0870 0106324	01252 555312	0181 758 7000
URL	<a href="http://www.lexonpc.com">www.lexonpc.com</a>	<a href="http://www.maait.co.uk">www.maait.co.uk</a>	<a href="http://www.necdirect-europe.com">www.necdirect-europe.com</a>	<a href="http://www.siemens.co.uk/cs">www.siemens.co.uk/cs</a>	<a href="http://www.viglen.co.uk">www.viglen.co.uk</a>
<b>HARDWARE SPECS</b>					
Processor	Intel Pentium II 400MHz	Intel Pentium II 350MHz	Intel Pentium II 400MHz	Intel Pentium II 350MHz	Intel Celeron 400MHz Slot 1
RAM / type	128Mb / SDRAM PC100	128Mb / SDRAM PC100	64Mb / SDRAM PC100	64Mb / SDRAM PC100	128Mb / SDRAM PC100
RAM Slots taken / free	1 / 2	1 / 3	1 / 2	1 / 1	1 / 2
Hard disk	Seagate Medalist Pro	Fujitsu	Maxtor	Maxtor	IBM
Size / interface	9.1Gb / EIDE	10.2Gb / EIDE	8.4Gb / EIDE	3.2Gb / EIDE	8.4Gb / EIDE
Storage drive	lomega Internal Zip	lomega Internal Zip	n/a	lomega internal Zip	Matshita LS-120 Ver4 07
Storage drive media size	100Mb	100Mb	n/a	100Mb	120Mb
<b>MOTHERBOARD COMPONENTS</b>					
Motherboard manufacturer	ASUS	Gigabyte Technology	Intel	Siemens	Viglen
Model / chipset	P2B (Rev. 1.02) / Intel 440BX	GA-6BXE / Intel 440BX	SE440BX / Intel 440BX	F10 GS / Intel 440BX	VIG69M / Intel 440BX
L2 cache	512K	512K	512K	512K	128K on processor
<b>EXPANSION AND I/O</b>					
Free 3.5/5.25in bays	0 / 2	2 / 2	1 / 2	0 / 0	2 / 2
Free PCI/ISA/shared slots	0 / 2 / 1	3 / 1 / 1	1 / 1 / 1	2 / 0 / 0	1 / 2 / 0
USB/Serial/Parallel/PS2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 1 / 1 / 2	2 / 2 / 1 / 2
<b>MULTIMEDIA</b>					
CD-ROM	Creative Labs / CD3630E	Pioneer / DR704s	Hitachi DVD / GD-2500	Mitsumi / FX322M	Panasonic / CR-588
CD-ROM speed/interface	36x / EIDE	32x / EIDE	24X (4X DVD) / EIDE	32X / EIDE	32X / EIDE
Sound card manufacturer	Creative Labs	Creative Labs	Creative Labs	Terratec	Yamaha
Sound card model	SoundBlaster PCI164	SoundBlaster PCI164	SoundBlaster PCI164	Promedia AD1816	Labway XG
Speakers	Creative Labs CSW20	Typhoon	Labtec LS2420	n/a	n/a
Graphics card	Diamond Viper 550	Diamond Stealth G460	ATI Xpert98 (w/TV-out)	Matrox Productiva G100	STB Velocity 4400 (w/TV-out)
RAM / max RAM / type	16Mb / 16Mb / SDRAM	8Mb / 8Mb / SGRAM	8Mb / 8Mb / SGRAM	4Mb / 4Mb / SGRAM	16Mb / 16Mb / SDRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP
Monitor	Mag/XJ707T Tron/17in	M'bishi/DiamondScan 70/17in	NEC/Multisync70/17in	Siemens/MCM152V/15in	Envy/17CS/17in
Max refresh 800 x 600	100Hz	100Hz	100Hz	85Hz	100Hz
Max refresh 1024 x 768	85Hz	85Hz	85Hz	60Hz	85Hz
Max refresh 1280 x 1024	60Hz	60Hz	60Hz	n/a	60Hz
Max refresh 1600 x 1200	n/a	n/a	n/a	n/a	n/a
<b>OTHER INFORMATION</b>					
Modem	Lexon 56Kflex Internal	n/a	Diamond SupraExpress	n/a	CIS PCI (Rockwell V.90)
Modem speed	56Kbps	n/a	56Kbps	n/a	56Kbps
Misc hardware	3COM 10/100Mbps Ethernet Card	n/a	n/a	n/a	Viglen Ethergreen 3200P 10/100Mbps Ethernet Card
Bundled software	Windows 98, SuperVoice, Lotus SmartSuite 97	Windows 98, Lotus SmartSuite 97	Windows 98, CorelDraw7, IBM Via Voice, Works 4.5a, McAfee VirusScan, Word 97	Windows 98, Dr Solomon Anti-Virus Toolkit, MS Office 97 Professional	Windows 98, MS Office SBE
Standard warranty	1st yr on-site, 2nd yr RTB (p+)	5 years RTB	3 yrs, 1 yr on site	1 yr on site, 3 yrs RTB	1 year collect and return
Warranty options	on site - 2 yrs £55, 3 yrs £90	On site £49/yr, 3 yrs os £129	1, 2 or 3 yrs on site	3 yrs on site £150	Options inc 4-hr response osm

# Editor's Choice



suitably spent elsewhere. Supplying a full memory quota of 128Mb and a bay-saving LS-120 goes some way to prove Viglen's understanding of its market. Construction is admirable, and efforts have been made towards providing the upgrade paths which would be necessary to prolong the life of this machine.

➤ Evesham Micros' **EveshamVale Platinum** is **Highly Commended**. It was a tough contender for our Editor's Choice, just lacking in that final panache required to raise its head above the

◀ **THE VIGLEN BizPRO**, PERFECTLY BALANCED AND UPGRADEABLE

Viglen. On paper, it comprised an almost perfect selection of components with generous storage and an excellent choice of

monitor. Performance was marred by an unknown factor which could only be explained through configuration problems or even driver revisions. But as tune-ups are easily dealt with, the award reflects the overall package.

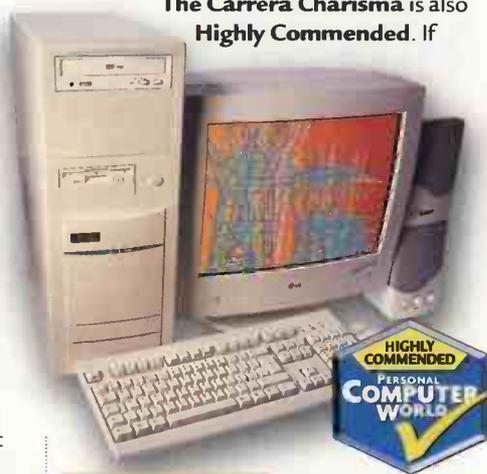
➤ **The Carrera Charisma** is also **Highly Commended**. If

**W**e wanted small business machines at a modest price of £999 (ex VAT), which would be easy to upgrade. The detailed specifications were left to the manufacturers, so our vendors were free to put together some highly individual systems. Overall the machines' specifications were fairly modest, with vendors perhaps erring on the side of caution in view of recent component-price fluctuations. Nevertheless, all the machines supplied would last for some time in a

▼ **OPEN UPGRADE OPTIONS WITH THE EVESHAMVALE PLATINUM**

small business. When most office workers are struggling with 32Mb of system memory, our harsh criticism of those vendors supplying new systems with 64Mb may seem churlish. Considering that memory is the cheapest component, increasing this provides the most substantial performance improvements and so the expected long life of these machines warranted no less than 128Mb to be supplied. Similarly, the choice of storage capacity was generous, with most vendors supplying hard disks larger than 8Gb, as well as removable storage media, providing all end-users with at least one means of backup. With the exception of Siemens, all vendors supplied 17in displays: when most spreadsheets dictate resolutions of 1024 x 768, this is the minimum acceptable size for monitors. Most video cards supplied were good enough to power excellent displays.

➤ **Viglen's BizPro C400AS** is our **Editor's Choice**. It manages to supply everything a small business could ask for, plus a little bit more. It may have been pipped at the post in performance terms, but the money saved by supplying a Celeron-powered machine was



▲ **THE CARRERA CHARISMA MUSCLE MACHINE**

Carrera's personality is represented in this package,

picking a fight is not recommended: this PC is one of the more powerful contenders, with massive storage capabilities housed in a bulky case. Where other vendors' intentions to offer upgrade paths were admirable, you'd have to act almost immediately. Carrera offers a quality construction that allows you to leave your upgrading options open. □



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## RESOLUTION

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MONITORS >>

group test

# Scene on the screen



**Don't cut corners when you choose a monitor — it's probably the most important part of your setup. We've tested a range of units to suit most budgets and put you in the picture about size, type of screen and the latest technology.**

It's a sad fact of life that the most important component of any PC is the one that's the first to be compromised when the budget gets squeezed. These days, everybody wants incredibly fast processors and huge amounts of RAM, so that a budget system which is fantastic value is liable to come with a 14in goldfish bowl of a monitor, unfit for any kind of prolonged use since that's where corners can be cut without being too noticeable on the spec sheet.

**The fact remains** that your monitor is the main interface between you and your machine. Without one, a PC is just an expensive electronic space-heater. Recent research has proved beyond doubt that a decent-quality monitor can have a profound impact on productivity, reducing fatigue and increasing accuracy. You should consider a 17in CRT monitor the minimum requirement if you use your PC for more than an hour at a time.

**Here, we've rounded up** a variety of monitors of different sizes and price points. So, we have eight 17in CRTs and eight TFTs. We also take a look at 19in units, featuring four monitors representing the four tube technologies, as well as the new breed of flatscreen CRTs. And, in case you were wondering, we explain the difference between display technologies and show how to correctly set up your display for optimum performance, too.

## Ratings

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

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◆ Tested and reviewed by David Fearon

# Setting up your monitor

**E**ven if you have the most expensive display on the market, don't assume that it needs no adjustment. All CRT monitors need adjusting, and correct placement of the display is equally important whether you have a CRT or LCD flatpanel screen.

**The most basic adjustments** that need to be set are the brightness and contrast controls. These are dependent on lighting conditions, so they should be re-adjusted if you move the display. Setting them correctly is a fairly simple task. With a CRT, first turn the contrast down to zero, then turn the brightness up to maximum. Look in the bottom corners of the screen: you should see that the background of the display goes from grey to black where the phosphor coating ends. Turn the brightness down until the interface between the grey and the black just disappears.

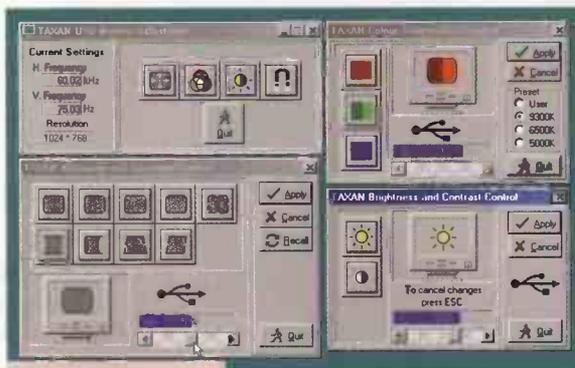
It's slightly harder to be precise about contrast. The easiest way is to turn it up until white text looks like true white, but not so far that the edges start to look blurred. You'll generally find that with the brightness correctly adjusted, the

contrast will need to be set quite near the end of its range (between 75 and 90 percent of maximum). Flatpanels often have a more limited adjustment range, but it's generally best to keep the brightness low and the contrast high.

**Size and position** of the display is also important if you want to get the most out of the available screen area. Some CRT monitors have a button that attempts to automatically adjust the size and position of the image. This doesn't always work correctly though, since a CRT can't sense precisely where the electron beam is hitting the phosphor coating at the front of the tube.

If you want to get the biggest display possible, you can adjust the size of the picture into the corners of the screen but you'll tend to get distortion at the edges. Most CRT monitors will give the best picture when there is a gap of about a centimetre around the edge of the viewable area.

For flatpanels, you need to adjust the clock and phase controls to make sure that the picture covers the entire surface of the display, otherwise you'll get unpleasant bands of aliasing distortion.



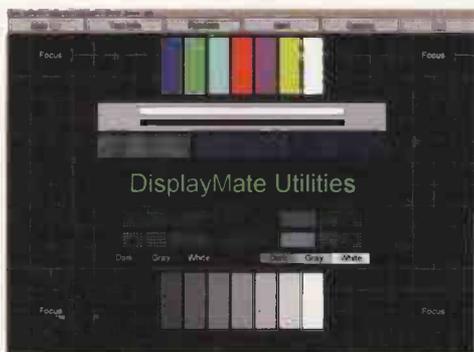
▲ TAXAN'S WINDOWS-DRIVEN ON-SCREEN DISPLAY

CRT displays also need geometry correction because a CRT display cannot sense exactly where the

beam is going. LCD panels have inherently perfect geometry performance.

The most common forms of geometry distortion are pincushion or barrel distortion, where the side of the picture bows in or out, and trapezoid distortion where the top of the picture is wider or narrower than the bottom. Inaccurate geometry won't cause fatigue or eyestrain though, in the same way as poor focus or resolution.

**One of the most important factors** in monitor adjustment is placing the display in the best physical position, to lessen fatigue. Until recently, the general advice was that the centre of the screen should be at eye level, so the user was looking straight ahead for most of the time. This advice has now changed for sound physiological reasons: it's more natural to be looking downwards at your hands when focusing on close objects, so have the monitor slightly below you, with the top of the display at eye level.



◀ DISPLAYMATE, A VITAL TOOL FOR SETTING UP YOUR MONITOR

## CONNECTIVITY

**T**he more expensive monitors have two sets of video inputs. The first is a standard VGA D-type connector — the same as the connector on your graphics card. The second is through BNC connections which separate the components of the video signal into five separate connectors. This decreases interference (crosstalk) since the

components of the signal are shielded from each other. But unless you have a graphics card that also has separate BNC connectors, the benefit will be marginal at best. The advantage of having two inputs is that it allows you to use one monitor with two computers, say a PC and a Mac. If you're going to use this feature, it's useful if the monitor has a dedicated

front-panel button to switch between machines. New to monitors is USB connectivity. This is not a method of transmitting the video signal to the monitor: USB's 12Mbit/sec bandwidth is not high enough. USB connectors are appearing on

monitors because they make an ideal place for a USB hub. A couple of the displays in our group test also allow USB control of the monitor's adjustments in software.



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Interface	Ultra SCSI (9LP) Ultra2 SCSI Fibre Channel	Ultra SCSI (18) Ultra2 SCSI Fibre Channel	Ultra2 SCSI Fibre Channel	Ultra2 SCSI Fibre Channel
RPM	7,200	7,200	10,000	10,000

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## ADI MicroScan GT56



The GT56 is the very latest display from ADI: we managed to get hold of the first and only one in Europe for this group test. It was worth the wait: its colour reproduction is fantastically even and pure. Like the CTX [below] it sports a Trinitron tube but it has the added bonus of four USB ports and a built-in microphone. And although the CTX just beats it when it comes to resolution, if you buy a GT56 you're unlikely to regret it.

★★★★★

## Belinea 10 70 50



When it was originally released, the 10 70 50 represented remarkable value for money for an aperture grille display. But since then, the competition has caught up, with CTX, Viewsonic and ADI vying for the 17in aperture grille crown. This Belinea can still put up a fight though, with the combination of a good tube and electronics for a sharp, clear display with no obvious problems. The OSD is basic though, and there are no extra features such as USB.

★★★

## CTX PR710T



In the past, CTX has perhaps been known more for cheap-and-cheerful displays than a presence in the higher echelons. But this has changed. Not only does the PR710T look gorgeous, its performance is stunning. It sports a genuine Sony Trinitron tube, which is always a good sign. Power regulation, resolution, colour alignment and colour purity are all of the highest order, leading to a display that you can see is special straight away. A clear winner.

★★★★★

## LG StudioWorks 795SC



The 795SC is a little uninspiring to look at and produces a fairly uninspiring display, too. It's a shadow mask unit with the screen curved in both the horizontal and vertical directions. There's just the one D-SUB input and it doesn't have any USB ports. The OSD is comprehensive and easy to use, and image quality is good but not remarkable. Horizontal resolution wasn't perfect and colour convergence was slightly awry, but the LG would make a good, basic office display.

★★★

## Table of features

MANUFACTURER/MODEL	ADI MICROSCAN GT56	BELINEA 10 70 50	CTX PR710T	LG STUDIOWORKS 795SC
Price ex VAT	not supplied	£295	£363	£249
Approx street price (ex VAT)	£299 including USB hub	£259	£309	£249
Tel	0181 236 0801	0118 936 2900	01923 810800	01753 500470
URL	<a href="http://www.adiusa.com">www.adiusa.com</a>	<a href="http://www.maxdata.co.uk">www.maxdata.co.uk</a>	<a href="http://www.ctintl.com">www.ctintl.com</a>	<a href="http://www.lge.co.kr">www.lge.co.kr</a>
Visible diagonal	16in	15.9in	16in	15.9in
Tube type	Aperture grille (Trinitron)	Aperture grille (Diamondtron)	Aperture grille	Shadow mask
Max horizontal frequency	95kHz	95kHz	95kHz	100kHz
Max resolution	1600 x 1200 75Hz	1600 x 1200 60Hz	1600 x 1200 72Hz	1600 x 1200 80Hz
Max refresh 1024 x 768	85Hz	85Hz	85Hz	85Hz
Dot/grille pitch	0.25mm	0.25mm	0.25mm	0.26mm
Connections (BNC, DSUB)	D-SUB	BNC, D-SUB	BNC, D-SUB	D-SUB
Dimensions (WxHxD), weight	439 x 441 x 441mm, 21kg	536 x 522 x 565mm, 23kg	418 x 430 x 446.5mm, 21.3kg	416 x 432 x 440mm, 18kg
Power consump max / suspend	140W / <8W	130W / <8W	130W / <10W	130W / <8W
OSD geometry functions	h/v lin, trap, rot, sidepin, pin	pin, trap, par, rot	pin, sidepin, trap, par, rot	pin, sidepin, par, pin s-bow, pin w-bow
Other OSD features	ct, moiré, h/v con	ct, h/v con, moiré, signal select	h/v con, ct	zoom, h/v moiré, h con, col purity, ct
Other features (USB etc)	USB (1 upstr, 4 downstr), mic	-	Front panel signal select	-
Standards compliance	TCO99	TCO95	TCO95	TCO95

OSD key: lin = linearity, trap = trapezoid, rot = rotation, sidepin = side pincushion, pin = pincushion, par = parallelogram, ct = colour temperature, h/v con = horizontal and vertical convergence

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## Mag XJ700T



Like the CTX and the ADI, the Mag is fitted with a Sony Trinitron tube. However, it seems to have been rather let down by its supporting electronics. Colour purity is very good, as you'd expect from a Trinitron, but power regulation is appalling, leading to a display that 'bounces' when opening and closing windows. Focus is poor too, presenting a slightly fuzzy picture that gave our testers headaches. It's probably the cheapest Trinitron display around but you can do much better for just a little more money.

★★

## Nokia 447XS



The 447XS has all its controls on the right-hand side, resulting in a reduction in height and making the unit look very squat indeed. It works pretty well though, with the controls falling naturally to hand. The display itself is a shadow mask and slightly smaller than the rest, with a 15.7in viewable diagonal. In use, colours are unusually vibrant for a shadow mask and the display is crisp with no signs of ghosting. Four USB ports nestle in the base.

★★★

## Taxan Ergovision 745 TCO99



While Taxan does make aperture grille monitors, the one the company chose to send for this test has a shadow mask tube. However, many people prefer to use a shadow mask screen. Taxan's expertise shows in the 745. It's easily the best shadow mask display in this group test, with an extremely crisp image and excellent technical performance. Power regulation is superb and there are no signs of unpleasant effects such as ghosting or defocusing. As the name suggests, it conforms to TCO99 standards and sports a USB hub in the base.

★★★★

## ViewSonic PT775



This is one of the more expensive 17in displays in the test but the PT775 is backed by very good performance. It displayed excellent resolution, colour alignment and focus, which add up to a very sharp picture. Vibrancy and purity of colour weren't quite up to the standard of the CTX or the ADI, though. There's no USB support but there are both D-SUB and BNC video inputs. The ViewSonic should definitely be on your 17in shortlist.

★★★★

## Table of features

MANUFACTURER/MODEL	MAG XJ700T	NOKIA 447XS	TAXAN ERGOVISION 745 TCO99	VIEWSONIC PT775
Price (ex VAT)	£240	£299	£275	not supplied
Approx street price (ex VAT)	£228	£299	£262	£325
Tel	01189 752445	01793 512809	01344 484646	0800 833648
URL	<a href="http://www.magin.co.uk">www.magin.co.uk</a>	<a href="http://www.nokia.com">www.nokia.com</a>	<a href="http://www.taxan.co.uk">www.taxan.co.uk</a>	<a href="http://www.viewsonic.com/europe">www.viewsonic.com/europe</a>
Visible diagonal	16in	15.7in	16in	16in
Tube type	Aperture grille (Trinitron)	Shadow mask	Shadow mask	Aperture grille (SonicTron)
Max horizontal frequency	70kHz	86kHz	95kHz	96kHz
Max resolution	1280 x 1024 60Hz	1280 x 1024 75Hz	1600 x 1200 75Hz	1,600 x 1,200 77Hz
Max refresh 1024 x 768	85Hz	85Hz	85Hz	85Hz
Dot/grille pitch	0.25mm	0.25mm	0.26mm	0.25mm
Connections (BNC, DSUB)	D-SUB	captive cable	D-SUB	BNC, D-SUB
Dimensions (WxHxD), weight	421 x 423 x 433mm, 18.4kg	445 x 372 x 389mm, 18.5kg	412 x 427 x 428mm, 18kg	415 x 427 x 457mm, 21kg
Power consump max / suspend	<120W / <15W	<100W / <7W	<140W / <8W	<130W / <8W
OSD geometry functions	pin, trap, rot	rot, trap, par, pin, pin side	pin, sidepin, trap, par, rot	pin, sidepin, trap, par, hourglass, hooking, rot
Other OSD features	colour temperature	Auto shape, moiré, ct	zoom, colour temp	h/v con, h/v focus, colour purity, ct, moiré
Other features (USB etc)	-	USB (1 upstr, 4 downstr)	USB (1 upstr, 4 downstr)	-
Standards compliance	TCO92	TCO95	TCO99	TCO95

OSD key: lin = linearity, trap = trapezoid, rot = rotation, sidepin = side pincushion, pin = pincushion, par = parallelogram, ct = colour temperature, h/v con = horizontal and vertical convergence



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MODEL	401A	500A	501P	701A	700P	900P
CRT Size	14"	15"	15"	17"	17"	19"
Dot Pitch mm	0.28	0.28	0.28	0.28	0.26	0.26
Viewable	13.2"	13.8"	13.8"	15.7"	15.7"	18"
Maximum Res	1024x768	1024x768	1280x1024	1280x1024	1600x1200	1600x1200
On Screen Display			Yes	Yes	Yes	Yes

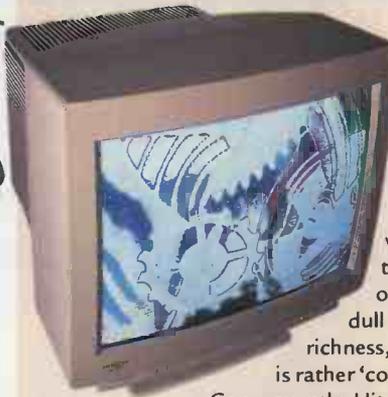


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## Hitachi CM752ET



Hitachi's shadow mask-based monitor turned in a good all-round performance with sharpness and resolution, power regulation and colour convergence. It's not very exciting to look at, though, either in terms of image, which is a little dull and lacks colour richness, or overall design which is rather 'corporate' and boring.

Consequently, Hitachi is probably selling bundles for the desktops of large corporations, but you'd be better advised to go for one of the superior and much cheaper 19in designs. ★★

## Mitsubishi Diamond Pro 900u



Given that Mitsubishi is the developer of the Diamondtron NF, you'd think the company would keep the best tubes for itself. However, the Diamond Pro 900u is actually slightly less impressive than the Iiyama Vision Master Pro 450 [p189]

when it comes to horizontal resolution and colour purity, but it is excellent nonetheless. It's free of the slight ghosting that the Iiyama showed and has the added bonus of USB, including a front-panel drop-down port. ★★★★★

## NEC MultiSync E900+



Like the Hitachi, the NEC, with its ChromaClear tube, is another reasonable all-rounder, although horizontal and vertical resolution was not all it should have been and colour purity was rather lacking. The shadow-mask screen seems excessively curved; a factor which sticks out like a sore thumb in the company of aperture grilles and flat-screen units. It's not quite as expensive as the Hitachi but it's still overpriced in comparison with its competition. Not as impressive as NEC's LCD panel. ★★

## Sony Multiscan 420GS



Sony has probably the best reputation in the world when it comes to CRTs — the company invented the Trinitron tube. The 420GS doesn't sit at the top of Sony's 19in range; that space belongs to the more expensive PS series. And in this case, although its picture is undeniably excellent, it's not as sharp as either the Mitsubishi or Iiyama 19in units and to our amazement its colour purity wasn't up to scratch either. A relatively disappointing performance. ★★★★★

## Table of features

MANUFACTURER/MODEL	HITACHI CM752ET	MITSUBISHI DIAMOND PRO 900U	NEC MULTISYNC E900+	SONY MULTISCAN 420GS
Price (ex VAT)	£610	not supplied	not supplied	£449
Approx street price (ex VAT)	£500	£435	£578	£449
Tel	0181 849 2000	0800 7311222	0645 404020	0990 424 424
URL	<a href="http://www.hitachi.com">www.hitachi.com</a>	<a href="http://www.meuk.mee.com/monitors">www.meuk.mee.com/monitors</a>	<a href="http://www.euronec.com">www.euronec.com</a>	<a href="http://www.sony.com">www.sony.com</a>
Visible diagonal	18in	18in	18in	18in
Tube type	Shadow mask	Aperture grille (Diamondtron NF)	Shadow mask	Aperture grille (Trinitron)
Max horizontal frequency	101kHz	95kHz	96kHz	96kHz
Max resolution	1600 x 1200 75Hz	1600 x 1200 75Hz	1600 x 1200 75Hz	1600 x 1200 75Hz
Max refresh 1280 x 1024	85Hz	85Hz	85Hz	85Hz
Dot/grille pitch	0.22mm horizontal*	centre 0.25mm, edges 0.27mm	0.26mm	centre 0.25mm, edges 0.27mm
Connections (BNC, DSUB)	D-SUB	D-SUB, BNC	D-SUB	Captive cable + front panel D-SUB
Dimensions (WxHxD), weight	448 x 454 x 460mm, 25kg	570 x 610 x 585mm, 30kg	447 x 462 x 482mm, 23.8kg	444 x 467 x 455mm, 26kg
Power consump max / suspend	125W / <15W	140W / <8W	150W / <8W	140W / <8W
OSD geometry functions	pin, trap, sidepin, par, rot	pin, sidepin, par, trap, rot	pin, par, trap, rot	pin, sidepin, par, trap, rot
Other OSD features	ct, h/v moiré	ct, moiré, h/v con	ct, moiré, vert linearity, h/v con	zoom, ct, h/v con, moiré
Other features (USB etc)	-	USB (2 upstr, 3 downstr)	-	front panel signal select, autosize
Standards compliance	TCO95	TCO95	TCO95	TCO 95

OSD key: lin = linearity, trap = trapezoid, rot = rotation, sidepin = side pincushion, pin = pincushion, par = parallelogram, ct = colour temperature, h/v con = horizontal and vertical convergence

\* Horizontal dot pitch is not equivalent to normal diagonal dot pitch



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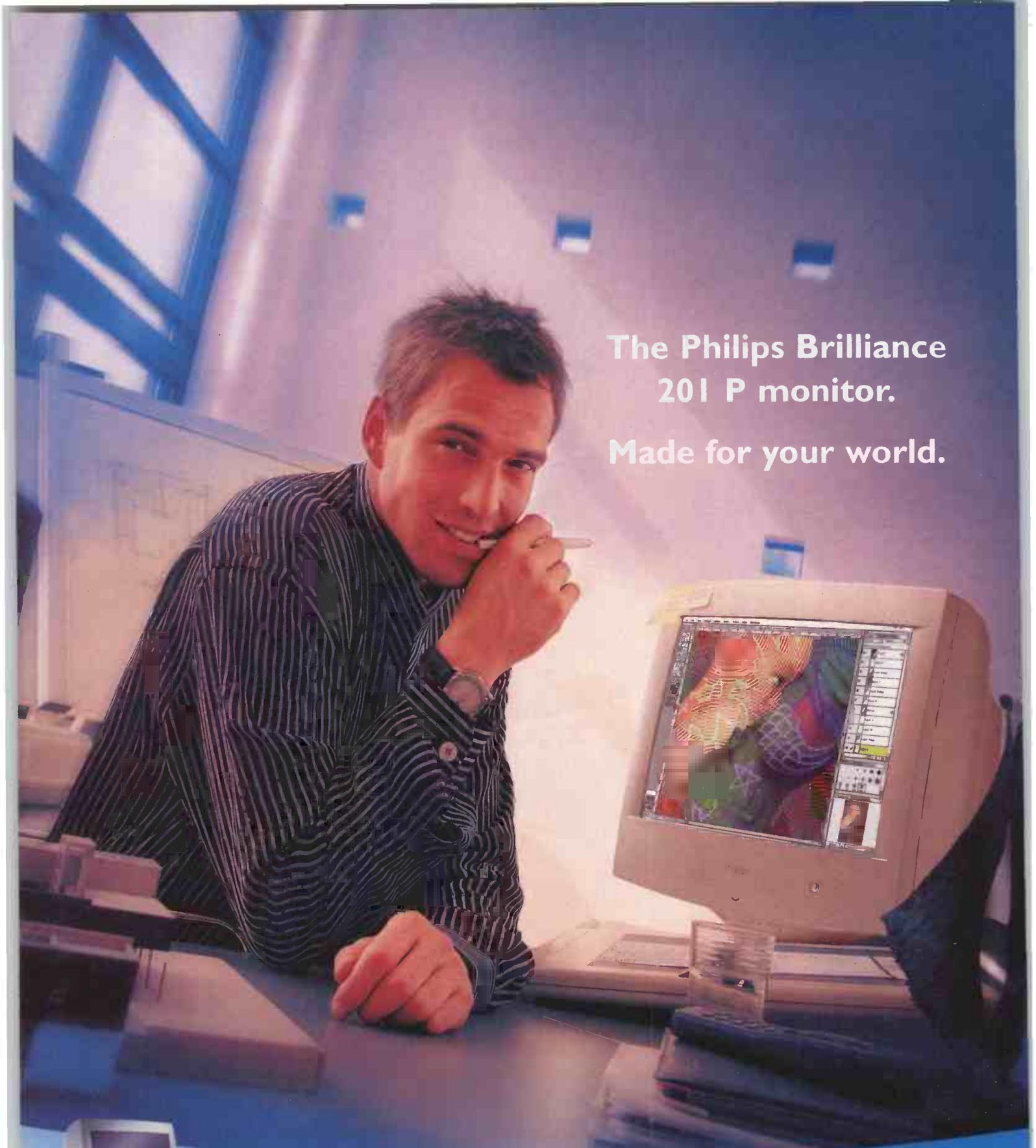
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# Flatscreen CRTs

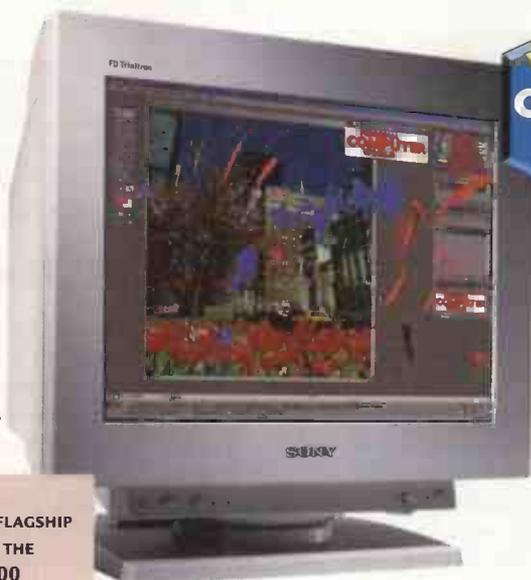
**S**ony and Mitsubishi, currently the only companies making flatscreen CRTs (cathode ray tubes), haven't begun to do so just for the fun of it. Making a flatscreen tube is a huge technical problem requiring all sorts of highly sophisticated circuitry and production techniques, and only three of the CRT monitors in this month's test have these tubes.

The primary barrier to producing a flat CRT is simply that the edges of the screen are further away from the electron gun than the centre. This means that if the electron beam is correctly focused on the phosphor at the centre of the screen while at the edges, it will be out of focus due to the increased distance. There's also the problem of the beam shape, which will tend to be elliptical when hitting the edges of the tube because it travels through the aperture grille at an angle.

These problems are also present in conventional CRTs but to a lesser extent. And, at the extremely high frequencies at which the electron gun circuitry has to operate, increasing its performance further is no easy matter. It has required the gradual evolution of dynamic beam focusing, shaping and intensity circuitry, as well as the competition from LCD flatpanels, to enable the production of Mitsubishi's Diamondtron NF and Sony's FD Trinitrons.

**What are the benefits of having a flat-screen CRT?** Well, there's a pretty strong argument for the case that the only reason CRT makers are currently producing them is to stave off competition from the LCD makers, whose products are inherently flat and currently very fashionable. The argument that Sony and Mitsubishi put forward is that a flat screen reduces distracting reflections, boosting

productivity and lessening fatigue because the processing centres of the



▶ **SONY'S FLAGSHIP MONITOR, THE GDM-F500**

brain are not so busy filtering out unwanted information. In principle this is sound, although we have to say that the former argument is more likely the real reason. But there is definitely something about a flat screen which appeals to most people once they have



▲ **THE VISION MASTER PRO 450, A SUPERB 19IN DISPLAY**

used one for a while, and of course it won't be too long before the price premium, which is not too bad anyway, comes

down. Whatever the theoretical pros and cons though, there is no arguing that the two monitors we have tested this month which sport Diamondtron NF tubes, the Mitsubishi 900u (reviewed on page 186) and the Iiyama Vision Master Pro 450, are both superb 19in displays.



▶ **The Iiyama Vision Master Pro 450**, sporting a 19in Diamondtron NF tube, is an impressive piece of work. Both vertical and horizontal resolution are superb, rendering single-pixel lines in our test patterns with pin-sharp definition. The technical challenges of flatscreen CRTs have not been totally overcome though, with slight convergence difficulties at the edges of the screen where it is hardest to accurately place the electron beams. There was some evidence of ghosting, too, but the 450 is still a superb display.

★★★★★

▶ **Sony GDM-F500.** The success of the flatscreen CRT and the extent to which CRT technology in general has been refined is best shown in this, Sony's flagship monitor. It has a 21in FD Trinitron tube and the clarity of the images it is capable of producing is quite remarkable. Its aperture grille pitch is just 0.22mm and the electronics are able to drive the unit at a resolution of up to 1880 x 1440 at 80Hz, beyond the capability of most current graphics cards. At a more sensible setting of 1600 x 1200 the picture is nearly flawless and makes up for the slightly disappointing performance of the other two Sony displays we've looked at this month. Not surprisingly, the GDM-F500 is rather a large beast. At 32kg it practically has its own gravitational field. The case itself is not very pretty but one look at the image quality brings home the fact that CRTs are a long way from being trounced by LCD flatpanels.

★★★★★

• **Prices Sony GDM-F500: £1,526.33 (£1.299 ex VAT). Iiyama Vision Master Pro 450: £511.13 (£435 ex VAT)**

# Display technologies

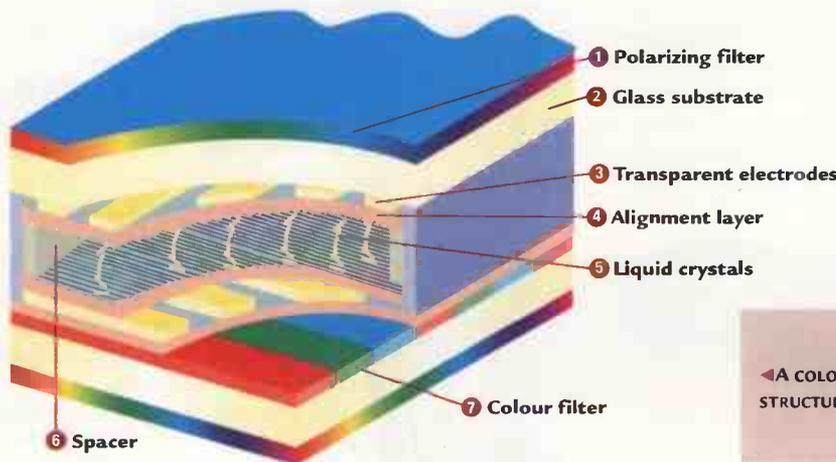
Choosing the right monitor is more complicated than just choosing a spec and hoping you like the picture it produces. Quality is a prime consideration, but so also is the kind of monitor you like. Do you choose a 17in CRT or do you need a larger size? Are you tempted by a TFT? To help you choose the right monitor, we tell you everything you need to know about the technology behind each spec so you can make an informed buying decision.

## CRT displays

The theory behind cathode ray tubes (CRT) is simple yet actually a little bizarre when you think about it. The first thing that's required is a partially evacuated glass tube with a coating of phosphor at one end. At the opposite end is an arrangement consisting of a heating

element and a metal grid (called the cathode) which, when heated, will start to liberate electrons due to their increased energy levels. These electrons are then attracted to a very high voltage anode near the front of the tube. Between the anode and the cathode in the neck of the tube lies an arrangement of electromagnets which focuses the stream of electrons into a beam. Due to their enormous speed — around one tenth the speed of light — the electrons overshoot the anode and hit the phosphor coating briefly fluoresce at the point where the beam hits. If the beam is

steered correctly, by varying the strength of the electromagnets, and scanned from left to right while varying its intensity, a picture can be built up row by row out of the glowing dots of phosphor. To build up a colour picture requires three of these beams, each illuminating different kinds of phosphor which fluoresce with red, green or blue light. To make the beam's transition between adjacent pixels as clean as possible, there is a very fine mask in front of the phosphor. The traditional type of mask is called a shadow mask and consists of a sheet of alloy with extremely fine holes in it.



◀ A COLOUR LCD STRUCTURE

there's no masking in the vertical direction, more light is let through to enable a brighter, more vivid picture. Since the advent of Trinitron, other manufacturers have developed their own versions of aperture grille technology.

**The drawback of aperture grilles** is that they require two fine horizontal wires to damp out vibrations in the grille. These can *just* be seen if you look closely at the top and bottom thirds of an aperture grille screen. The extremely high voltages flying around inside a CRT's casing has led to fears about electromagnetic radiation

and its long-term effects on health. This produced a number of emissions standards, the most stringent being TCO 92, TCO 95 and TCO 99. The overwhelming opinion of the experts is that as long as your monitor conforms to the TCO 92 standard (or the older MPRII) you have nothing to worry about. TCO 95 and 99 are no stricter than TCO 92 where emissions are concerned.

**LCD displays work** because liquid crystal acts as a polarising filter in conjunction with a second, passive polarising layer. The liquid crystal elements of each pixel are arranged so that in their normal state (with no voltage applied) the light coming through the passive filter is 'incorrectly' polarised and thus blocked. But when a voltage is applied across the liquid crystal elements they twist by up to ninety degrees in proportion to the voltage, changing their polarisation and letting more light through.

must be discarded. This leads to a high wastage rate and is the main reason for the high price of TFT displays. It's also the reason why in any TFT display there are liable to be a couple of 'dead' pixels where the transistors have failed.

The transistors control the degree of twist and hence the intensity of the red, green and blue elements of each pixel forming the image on the display.

**LCD flatpanel technology** has numerous advantages. Firstly, because each pixel is in a fixed position and not reliant on an imprecise beam scanning the screen, LCDs provide an extremely sharp image with perfect geometry. The fact that the entire area of an LCD's screen can be used means that a 15.1in LCD has almost the same viewable diagonal as a 17in CRT.

Flatpanels are not called that for nothing: most are no more than a couple of inches deep, saving a great deal of desk space and looking extremely chic into the bargain. Furthermore, because high voltages are not required, LCD displays are safer, consume less power and run cooler than CRTs.

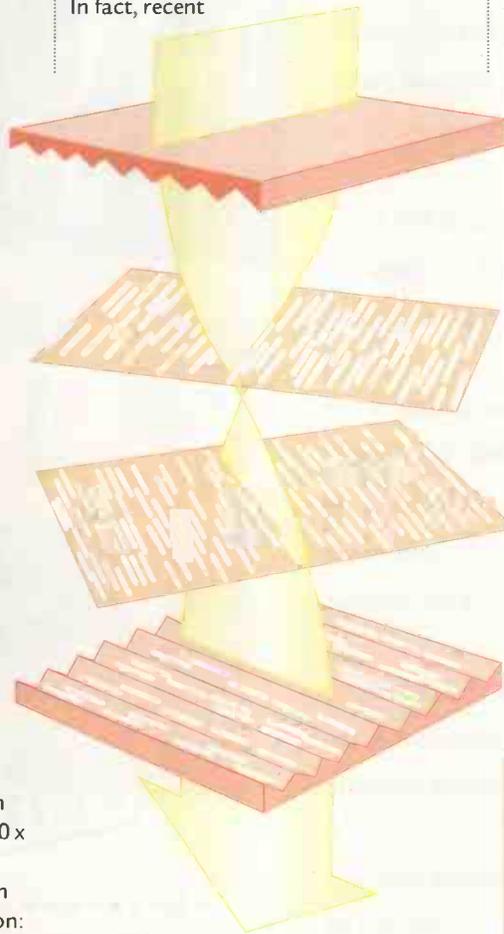
## Resolutions and refresh rates

The analogue nature of the electron beam in CRTs means that they can be steered and pointed anywhere on the screen, enabling them to have a stab at displaying any resolution up to the limit of their amplifier electronics. As electronics have advanced, even low-end 17in displays are now capable of being driven at resolutions which a couple of years ago were reserved for the most expensive 21in units. Many 17in CRTs can now be driven at up to 1600 x 1200 pixels. However, only the most sadistic individuals would want to run a 17in display at such a high resolution: apart from the shadow mask or aperture grille not being fine enough to display that many pixels, text and icons would simply be too small. For most people, the optimum resolution of a 17in display is 1024 x 768.

With a higher-end unit you can get away with 1280 x 1024 but that's best reserved for 19in screens.

With LCDs, the story is different. The fixed pixels of a flatpanel make it hard to display lower than native resolutions without aliasing distortion, and impossible to display higher. This is a major limitation of flatpanels. For CRTs, vertical refresh rate is very

important. Remember that a CRT uses a single beam — or more specifically, three convergent beams — which constantly scans from top to bottom. If it scans too slowly, the eye perceives the scanning as fatigue-inducing flicker. For 14in and 15in displays, the magic number at which most people cease to be able to see flicker is 72Hz (cycles per second). For 17in CRTs, this increases to 75Hz. Nineteen and 21in displays ideally need to be refreshed at 85Hz. Above this level you won't see any benefit. In fact, recent



drive the monitor at an appropriate resolution. This is largely a function of the card's RAMDAC, the part that converts the digital frame buffer into an analogue video signal. Generally speaking, the higher the RAMDAC frequency, the higher the card's maximum resolution and refresh rate.

## Which is best?

LCDs certainly aren't superior to CRTs in every respect. For a start, there are no commercially available flatpanels that can run at 1600 x 1200 resolution or above, whereas the best CRTs can now manage 1800 x 1440. Also, the colour rendition of flatpanels cannot currently match the vibrancy of a decent aperture grille CRT. In addition, the colour depth of most panels is limited since each transistor is driven digitally by a 6-bit signal. This only provides 18-bit or 262,000 colours as opposed to the infinite range of which an analogue monitor is capable — 24-bit true colour is emulated in most panels by modulating pixel intensity.

You might think it strange that since most LCD displays are driven by a digital signal, they are fed an analogue signal from the graphics card which was originally digital. You're right, it's absurd, but the huge installed base of analogue graphics cards means that we're stuck with it for now.

The standards war currently raging over digital panel links makes the VHS vs Betamax battle look like a vicar's

◀ **LIGHT TURNS THROUGH 90° AS IT FOLLOWS THE TWISTED ALIGNMENT OF MOLECULES**

research has suggested that going up to around 100Hz possibly leads to problems of its own, as eye movement can create 'interference' which reduces

***Eye movement can create 'interference' which reduces the speed of visual perception***

the speed of visual perception. LCD flatpanel owners will find that flicker is not

an issue. A panel's backlight refreshes at tens of kilohertz, so the frequency of the video signal itself is irrelevant.

When setting resolutions and refresh rates, bear in mind that the monitor is only half the story. Your graphics card needs to be of high enough quality to

tea party. Suffice it to say, there's no universal standard on the horizon.

**A further disadvantage** of flatpanels is the slight time lag as the liquid crystal elements twist and untwist, resulting in smearing of fast-moving animated objects, although with TFT displays this phenomenon is far less obvious than with previous passive matrix technologies.

Finally, and ironically, the imperfect definition of CRTs can often be an advantage, reducing discernible pixellation and making them more suitable for photographic and artwork reproduction. For these reasons, many people still prefer CRT monitors.

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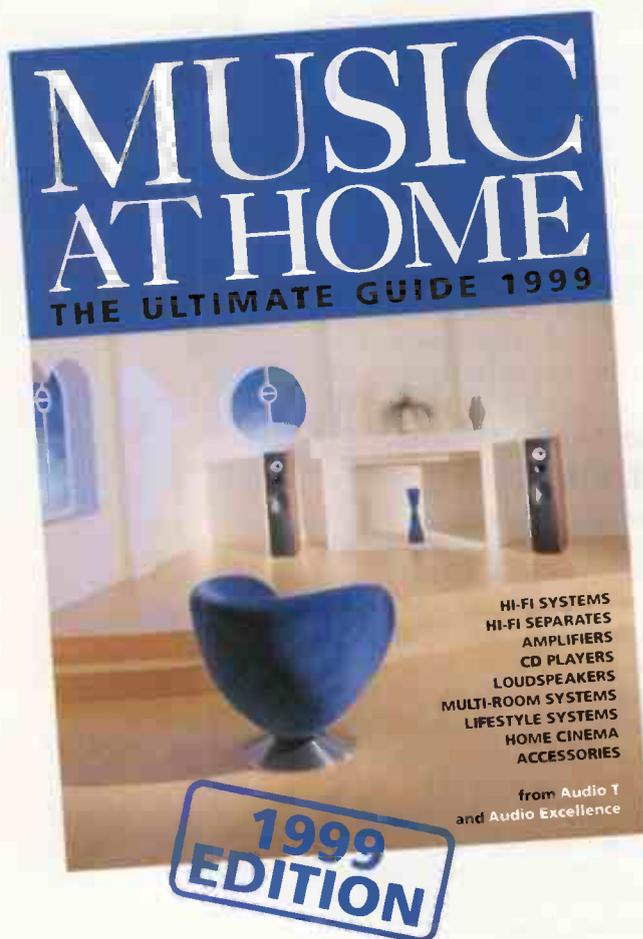
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AND NOT AS OTHERS  
WOULD HAVE YOU BELIEVE**

## • TFT flatpanels

## Iiyama Pro Lite 46a



there's no auto adjust option.

The largest flatpanel on test, at 18.1in, the Pro Lite 46a will display an impressive maximum resolution of 1280 x 1024. It has one novel feature: the display can pivot on its base through ninety degrees, letting you work in portrait mode. It also features four USB ports and, surprisingly, high-quality stereo speakers in the base. Image quality is high, with an excellent viewing angle. The three-button OSD is hard to use though, and

★★★★

## NEC MultiSync LCD 1500M



volume and mute functions. One of the best displays here.

The NEC is an attractive panel and its beauty is not just skin deep. Switching it on at its native resolution of 1024 x 768 produced a crisp, sharp display with bright and vibrant colours. The viewing angle was very impressive too, and the fast response time of the LCD almost eliminated smearing. The OSD is easy to use, with an auto adjust which actually worked. Rounding off the package are four USB ports and stereo speakers, with front-panel buttons for

★★★★★

## Panasonic PanaFlat LC50S



something which cannot be said of some of the other panels in this group test.

The Panasonic looked remarkably familiar when we unpacked it. In fact, it turned out to be the same display as the NEC 1500M [above], with cosmetic changes. But that's no bad thing, since it's a superb display demonstrating all the advantages of the NEC.

The four USB ports add to its appeal, and the auto adjust option in the OSD produced a perfectly adjusted picture —

★★★★★

## Philips Brilliance 151AX



a very reasonable price.

The Brilliance gives a good account of itself in the quality stakes with a vibrant, sharp display. But the viewing angle is not quite as good as the NEC and Panasonic displays, and some streaking effects were present in our tests, although they wouldn't be too noticeable in everyday use. The Brilliance features stereo speakers but a USB hub is an optional extra, fitting into a bay at the back. Overall, this is a good display at a

★★★

MANUFACTURER/MODEL	Iiyama PRO LITE 46A	NEC MULTISYNC LCD 1500M	PANASONIC PANAFAT LC50S	PHILIPS BRILLIANCE 151AX
Price (ex VAT)	£2,239	not supplied	not supplied	not supplied
Approx street price (ex VAT)	Not available	£647	£690	£585
Tel	01438 745482	0645 404020	0500 404041	0181 689 4444
URL	<a href="http://www.iiyama.co.uk">www.iiyama.co.uk</a>	<a href="http://www.euronec.com">www.euronec.com</a>	<a href="http://www.panasonic.com">www.panasonic.com</a>	<a href="http://www.monitors.philips.com">www.monitors.philips.com</a>
Visible diagonal	18.1in	15in	15in	15.1in
Panel type	TFT	TFT	TFT	TFT
Max horizontal frequency	80kHz	61kHz	61kHz	61kHz
Max resolution	1280 x 1024	1024 x 768	1024 x 768	1024 x 768
Connections (BNC, DSub)	D-SUB	D-SUB	D-SUB	D-SUB
Dimensions (WxHxD)mm	471 x 466 x 220	385 x 391 x 200	385 x 391 x 200	402 x 418 x 176
Weight	9.5kg	7.1kg	7.1kg	5.5kg
Power consump max / suspend	70W / 4W	55W / <5W	55W / <5W	<38W / <5W
Other OSD features	clock, phase, colour temp	colour temp, auto adj, volume, clock, phase	colour temp, auto adj, volume, clock, phase	volume, clock, phase, colour temp
Other features (USB etc)	panel rotation, USB (1 upstr, 4 downstr)	front panel mute, volume, speakers, headphone, USBx4	front panel mute, volume, speakers, headphone, USBx4	microphone, speakers, headphone, mute
Standards compliance	TC099	TC095	TC095	TC095

Table of features



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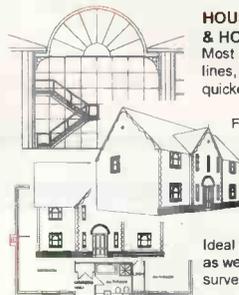
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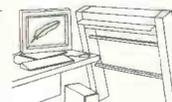
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## • TFT flatpanels

## Samsung SyncMaster 520TFT



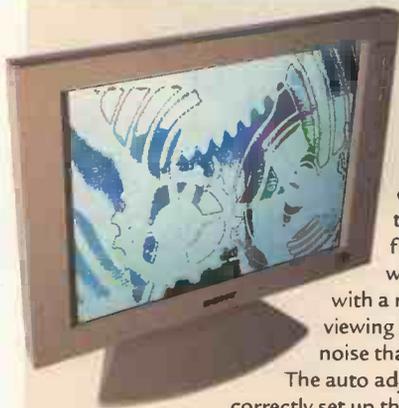
The only word we can use to describe the Samsung panel is 'disappointing'. Although it has decent looks and integrated speakers, the all-important area of image quality is sadly lacking. The problems manifest themselves as poor contrast, a lack of sharpness, and a general lacklustre look to images in comparison with the competition, which no amount of fiddling with the controls would correct. It seems that the unit's analogue-to-digital conversion circuitry is not up to scratch. We wouldn't go for this one. ★★

## Silicon Graphics 1600SW



The highest-resolution flatpanel currently available, the 1600SW will display a fabulous 1600 x 1024 pixels in a wide aspect format, although the Iiyama Pro Lite 46a [p193] has a larger screen area overall. The 1600SW is a serious object of technological desire. Although image quality is superb, it isn't perfect; not quite as bright as the Iiyama, NEC or Panasonic panels. It's the only panel available with an adjustable white point, and it comes with a colour calibration sensor and dedicated Number Nine graphics card for its digital link. ★★★★★

## Sony CPD-L150



Although Sony has a huge reputation for its CRT monitors (see the 420GS and GDM-F500 reviews on pages 186 and 189), the company doesn't seem to have too much expertise with flatpanels. The CPD-L150 was rather disappointing, with a relatively restricted viewing angle and some display noise that we couldn't correct. The auto adjust button failed to correctly set up the display and the unit features neither USB nor audio facilities. And, with the relatively high price, we cannot recommend the CDP-L150. ★★

## Taxan CrystalVision 660TCO95



The Taxan was characterised by its pin-sharp pixel definition. It looked more like a digitally linked panel à la Silicon Graphics than one with an analogue interface. It had a few faults though, with slight but noticeable variations in brightness across the screen, only an average viewing angle and a slightly tricky OSD. The price is also a bit of a sticking point, but if you can find it cheaper, it's a good display overall and well worth consideration nevertheless. ★★★

MANUFACTURER/MODEL	SAMSUNG SYNCMASTER 520TFT	SILICON GRAPHICS 1600SW	SONY CPD-L150	TAXAN CRYSTALVISION 660TCO95
Price (ex VAT)	£949	£1,920	£999	£1,199
Approx street price (ex VAT)	£869	£1,920	£999	£1,139
Tel	0800 521652	07000 320540	0990 424424	01344 484646
URL	<a href="http://www.samsungelectronics.co.uk">www.samsungelectronics.co.uk</a>	<a href="http://www.sgi.com">www.sgi.com</a>	<a href="http://www.sony.com">www.sony.com</a>	<a href="http://www.taxan.co.uk">www.taxan.co.uk</a>
Visible diagonal	15in	17.3in	15in	15in
Panel type	TFT	TFT	TFT	TFT
Max horizontal frequency	61kHz	n/a (digital link)	70kHz	61kHz
Max resolution	1024 x 768	1600 x 1024	1024 x 768	1024 x 768
Connections (BNC, DSUB)	D-SUB	36-pin OpenLDI connector	D-SUB	D-SUB
Dimensions (WxHxD) mm	471 x 466 x 220	454 x 467 x 187	398 x 366 x 165	392 x 374 x 160
Weight	9.5kg	7.2kg	5.3kg	5.3kg
Power consump max / suspend	70W, 4W	<30W / <8W	<35W / <4W	30W / <8W
Other OSD features	clock, phase, colour temp	control via software	zoom, colour temp, backlight, auto adjust, clock, phase	clock, phase, colour temp
Other features (USB etc)	speakers, volume control	automatic colour calibration	-	front panel screen adjust button
Standards compliance	TCO95	TCO95	TCO95	TCO95

Table of features

# Editor's Choice

There's no doubt that while they are not as fast-paced as some other areas of the computing world, monitors are still improving. A large measure of the thanks for this goes to the competition from LCD panel makers, who have given the CRT manufacturers a bit of a kick up the backside. When you think that three or four years ago, a decent 17in CRT monitor would have set you back at least £1,000, and it wouldn't have been as good as today's best 17in units costing just £250-£300, you realise that it really is a buyer's market.

The LCD industry is looking strong and prices are coming down, too. But watch out: the disastrous events surrounding Far Eastern economies mean that after a production glut, panels are predicted to be in short supply this year, so prices may rise.

**Should you choose** an LCD panel or a CRT? We'd say that fashion has tended to cloud people's judgement. CRTs definitely represent

the best value as well as being just as good if not better than LCDs for most uses provided you get a decent one. One thing is for certain: if you're buying a CRT, there's no

panel, it's that little bit cheaper and the quality is superb for the price.

#### Highly Commended is

**Iiyama's Pro Lite 46a.** An expensive panel but its high resolution, attractive design, USB ports and screen rotation feature make it a great choice for the high-end user.

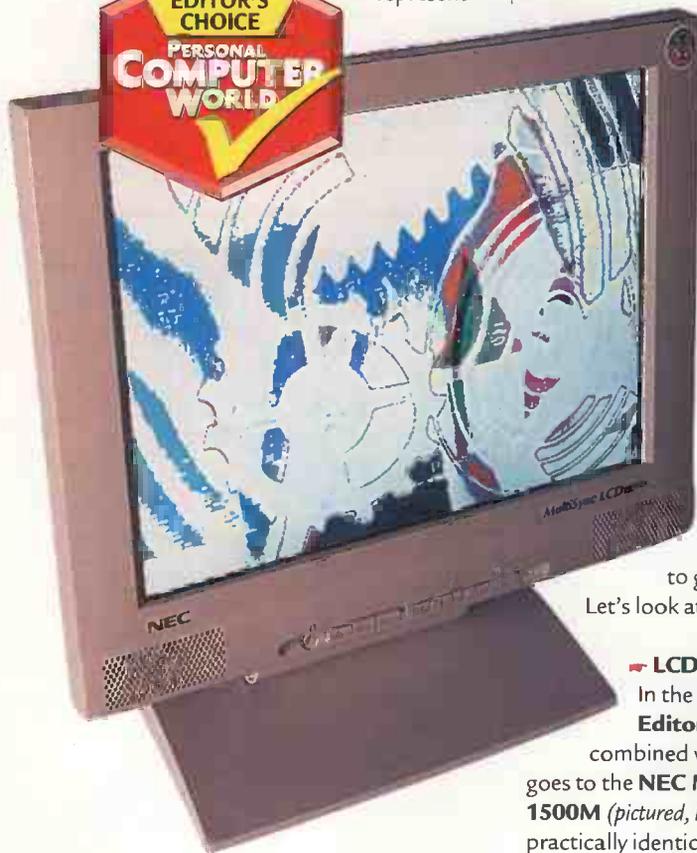
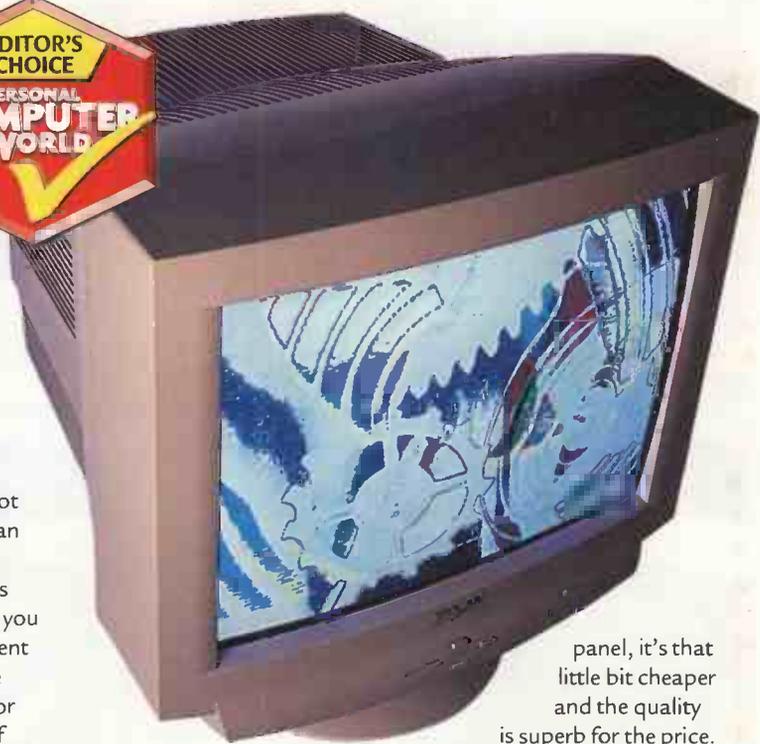
#### → CRT screens

When it comes to the CRTs, we felt the 17in units had the edge over the 19-inchers in terms of value for money, and the quality of the best was simply superb. Best of all is the **CTX PR710T** (pictured, above), our **Editor's Choice**. The clarity of the display and the colour reproduction from its Trinitron tube was brilliant in both senses of the word.

Only fractionally behind the CTX in the quality stakes is **ADI's GT56** which is **Highly Commended**. Its colour rendition was particularly good, and it has those USB ports to its credit.

And finally, even though it is extremely expensive for a CRT, we could not ignore **Sony's GDM F500** for all-out high-end quality. It, too, comes **Highly Commended**.

◆ Our thanks to Atlantic for providing the test systems for this round-up of monitors.



point in going for anything less than a 17in unit. It's a false economy, and your eyes and brain will benefit no end from choosing one of our winners rather than a cheap-and-nasty 15-incher. A 19in CRT is a luxury, but research has suggested that they do little to improve productivity. So unless you really need to run at a resolution higher than 1024 x 768, it's not absolutely necessary to go for a 19in display.

Let's look at the overall winners:

#### → LCD panels

In the LCD panel stakes, our **Editor's Choice** for quality combined with value for money goes to the **NEC MultiSync LCD 1500M** (pictured, left). Although practically identical to Panasonic's

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Chipset	Intel 440LX	Intel 440LX	Intel 440BX	Intel 440BX
Memory	64Mb SyncDRAM	64Mb SyncDRAM	64Mb (Fast 100MHz) SyncDRAM	1x128Mb (Fast 100MHz) SyncDRAM
Hard disk	Seagate 8.4Gb	Seagate 8.4Gb	Fujitsu 10.0Gb	13Gb Western Digital
CD-ROM	Panasonic 32x CD-ROM	4x Hitachi DVD-ROM Drive	5x Hitachi DVD-ROM Drive	5x Hitachi DVD-ROM Drive
Graphics card	8Mb ATI Rage Pro 2D/3D	8Mb ATI Rage Pro 2D/3D	8Mb ATI Rage Pro 2D/3D	16Mb nVidia TNT Riva 2D/3D
Monitor	15" SVGA Colour	15" SVGA Colour	15" SVGA Colour	15" SVGA Colour
Modem	US Robotics v.90 56k Strangler	US Robotics v.90 56k Strangler	US Robotics v.90 56k Strangler	US Robotics v.90 56k Strangler
Sound	64 bit Creative Labs Soundblaster	64 bit Creative Labs Soundblaster	64 bit Creative Labs Soundblaster	64 bit Creative Labs Soundblaster
Operating system	Windows 98	Windows 98	Windows 98	Windows 98
Software	SmartSuite Millenium with ViaVoice, FIFA 99, IBM World Books 99 and many more.	SmartSuite Millenium with ViaVoice, FIFA 99, IBM World Books 99, DVD Player Software and much more.	SmartSuite Millenium with ViaVoice, FIFA 99, IBM World Books 99, DVD Player Software and much more.	SmartSuite Millenium with ViaVoice, FIFA 99, IBM World Books 99, DVD Player Software and much more.
Expansion slots	1x AGP Slot (used) 4 x PCI slots (used) 3 x ISA slots	1x AGP Slot (used) 4 x PCI slots (used) 3 x ISA slots	1x AGP Slot (used) 5 x PCI slots (2 used) 2 x ISA slots	1x AGP Slot (used) 5 x PCI slots (2 used) 2 x ISA slots
1 Years On-site Service	FREE	FREE	FREE	FREE
Model	8270	8272	8596	8710
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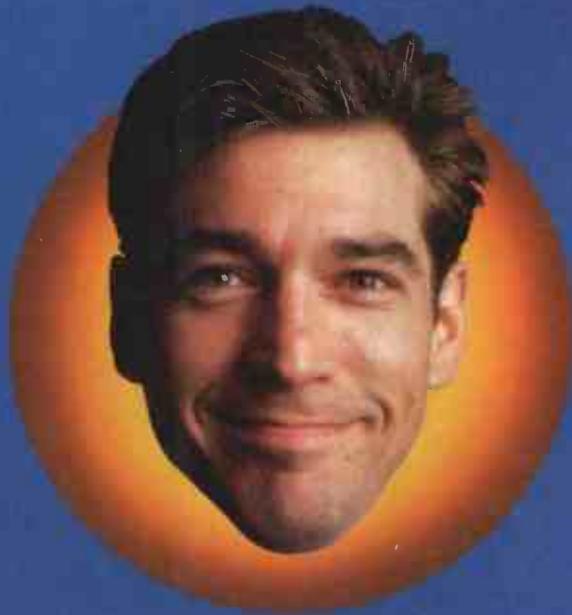
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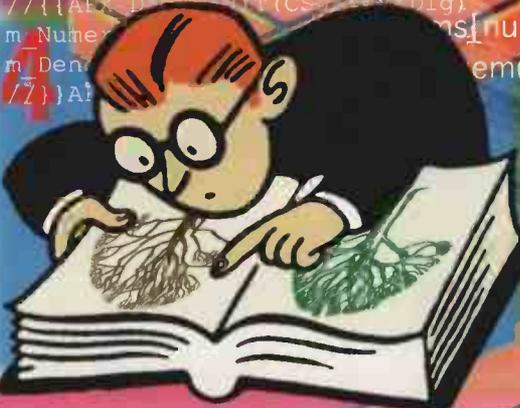
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group test

```
user tool prompt
Call VCSetUserTool(1, "SUFText", "Check Starting Page")
End Sub
```

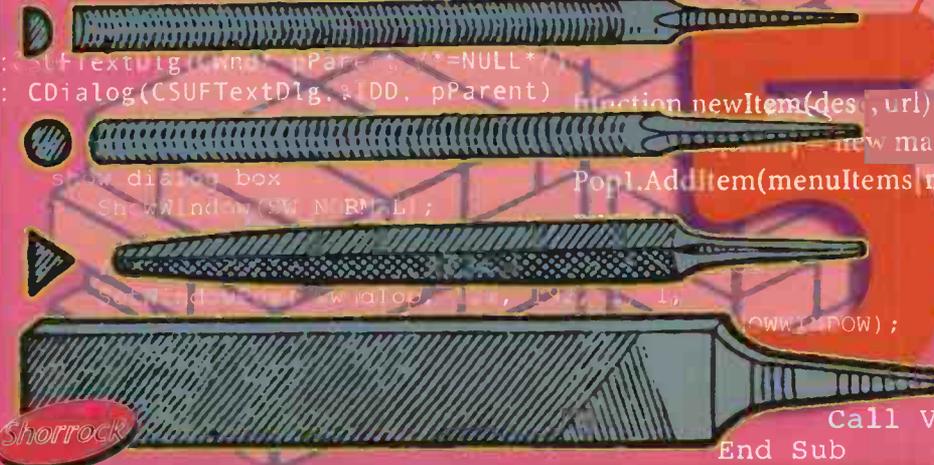


```
function newItem(
desc, url)
m_Num = m_Items[num] - 1
m_Desc = desc
m_Url = url
m_Items[m_Num] = newItem(desc, url)
End Function
```

desc, url) <-- create a small 'page' object  
<-- add that page's description to the popup control

```
function makeItem (desc, url) {
this.desc = desc;
this.url = url;
}
```

new makeItem(desc, url) <-- create a small 'page' object



Shorrock

```
function newItem(desc, url) {
this.desc = desc;
this.url = url;
}
Pop1.AddItem(menuItems[num], desc)
ShowDialog(ShowWindow(SW_NORMAL));
```

new makeItem(desc, url) <-- create a small 'page' object  
Pop1.AddItem(menuItems[num], desc) <-- add that page's description to the popup control

```
Call VCSetUserTool(1, "SUFText", "Check Starting Page")
End Sub
```

# Task masters

**C**hoosing the right tool for the job in hand is vital for successful programming. Here, we have taken six leading products and analysed their suitability for three different tasks. First we have looked at creating a simple text editor. Next up is developing an all-action game, and finally comes a web-enabled address book application. The chosen products include

Illustration by PAUL SHORROCK

three Windows development tools and three for Java. First for Windows is Microsoft Visual Basic 6.0, the latest version of the pioneering visual development tool and the most widely used programming product. Second is Microsoft Visual C++ 6.0, demanding to learn but powerful. Third comes Inprise Delphi 4.0, the package that, when first launched, stunned developers by combining VB's ease of use with the speed

of natively compiled code. The Java lineup begins with Inprise JBuilder 2.0, which aims to bring Delphi's productivity to Java. Next comes IBM's VisualAge for Java 2.0, which does true visual programming and has a built-in code repository. Finally, Visual Café 3.0 is the market-leading Java development tool from Symantec, one of the first to release a full-featured integrated development environment for Java.

TIM ANDERSON

## What is Visual Programming?

Most programming languages are text-based. You write the code in English, and then run some sort of compiler to convert your code into a form the computer can actually execute. To save time and reduce errors, modern development tools do some of this work for you. For example, it would be tedious to position buttons on a form by counting pixels, so instead you can use a graphical form designer to place and size them with the mouse.

**Most packages** take this a stage further, letting you link text boxes to database fields, or create an event handler to define what happens when you click a button, without having to write the code yourself. A key concept is the property sheet, which lists the properties of a visual or non-visual object and lets you select or type-in values.

**Development tools** that offer these features are called visual programming tools, although purists use the term in a slightly different way. True visual programming lets you draw the logic as well as the appearance of an application. SmallTalk is often programmed this way, but it has never caught on in the mainstream. The closest example in this

round-up is IBM's VisualAge. The other products are hybrids, environments that offer visual assistance but which still leave you looking at a flashing text cursor to create the code that drives the interface. Even then, some are more visual than others. The least visual of the products featured here, despite its name, is Microsoft Visual C++, replete with wizards but firmly text based.

Although visual programming does boost productivity, there are disadvantages. In Java's case, the visual tools have struggled to keep up with the pace of Sun's changes to the JDK, the most recent example being compatibility problems with JDK 2 (formerly 1.2). Some developers get round this by using the straight JDK along with their favourite programmer's editor.

Another problem with visual programming is that the environment and class library often adds unnecessary code, to allow for features that you may not want to use. If you want to build the

smallest possible Windows application, for example, forget MFC or Delphi's VCL and do it the old way with plain C. In the real world though, productivity usually counts for more than raw performance.

*In the real world, productivity counts for more than raw performance*

features. It is also a good fit for CORBA, an architecture for distributed objects, giving

## What is Java?

Java began in 1991 as a Sun Microsystems project for embedded systems. It is based on two concepts. The language has a family resemblance to C++, but is both simplified and enhanced to make it safer and more object orientated. Second, it compiles not to native code but to an intermediate form that runs on an interpreter called the JVM (Java Virtual Machine). Sun realised that Java was ideal for apps that run in web browsers, and in 1996, when Netscape Navigator 2.0 included the ability to run Java applets, interest in it soared.

There are several factors behind Java's popularity. First, it is a well-designed language that is more productive than older rivals like C++. Second, Java's cross-platform talents make it a rallying point for anyone in the industry who would like to dislodge Windows from desktop dominance. Third, Java is a web-aware platform with built-in security and comms

both technologies a mutual boost. Fourth, things are turning full circle as interest in embedded systems is once again intense.

# Project 1 Text editor

**A** new text editor is a revealing project for a test. It's a good starting point for any application that handles documents, and includes features like menus, toolbars, and printing functions. Following the latest trend, we decided to create SDI (single document interface) editors, with at least the ability to open, edit, save and print.

**Visual Basic** gets off to a cracking start with its Application Wizard. You can pick an application style, check the menu and toolbar options you want, and optionally embed a web browser into the application. The wizard application looks good, but selecting an option simply displays a 'to-do' dialogue.

It is not hard to finish the job. Rather than stick with simple text, right-clicking the toolbox lets you add a rich-text ActiveX control. To get this to fill, the client area required a few lines of code in the form's resize event handler. The File -

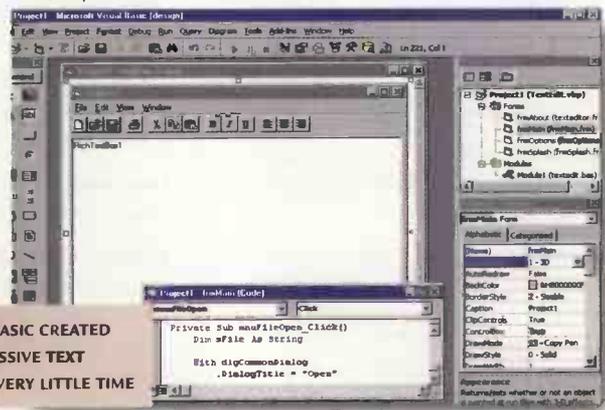
Open menu already displays an open dialogue, and one additional line of code loads the chosen file into the editor.

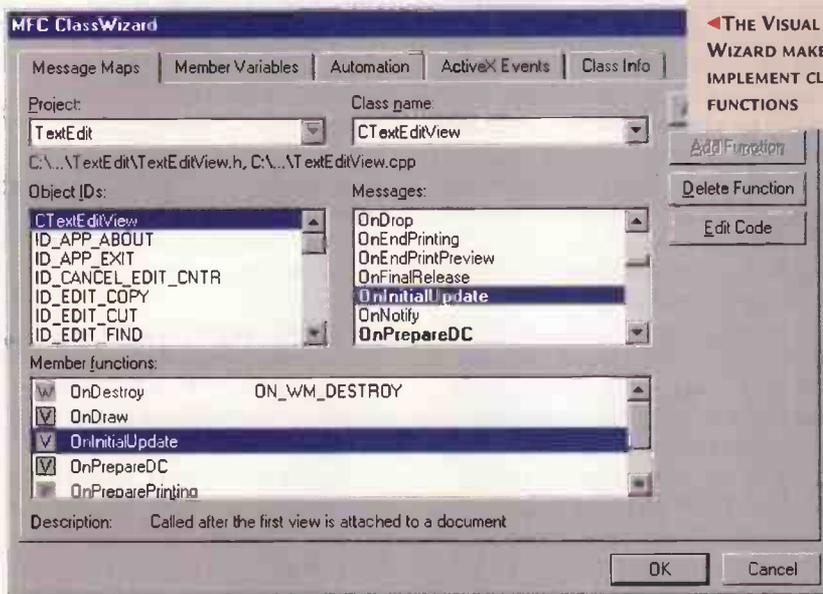
Save is nearly as easy, as is hooking up the bold, italic and underline options. The reason is that all these functions are built in to the rich-text control. The only problem with this kind of black-box development is when you want to modify the behaviour, say to

print a page at a time based on the selected printer. You can do this, but it means diving into the Windows API and writing a substantial amount of code, breaking the illusion of simplicity. Even so, VB is hard to fault for this kind of project.

**Visual C++** has an AppWizard that looks on the surface like the one in Visual Basic but in reality is more sophisticated. I selected an MFC application with an SDI interface again, and with support for the Document-View architecture. This is ideal for an application like a text editor or word processor, as it separates the code which handles the document from that which

**► VISUAL BASIC CREATED THIS IMPRESSIVE TEXT EDITOR IN VERY LITTLE TIME**





displays it on the screen. Unfortunately it is also fairly complex.

A key step in the AppWizard is to change the Base class to the view closest to what is required. I chose the CRichEditView. AppWizard then generated dozens of files complete with an explanatory readme, to make an instant application that had some of the required functionality. For example, you could type in the window, and save and load files.

The Visual C++ interface is very slick, but that does not make it easy to get

started. For example, a natural next step is to change the application's default font from the ugly System font. There is no friendly property sheet for this, so you have to add code, and it is not obvious where to add it. The font is a function of the display, so you might try the OnInitialUpdate method of your View class. Visual C++ makes it easy to find the code, either in the Class View or by right-clicking the code window and choosing ClassWizard.

Next, declare a CFont object, call one of its CreateFont methods, and pass it to

the SetFont method of the View. Visual C++ has excellent pop-up help for the fourteen parameters of CreateFont, although you still need to

look up constants like ANSI\_CHARSET.

Skilled users will find plenty of time-saving features in Visual C++, but this will never be RAD. On the other hand, performance is excellent, and anything you can do in Windows, you can do with Visual C++.

➔ **Delphi 4** has an SDI application wizard which, unlike those in VB and Visual C++, has no options at all but nevertheless builds a sensible frame for an editor, with a menu and toolbar complete with standard functions like open, save, cut, copy and paste. The default functionality is very limited, but adding to it is as simple as in Visual Basic. I dragged a RichEdit control onto the form, and set its alignment to automatically fill the client area, a neat timesaver and one point scored over VB. Next, I hooked up the Open function by adding a call to the LoadFromFile method of the RichEdit control's Lines property.

It helps to know beforehand that the Lines property has this key method. If you look up TRichEdit class in online help, you will not find any method for loading from a file. If you inspect the Text property, you find it is simply a string. How do you find out that the

## VISUAL PROGRAMMING & JAVA JARGON

**ADO** ActiveX Data Objects, Microsoft's latest data access API based on COM.

**API** Application Programming Interface, a set of functions that allow programmatic access to the specified features.

**BDE** Borland Database Engine, used in Delphi and in the DataGateway middleware product.

**Class library** Prewritten code that defines a set of general-purpose objects for use in building applications.

**COM** Component Object Model, Microsoft's specification for local and distributed objects.

**CORBA** Common Object Request Broker Architecture, an industry standard for communication between distributed objects.

**DirectX** Microsoft's API for fast graphics and multimedia programming.

**Embedded systems** Applications embedded into devices other than computers.

**IDE** Integrated Development Environment, the combination of a code editor, design tools, and control over compilation.

**ISAPI, NSAPI** Internet/Netscape Server API, a specification for running code on web servers.

**JavaBean** A Java class designed for visual manipulation in a form designer.

**JDK** Java Development Kit, now sometimes known as the Java Platform, the JVM and core classes for developing and running Java software.

**JET** The database engine used in Access, Visual Basic and MS Office.

**MFC** Microsoft Foundation Classes, the standard C++ class library for Windows.

**ODBC** Open Database Connectivity, a specification for data access mainly used from Windows.

**OpenGL** 3D graphics library developed by Silicon Graphics and available on various computer platforms.

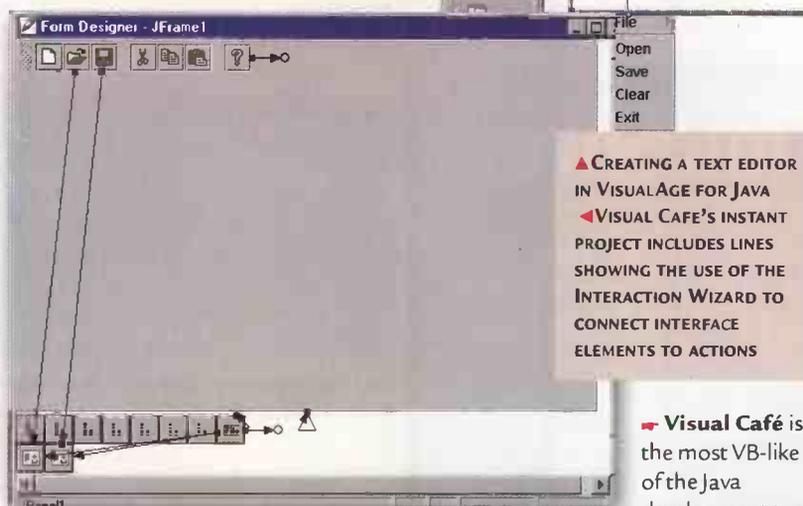
**RAD** Rapid Application Development, using code generation, components and/or a class library to snap applications together quickly.

**SQL** Structured Query Language, an industry-standard way to define database queries and commands.

**VCL** Visual Component Library, Delphi's class library written in Object Pascal.

Lines property, which is a TStrings object, has the feature you need? Threading your way through the documentation is a task that makes Delphi needlessly hard to use.

➔ A project in **JBuilder 2** begins with File - New, which offers a variety of projects, the exact range depending on which version of JBuilder you have. Choose Application, and JBuilder then asks whether you want to use just core JDK classes (including Swing) or whether to use the JBCL, a loose equivalent to Delphi's VCL but based on JavaBeans. You also have options to include a menu,



▲ CREATING A TEXT EDITOR IN VISUALAGE FOR JAVA  
 ◀ VISUAL CAFE'S INSTANT PROJECT INCLUDES LINES SHOWING THE USE OF THE INTERACTION WIZARD TO CONNECT INTERFACE ELEMENTS TO ACTIONS

➔ **Visual Café** is the most VB-like of the Java development tools.

toolbar and about box. JBuilder then built the application, which was a poor thing compared to the slick Windows offerings. A simple frame with a menu and toolbar of just three non-functional options isn't much, but it's a start.

The first task is to add a text area to the frame. I changed its layout manager to BorderLayout and then dropped a JBCL TextArea component onto it, using the Design tab of JBuilder's project manager. It automatically filled the panel.

To load documents, I added a JBCL filer component and an Open menu item. JBuilder creates skeleton event handlers for you, and also pops up parameter help as you type, speeding the work significantly. JBuilder's online help provided a code snippet that reads text from a file, and adding this plus an import for java.io.\* produced a working Open function.

**JBuilder** is a RAD environment a little harder than VB or Delphi, but easier than Visual C++. It's also worth noting that the Swing JEditor component has interesting features like the EditorKit class, letting you use provided file formats like RTF or HTML, or define your own.

It performs better because it is itself a Windows app, unlike most of JBuilder and VisualAge. Help is Windows help, and easier to use than JBuilder's sluggish help viewer. I started with the New Project dialogue and chose a JFC (Swing) application. This was more feature-rich than the JBuilder equivalent, complete with open and save dialogues, and a toolbar with cut, copy and paste options. Lines on the project show the use of the Interaction Wizard, which lets you connect user interface objects to actions using a dialogue. A right-click option lets you edit the Java code manually.

For this editor I used a JEditorPane component and set its Placement property to fill the client area. The open function was hooked up by creating an openFile method to read the file returned by the openFile Dialog component, calling setText from JEditorPane to load the text.

Like the other products in this test, Visual Café has a Code Helper that shows valid methods in a drop-down list as you type. It can also generate an event

handler for you, by selecting it from a combo box at the top of the editor.

Overall though, Visual Café has one of the weaker editors. Unlike JBuilder, there is no way to display a tree view showing the contents of the editor in outline. It is all done from less convenient drop-down combos.

➔ **VisualAge for Java** has a distinctive IDE that offers less immediate help than its rivals. However, it is more helpful than it first appears. If you just add a JFrame class to a package, and then run it, VisualAge will generate the required code for the main method. Next, I opened the frame window in the Visual Composition editor and added a JMenu and a JEditorPane. I set the containing frame to use the border layout, the menu to appear North, and the EditorPane Centre. Adding items to the menu was a matter of dragging JMenuItem beans from the Swing palette to the cascading JMenu. Then a FileDialog was added. VisualAge

lets you connect menu items to code through an innovative Connect feature. Choose

an action such as actionPerformed, then a target action such as calling the show() method of the FileDialog, and VisualAge will generate the necessary code.

VisualAge is a strong RAD environment despite its lack of wizards. The built-in repository is great, except when you want to use any external tools, when it is a matter of exporting and re-importing the code. ➔

## Visual Café is the most Visual Basic-like of the Java development tools

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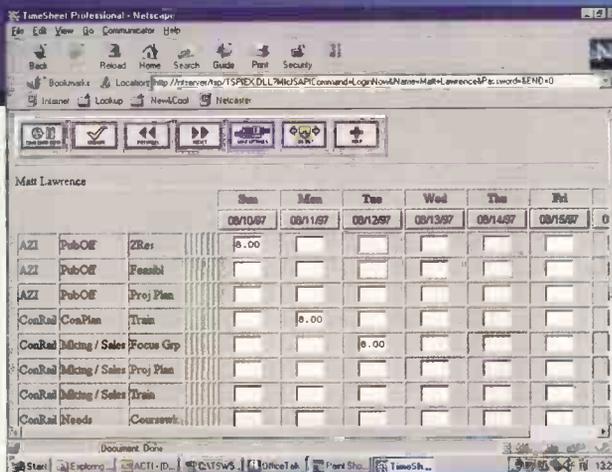
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# Project 2 Developing games

**G**ames are among the most demanding applications. They are also poorly served by many development tools, which are aimed primarily at business users. Strategy games aren't so bad, but fast-action projects are another matter. Games development does not actually lend itself to visual programming, because conventional graphical widgets like buttons and list boxes are not much used.

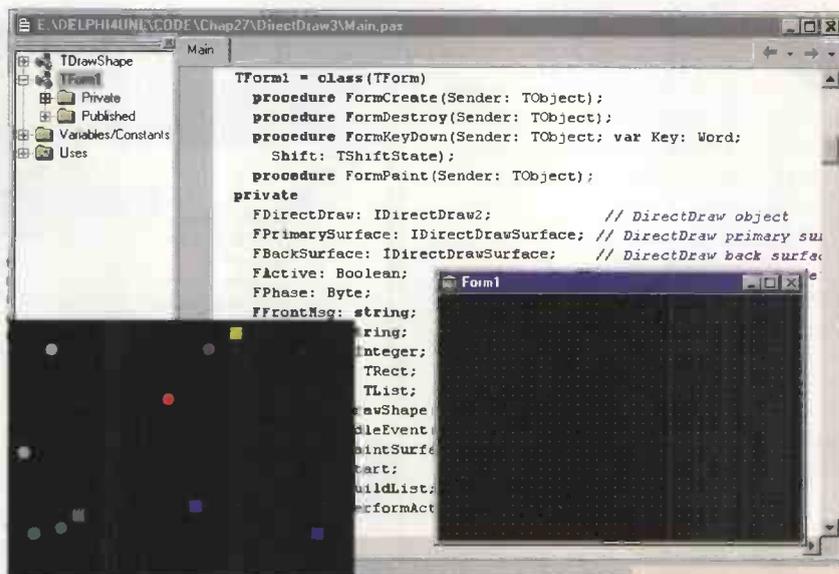
➔ **On the face of it, Visual Basic** has little to offer the games programmer. The reason is that most Windows games development is done using DirectX, which aims to provide a device-independent API for multimedia programming while retaining the performance of direct hardware access. Most DirectX development is done in C or C++. Since most of DirectX is a COM API, it is theoretically possible to use most of it from VB and third-party wrapper ActiveX controls have been produced. There is little advantage though, and the VB runtime is an overhead most games can do without.

➔ **Delphi is more promising** although again Inprise has done little to make things easy. The DirectX API is not wrapped by the Delphi VCL, but third parties have stepped into the breach to create DirectX.pas.

Delphi does include declarations for the Windows OpenGL API. The declarations are all you get, though. No information on using the API is supplied with Delphi.

What this boils down to is that Delphi is well able to support both DirectX and OpenGL, but developers have to suffer the fact that all the documentation assumes use of C/C++. For someone with Delphi skills, it may still be worth using.

➔ **Visual C++ is the natural home** for games developers. Note though that neither DirectX nor OpenGL are part of MFC; many of the features of Visual C++ are therefore not relevant. Visual C++ does have an excellent code editor and browser which, along with the fact that the relevant SDKs are C/C++ based,



makes this the best choice for multimedia coding.

➔ **Despite its performance problems, Java** has multimedia potential. Relevant APIs include Java 2D, for 2D imaging, Java Media Framework, Java Collaboration for real-time multi-player games, Java Animation and Java 3D. This last is a collaborative effort from Intel, Silicon Graphics, Apple and Sun. Java is a high-level API that is intended to scale smoothly as the performance of the

**Which Java product** is best for working with the Java multimedia APIs? Here, there

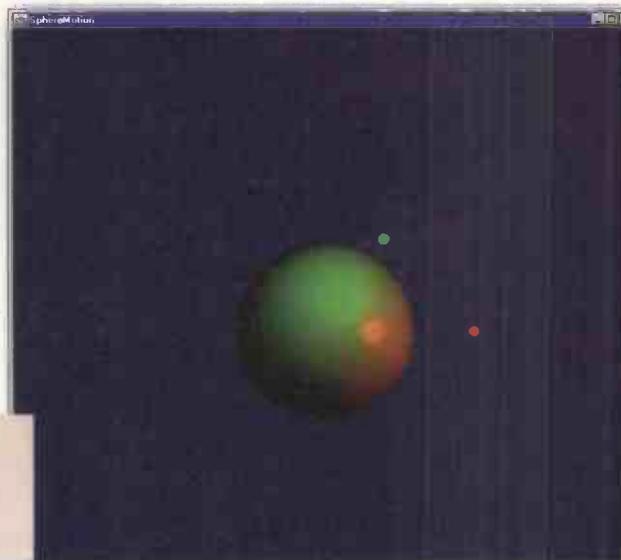
is actually a good case for working directly with the Sun JDK and your favourite code editor. Having said that, the pick of the three products covered here would be JBuilder, thanks to its superior editor. Visual Café comes next, and benefits from a native code compiler, while Visual Age is a poor choice for several reasons. Its editor is nothing special, and the inability to switch to different versions of the JDK counts against it.

▲ **DOING DIRECTDRAW IN DELPHI** — NOTE THE UNEXCITING FORM DESIGN. THE IMAGE AT BOTTOM LEFT SHOWS THE RUNNING APPLICATION

***Visual C++ is the natural home for games developers ... it has an excellent code editor and browser***

underlying hardware improves. Part of the attraction of Java 3D is that it will work in web browsers without needing a plug-in or ActiveX control. The current Windows implementation requires OpenGL support, with a DirectX version in preparation.

▶ **3D GRAPHICS IN JAVA. THIS IS THE SPHERE MOTION EXAMPLE**



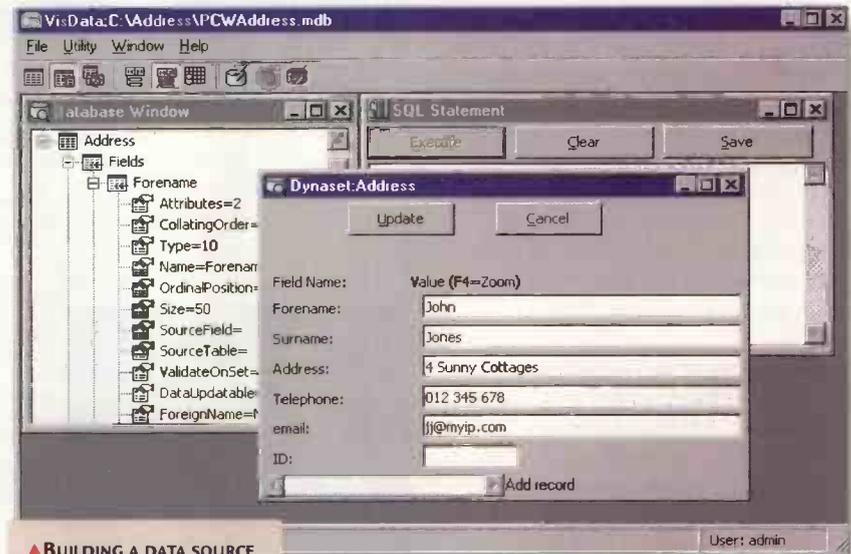
# Project 3 Web database development

**V**isual Basic is stuffed with database features. It includes the same database engine as that used in Microsoft Access. Alternatively you can get at data through ODBC, or through ADO, the newest Microsoft data access API.

The starting point is to define the data source itself, which you can do through VB's Visual Data Manager. Ideally, a web data source should use a client-server database such as SQL Server or Oracle, but for small systems Microsoft Access will do. Using Visual Data Manager you can create and define fields and enter data.

One way to present the data on a web page is through a new feature called WebClasses. In the New Project wizard, choosing IIS Application starts a skeleton project that will run on Internet Information Server. The project opens with little indication of what you should do next, which is to create an HTML template with replaceable tags, and write code to connect to the data and generate HTML in response to browser requests. VB WebClasses get good marks for functionality, but ease of use needs attention.

➤ **Delphi 4 is equally replete** with database tools, particularly in its high-end version. A database desktop utility, essentially a cut-down version of Paradox, lets you create and edit data sources. Delphi's built-in database engine has native drivers for Paradox and dBase as well as SQL links including Oracle, InterBase and SQL Server. Building a conventional Windows application with data access is straightforward, but in this case a web



**▲ BUILDING A DATA SOURCE IN VB'S VISUAL DATA MANAGER**

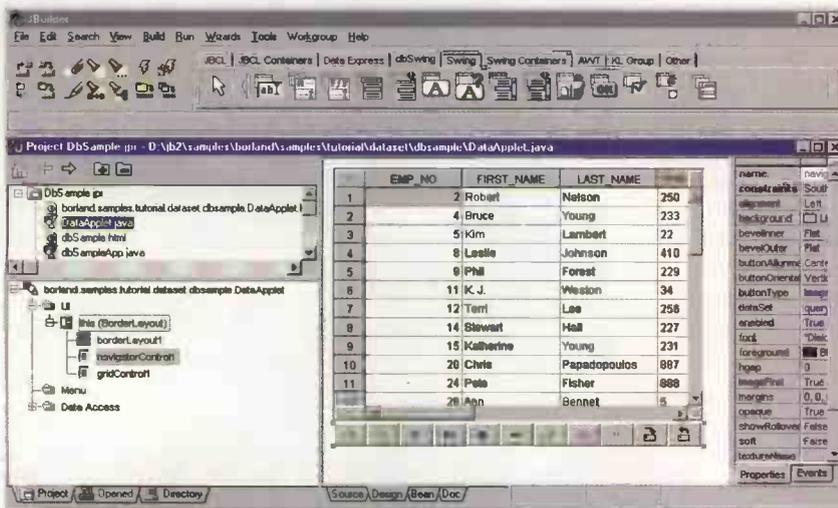
application is needed. Fortunately, Delphi has a great feature for web database development, which is the capability of creating NSAPI or ISAPI DLLs, although you need at least the client-server version. These are code libraries that run on a web server, and they are fast and efficient. For the most scaleable applications you need to consider a fully distributed solution using DCOM or CORBA, but a simple ISAPI DLL will be fine for many organisations.

Delphi has a Database Web Application wizard to get you started. Like VB's WebClasses, it is not really drag-and-drop programming, but it is well designed. TWebRequest and TWebResponse objects encapsulate HTTP requests and responses respectively. These are passed as

parameters to a TWebDispatcher, which processes the request. This can be integrated with a data code module for smooth data access. Deployment is a matter of installing the compiled DLL on the web server, and calling it from web pages with any required parameters added to the URL.

➤ **Visual C++** also has an ISAPI extension wizard, although NSAPI is not supported. The wizard uses MFC classes, including CHtmlServer, CHtmlServerContext and CHtmlStream. Little help is offered, though, over how to use the classes or how to combine them with data access. Having said that, Visual C++ comes bundled with MSDN, which has a section on developing ISAPI extensions. Visual C++ is for those who want extra performance at the expense of rapid development.

➤ **JBuilder is a natural choice** for building a web database application.



**◀ CREATING AN INSTANT DATABASE PROJECT IN JBUILDER**

With an applet or application project open, you can add a database component which will prompt you for a URL that defines

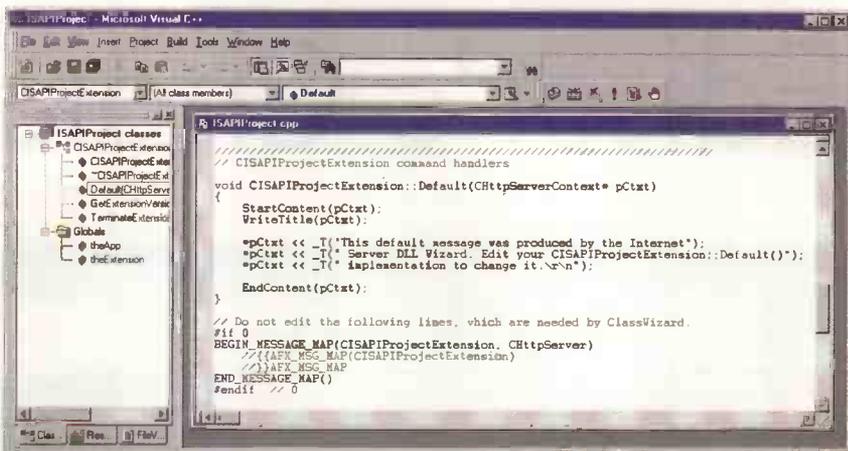
a JDBC database connection. Choices include the Sun JDBC-ODBC bridge, or the DataGateway, middleware that lets you connect to the Borland Database Engine via JDBC or a native JDBC driver.

Next, you can add a queryDataSet component and set its query property to link to the database component, defining an SQL query to determine what data to extract. Finally, adding

data-aware controls such as a grid and data navigator lets you build an instant database application.

Using Java applets is not the easiest way to make data accessible over an intranet or on the web. A server-side DLL such as those Delphi builds will often be quicker and easier to deploy. JBuilder's equivalent would be Servlets, Java components that run on compatible web servers. It is early days for Servlets and I would expect them to be more prominent in the next JBuilder.

➔ **Visual Café** has a database edition. There is a database project wizard and it stepped smoothly through several dialogues to create an applet linked to an SQL Server database. The result not only allows data view and navigation, but also includes a Query By Example button that lets you enter criteria for searching the data. Database components in Visual Café include a connection manager, data navigator, and adapters for using stored procedures, validating data and displaying calculated fields. These work with any JDBC driver. Symantec's solution to overcome the limitations of the JDBC-ODBC bridge is a piece of



**▲ VISUAL C++ DOES ISAPI DLLs, BUT WITH FEW CONCESSIONS TO RAPID DEVELOPMENT**

middleware called dbAnywhere. This has a JDBC driver, the idea being that you connect to dbAnywhere through JDBC, and dbAnywhere then connects to the data using ODBC or its own drivers.

➔ **To use Visual Age** for database work, you need the high-end Enterprise version, unless you are happy to write

your own JDBC data access code. The Enterprise edition includes data access beans. Using these, you can create data access classes for any JDBC data source. IBM provides a JDBC driver for DB2, an IBM server database available on a number of platforms. The Select bean is a non-visual component for making a connection, while the DBNavigator is a visual bean for navigating a dataset.

# Java Futures

**Java, Java everywhere; but where next for Windows?**

Ironically, the one place Java has stalled is where it first succeeded: applets in web pages. They are used to some extent, but web developers are put off by performance and compatibility problems. The excitement is elsewhere. First, the use of Java for distributed applications is soaring, particularly as useful tools emerge. Java applications combined with a CORBA-compliant object broker have great potential, exploited by tools like Inprise Application Server, NetDynamics application server (NetDynamics is now part of Sun) and Apptivity from Progress Software. Second, Java APIs are extending the reach of the platform, for example in multimedia, email and commerce. Third, Java is going back to its roots as a platform for embedded systems.

Personal Java is designed for handheld computers. Jini is a plug-and-play networking system that will let any Java-enabled device easily connect and disconnect. You can expect to see Java in mobile phones, set-top boxes, cars, and

in office and household equipment.

One company not likely to get much advantage from Java is Microsoft, and when it took out a licence to support Java in Internet Explorer, some suspected it would try to fragment the standard. Microsoft has in fact introduced extensions that make Java work with COM and with the native Windows API. It is also understandably reluctant to support newer Java features that compete directly with Windows and with COM, to such an extent that Sun and Microsoft became locked in legal dispute.

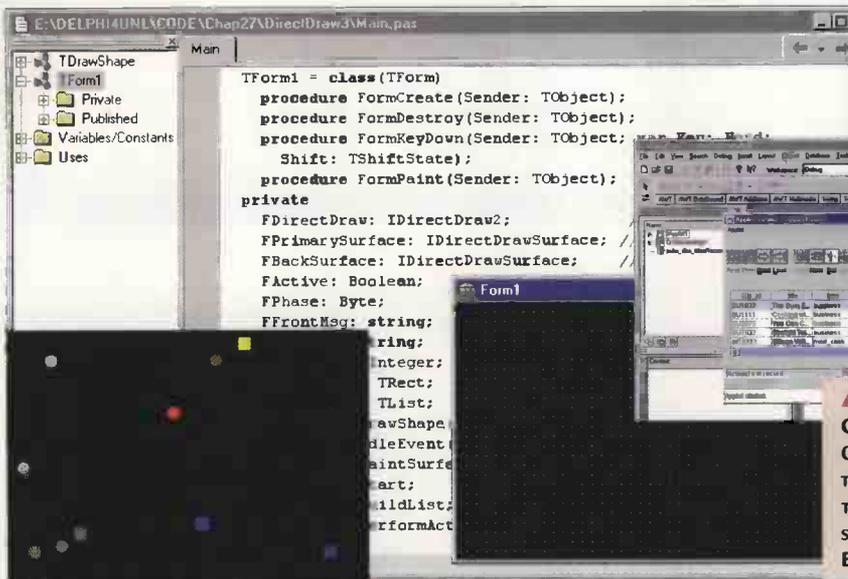
It appears likely that Microsoft's JVM will have to conform with Sun's standards, including the JNI (Java Native Interface), although whether this will mean significant changes to Visual J++, whose class library depends on native calls to the Windows API, is not yet clear. In principle, creating Java apps that depend heavily on native methods is not a breach of Java's specification, but goes against the grain of Java's direction. Even if Microsoft were to drop or freeze Java

support, it will still run on Windows and, through third-party extensions, in Explorer, so the outcome is unlikely to influence Java's progress.

Another Java problem is that its cross-platform ability involves compromise. Java applications are typically less snappy and slick than Windows equivalents: projects like Corel's Java suite have been put on the back burner for performance reasons. A combination of faster hardware and clever compilation and optimisation will solve performance problems, but how soon is unclear.

Finally, there's industry politics. Microsoft will compete as best it can with Java. Other companies are puzzling out the long-term implications of Sun's control over Java: Sun is submitting Java as an ISO standard, but retains ownership of the platform. IBM, Novell, Oracle and Inprise are basing some or all of their future strategy on Java, so one way or another it will be a prominent part of computing as the new millennium unfolds.

# Editor's Choice



provides the best performance and ease of use. A valuable feature is the native code compiler for Windows that helps to wrest brisker results from Java

applications. For everyday use, this is still the Java tool to beat, although its editor and IDE have room for improvement. Visual Café looks less good if you are targeting large-scale distributed applications. For this, JBuilder, with its VisiBroker integration, looks a better choice. Looking at all six tools together, it is apparent

**▲ THE HIGHLY COMMENDED VISUAL CAFE, THE JAVA TOOL TO BEAT ▲ DELPHI, THE BEST OVERALL SOLUTION AND OUR EDITOR'S CHOICE**

This is not a comprehensive group test of VB and Java tools; rather, it's a brief look at how they might be used for three common tasks: a document editor, a game, and a web-enabled database. As an added twist, it is an opportunity to look at Java's suitability for real-world tasks. All the products have something to commend them, but there are clear winners as well.

Only one provides a convincing solution in all three categories. The **Editor's Choice** is **Inprise Delphi**. It is not cross-platform but does let you build browser-independent web applications. It reaches all the way from RAD business apps to fast graphics using DirectX. It beats Visual C++ on ease of use and Visual Basic on performance. In the Java category, it is the **Highly Commended Visual Café** that

that the Windows tools provide richer environments and faster performance. For most general-purpose applications, Windows currently provides a better solution than Java. But there are still reasons to use Java. One is for distributed and web applications, where Java is a natural fit. Another is that Java's design elegance makes it better for learning, and more productive for beginners and advanced developers alike.

## Table of Features



PRODUCT	VISUAL BASIC 6	VISUAL C++ 6	DELPHI 4	JBUILDER 2	VISUAL CAFE 3	VISUALAGE JAVA 2
SUPPLIER	MICROSOFT	MICROSOFT	INPRISE	INPRISE	SYMANTEC	IBM
URL	www.eu.microsoft.com	www.eu.microsoft.com	www.inprise.com	www.inprise.com	www.symantec.com	www.ibm.com
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Price ex VAT	£69 / £386 / £916	£386 / £916	£78 / £415 / £1570	£79 / £409 / £1549	£185 / £494	£66 / £1299
Price inc VAT	£81 / £453 / £1076	£453 / £1076	£92 / £488 / £1845	£93 / £481 / £1820	£217 / £580	£78 / £1526
Language	Basic	C/C++	Pascal	Java	Java	Java
RAD	✓	x	✓	✓	✓	✓
Code completion	✓	✓	✓	✓	✓	x
Help format	Compiled HTML	Compiled HTML	Windows help	HTML viewer	Windows help	HTML web server
Data access	JET, ODBC, ADO	JET, ODBC, ADO	BDE, SQL Links	JDBC, DataGateway	JDBC, dbAnywhere	JDBC, DB2
Native code compiler	✓	✓	✓	x	✓	✓
Switchable JDK	n/a	n/a	n/a	✓	✓	x
JDK version	n/a	n/a	n/a	1.1.6	1.1.7	1.1.6
COM support	✓	✓	✓	x	x	x
CORBA support	x	x	✓	✓	x	✓
Version control	SourceSafe	SourceSafe	PVCS	PVCS	Third party support	Integrated
Rating	★★★★	★★★★	★★★★★	★★★	★★★★	★★★

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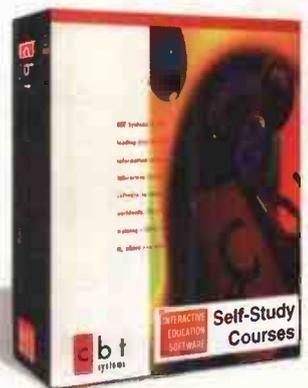
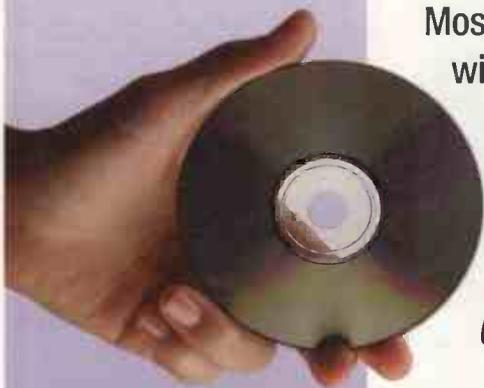
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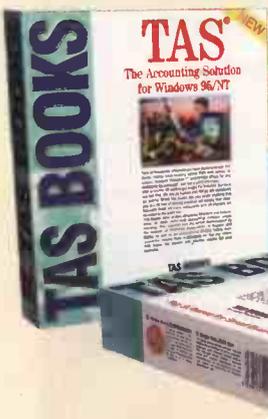
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Could a computer find order in chaos? A **dynamic computer** might, as Tony Howard reports.

## Chaos theory

On the face of it, chaos might seem the natural enemy of computing — a science which, after all, relies entirely upon precision. Dissect any computer system and you'll find error-correcting schemes in use everywhere, from ensuring that files can't get corrupted by the inherent noise in magnetic storage, to guaranteeing that data sent across the internet doesn't get scrambled.

But William Ditto, of the Georgia Institute of Technology <[www.physics.gatech.edu/chaos/](http://www.physics.gatech.edu/chaos/)>, believes that the unpredictability of chaotic processes may power a new breed of computer. Together with Madras mathematician Sudeshna Sinha, Ditto has come up with a radically new approach. He calls the bizarre machine a 'dynamic computer'.

When mathematicians speak of 'chaos', they mean something more precise than our everyday notion of randomness and disorder. Mathematically, chaos is the name given to any irregular behaviour which results from the application of a fixed set of rules. Take a simple pendulum: just a bob on the end of a string. If you set it swinging, its movement is a regular swaying, easily described by a simple equation. No matter how you start the bob off, it will always swing like you'd expect it to. But hang a second pendulum from the bob, then give the lower bob a push, and the whole thing goes haywire. At times the movement is graceful and regular, but then it will suddenly switch to jerky dancing, and back again. There's no evident pattern to the wobbles of the two pendulums. One pendulum — order; two pendulums — chaos.

You can see a nice Java animation of this behaviour at <http://scruffy.phast.umass.edu/a114/DP2.html>. The applet also shows just how sensitive the system is to changes in its initial conditions. Alter the angle between the pendulum bobs by less than one millionth of a degree and the system behaves utterly, and quite unpredictably, differently.

Having studied the chaotic behaviour exhibited by many biological systems, including heart muscles and brain cells, Ditto and his team argued that chaotic systems must have important properties for life, to have survived evolution and natural selection. In particular, they theorised that chaotic processes underpin our capacity for thought. And if the brain can conjure reasoning from chaos, why not a computer?



▲ UNPREDICTABILITY IS BREEDING A NEW FORM OF COMPUTER THAT WILL SOLVE PROBLEMS FOR ITSELF

Ditto's proposed machine is a network of interconnected processors, each of which is a simple chaotic system whose state at each tick of the machine's internal clock is a single numerical value. If, at any tick, an element's state value exceeds a pre-set threshold, it downloads its excess value into a neighbouring element. This process continues throughout the network and can trigger a 'domino effect', with waves of change avalanching

throughout the system. It's these waves that are harnessed to do the computing. It sounds abstract and intangible, but Ditto and Sinha have proved mathematically that it will work. Crucially, they've demonstrated that such a

Ditto and his team argued that chaotic systems must have **IMPORTANT PROPERTIES FOR LIFE**, to have survived evolution and natural selection

machine could implement logic functions such as AND and OR. And they've gone further, showing that their hypothetical chaotic computer can directly perform basic numerical operations like addition and multiplication. As for building an experimental machine, Ditto's plans are adventurous, to say the least. He intends to build the whole thing out of criss-crossing laser beams.

The **dynamic computer** is promising because of its flexibility. By changing the connections between the individual processors, and their thresholds, Ditto's machine can be rapidly reconfigured to solve different kinds of problem. One technical challenge will be to determine how to configure the system to solve a particular problem. But perhaps another, more awkward hurdle will be to persuade people to trust a computer built from chaos. Would you? □

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# hands on

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**T**his month sees the start of a 10-part countdown to the millennium. Some doom merchants may be calling this the 'Final Countdown' with the world poised on the verge of a total shutdown when the clocks strike midnight on 1st January, 2000. But whatever the outcome you'd better be prepared, so how better than to gather some top tips from our *Hands On* contributors. This month, Roger Gann outlines the hardware-related Y2K issues, suggesting various utilities designed to check compliancy, and offering his expert advice on overcoming potential problems. Part 2 of Nik Rawlinson's *Web Authoring Workshop* continues in the May issue but this month Jason Finch shows how some simple JavaScript can spice up your home page. The Linux revolution gathers pace with Cliff Joseph's Mac column taking a peek, and Benjamin Woolley praising two Linux-bundled 3D graphics packages. As always, the contents of our *Hands On* columns are really down to you, the reader, so please feel free to send comments and suggestions to the contributors, or direct to myself.

IAN ROBSON, HANDS ON EDITOR  
IAN\_ROBSON@VNU.CO.UK

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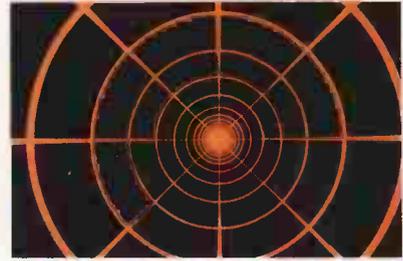
## PCW Hands On on CD-ROM

Now it's easy to find that *Hands On* tip, trick, advice or review again — there's a whole year's worth of columns on our monthly PCW CD-ROM. So if that handy hint is on the tip of your tongue, don't sit and sweat: the answer is at your fingertips.



# On the slide

Slip some fun into your website with a **JavaScript slide puzzle**. Jason Finch shows you how to work it out.



**M**any people assume that the only place you will find a JavaScript rollover is in the creation of a flash menu where one image turns into another as the user runs the mouse over the various options. But with a little imagination there are many ways in which the technique can be implemented in more innovative ways.

The JavaScript Slide Puzzle is a tight piece of programming which enables anyone to implement a client-side slide puzzle into their web pages. Traditionally, these are hand-held games featuring a picture divided into a grid of pieces with one blank. The pieces are shuffled and rearranged by moving one piece at a time into the blank square until the whole picture is restored.

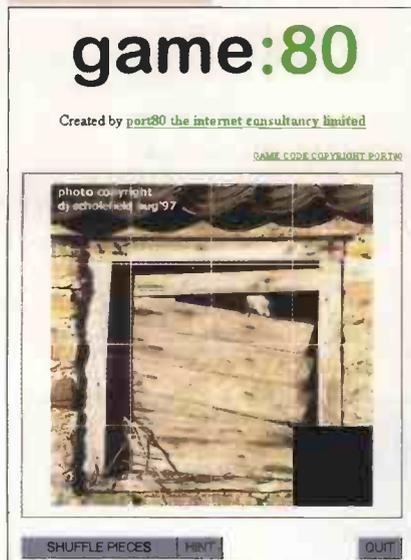
### ➤ Rollover

JavaScript version 1.1 and above treats each image on a web page as an object with various attributes. One of these is the src attribute (the source), the filename of the graphic data which

creates the actual image on the screen.

Programmers use the conditions

▼ **FIG 1** THIS SLIDE PUZZLE USES THE LATEST BROWSER TECHNOLOGY TO GIVE YOU A FAST, INTERACTIVE GAME



onMouseOver and onMouseOut to call JavaScript functions when the mouse pointer passes in and out of the screen area where a graphic image appears. It is defined in HTML by the IMG tag and given a NAME so the function knows which image source to change. The function assigns a different graphic file to the src attribute of the named image and so the graphic displayed on the screen appears to change.

When coders create rollover menus, this is what happens: when the mouse passes over the image a different graphic file is assigned, and so it changes. The src attribute reverts to normal when the mouse moves out of the area. It's that simple.

**We want to create a slide puzzle** in JavaScript so that a user could disconnect from the internet and still play the game, without calls having to be made back to the server between each move as is the case with less sophisticated solutions to the problem.

Consider how a slide puzzle might work. We split our original picture into 16 pieces and create a four by four grid of images, each one called blockXY.jpg where X and Y are numbers corresponding to grid positions. So, block00.jpg is the part of our image from the top left corner and the other segments of our original picture are block10.jpg, block20.jpg and block30.jpg. By the same token, the bottom left corner is block03.jpg and the piece that belongs in the bottom right corner is block33.jpg. By arranging all of these in the correct rows and columns of the four by four grid, the original full picture will be seen. By changing the position of any of the pieces, we shuffle the squares of the picture, just as in a traditional slide puzzle.

**Now let's apply JavaScript logic** to this problem.

- Display 16 images on the screen in a four by four grid, assign the NAME at00 to the top left image (column 0, row 0), at10 to the next on the row, at20 and at30 for the next and top right ones respectively.

- Continue along the next row (row 1), assigning the NAMES at01, at11, at21 and at31 to the images.
- Continue for the next two rows.

To initialise the grid with the original pieces in the correct order, make sure that the src attribute of each of these images is blockXY.jpg where XY is the same as in the atXY for the particular image. So, to start with, the HTML tag for the top left image would be:

```
<IMG ALT="(0,0)" SRC="block00.jpg" WIDTH=100 HEIGHT=100 NAME="at00" BORDER=0>
```

(Key: ✓ Code string continues).

We set BORDER=0 because we will be making each image clickable and we don't want a border to appear around it.

Imagine this is a slide puzzle with the 'blank' square in the bottom right corner (column 3, row 3). See Fig 1. Remember that this is the fourth column because the leftmost column is column 0 so instead of assigning that one as block33.jpg we call it blank33.gif — a simple black square. Therefore the initial situation is that the src attribute of at33 is defined as 'blank33.gif' — so, in JavaScript we could write this as:

```
document.images[at33].src="blank33.gif";
```

(Key: ✓ Code string continues).

But it's better to define a special object called 'blank' and assign to it the appropriate graphic image. We will assume that each image is 100 pixels across by 100 pixels down:

```
var blank=new Image(100,100); blank.src="blank33.gif";
```

Consider what happens when, with an actual slide puzzle, you move the piece from column 2 of row 3, the one to the left of the blank square, into the position of the blank, column 3 of row 3. The two pieces swap around and the definition of the part of the picture at (3,3) becomes the same as the piece which was at (2,3) and the definition of the part of the picture at (2,3) becomes the same as the piece that was at (3,3), the blank piece. This is the simplest example.

Consider instead if you were to start with the top right piece and move all the pieces of column 3 down one position of the grid. From the bottom up, the blank position (3,3) takes on the look, or piece, from (3,2). And (3,2) takes on the look of the piece at (3,1). Now the piece at (3,1) becomes the piece that was in the top right, at (3,0). But what becomes of position (3,0)? Well the blank piece goes there — visualise it.

In JavaScript this can either be achieved in a particularly clumsy way, or it can be achieved in a way that can be applied to any number of pieces moving 'down' the game grid at any position. The clumsy way is easy:

```
document.images[at33].src=
document.images[at32].src;
document.images[at32].src=
document.images[at31].src;
document.images[at31].src=
document.images[at30].src;
document.images[at30].src=
blank.src;
```

(Key: *Code string continues*).

If we analyse what happens in the situation where we want to move one or more pieces down into the blank square, we will see that we can apply it to the other three main moves — moving pieces left, right and up.

**A less clumsy way** is to assign some variables — `clickx` and `clicky` represent the column and row, respectively, where the user has clicked. This is the piece that the user wants to move. And, `blankx` and `blanky` represent the column and row of the blank piece. In our previous example, the state of the variables is: `clickx=3`, `clicky=0`, `blankx=3` and `blanky=3`.

- Focus on the column in which the user clicked (`clickx`) and start with the current position set to the row with the blank in it (here row 3, but more generally `blanky`).
- We move the piece from the row immediately above the current position, down one row to the current position.
- We continue up the rows until we've assigned the image for the position below the one where the user clicked (`clicky`).
- The piece at the row and column where the user clicked becomes the blank piece.

In JavaScript, we do this by changing the `src` attribute of each image in turn. To make life easier we'll define two variables: `movefrom` and `moveto`. We can generalise this sequence with a JavaScript for loop:

```
for(movey=blanky;movey>
clicky;movey--)
{
  movefrom="at"+clickx+
(movey-1);
  moveto="at"+clickx+movey;
  document.images[moveto].src=
document.images[movefrom].
src;
}
document.images[movefrom].
src=blank.src;
```

(Key: *Code string continues*).

The piece in the bottom right is

always called `at33`, no matter what that piece looks like; whether it is sourced from `block00.jpg`, `block23.jpg` or any other. So, on every occasion that we switch over any two pieces, no matter what they look like, we know the NAME of the image whose `src` attribute needs to be changed — the NAMEs themselves never change. *This is a fundamental concept that you must understand to grasp how the whole slide puzzle works.*

**The above code** can be implemented into a function `slideDown`, together with a more general function `slide` which determines whether we need to slide the pieces up, down, left or right into the blank position. If the user clicks in the blank square then we do nothing at all. Fig 2 shows these two functions. The other three — `slideUp`, `slideLeft` and `slideRight` — can be deduced from `slideUp` by thinking about what happens to each piece in relation to the blank and where the user clicks.

To call the main `slide` function we use the `onClick` condition as part of an `<A HREF>` construct, linking back to the current page but calling the function on the way:

```
<A HREF="#" onClick="slide
(0,0)"><IMG ALT="(0,0)" SRC=
"block00.jpg" WIDTH=100
HEIGHT=100 NAME="at00"
BORDER=0></A>
```

(Key: *Code string continues*).

This solves our main problem of how to move the pieces of the slide puzzle around. We use JavaScript rollovers to do it, and we use JavaScript functions that are versatile enough to move any one or more pieces from any position on which the user clicks up, down, left or right into the blank square.

### [FIG 1] Slide functions

```
function slide(clickx,clicky)
{
  if ((clickx==blankx) &&
(clicky==blanky)) return;
  if ((clickx==blankx)
|| (clicky==blanky))
  {
    if (clicky>blanky)
slideUp(clickx,clicky);
    if (clicky<blanky)
slideDown(clickx,clicky);
    if (clickx>blankx)
slideLeft(clickx,clicky);
    if (clickx<blankx)
slideRight(clickx,clicky);
    blankx=clickx; blanky=clicky;
  }
}
function slideDown(clickx,clicky)
{
  for(movey=blanky;movey>clicky;movey--)
  {
    movefrom="at"+clickx+(movey-1);
// from above current position
    moveto="at"+clickx+movey; // to
current position
    document.images[moveto].src=
document.images[movefrom].src;
  }
  document.images[movefrom].src=blank.s
rc
}
```

(Key: *Code string continues*)

#### ➔ Solving it

Our next problem is to work out whether the puzzle has been completed. In the original situation, the `src` attribute of the top left image (0,0) is defined as 'block00.jpg'. Its NAME is always `at00`. The top right image (3,0) is `block33.jpg` and its NAME is always `at30`. At any point in a puzzle where the pieces have



been shuffled, position (0,0) could be sourced from, say, block13.jpg but its NAME would still be at00 and so document.images[at00].src would be 'block13.jpg'. Similarly, any general position (X,Y) could be sourced from blockAB.jpg but its NAME would remain as atXY. So, the only time that every single piece has the same digits in its src attribute as the digits in its NAME is when the pieces are in the original, correct order.

**Let's define a function,** checkSolved, which assumes the puzzle is solved. See Fig 3. It sweeps down the rows and across the columns of the game grid, working out the name that was assigned to that position on the grid and the src attribute of the image currently at that position. From the src attribute, say 'block13.jpg', we can calculate the original position of the piece — in the case of block13.jpg it would be (1,3) and would have started life in the position that is NAMED at13. It may now be in the position NAMED at33 or any other. If it's not in the correct place then we know the puzzle hasn't been solved. If we've swept all positions on the grid and haven't declared the puzzle as 'not solved' then by a process of elimination, it is solved.

**Let's assume** that the image block00.jpg, originally found in the top left corner of the puzzle, is currently at position (1,3). While sweeping the grid, let's look at what happens when x=1 and y=3, position (1,3). If we assign the code name1="at"+x+y; block=document.images[name1].src

(Key: ✓ Code string continues). the variable block contains 'block00.jpg' in this example, and name1 is equal to 'at13'. We can grab the offset within the string of the two digits. We know it starts two characters before the dot. In JavaScript, we use the lastIndexOf method and assign start=block.lastIndexOf(".")-2

Start becomes a numeric value equal to two less than the position in the string 'block00.jpg' (the variable block) of the dot. Our filename may be more

### [FIG 3] Defining checkSolved

```
function checkSolved()
{
  solved=true;
  for(y=0;y<gridheight;y++)
  {
    for(x=0;x<gridwidth;x++)
    {
      name1="at"+x+y;

      block=document.images[name1].src;
      start=block.lastIndexOf(".")-
2;
      name2="at"+block.substring(
start,start+2);
      if (name1!=name2) solved=false;
    }
  }
  if (solved)
  {
    alert("You solved the puzzle");
  }
}
(Key: ✓ Code string continues)
```

complicated. It may feature a path name as well, so we cannot automatically assume we know the position of the dot.

The final step is to use the substring method to pull out the two numbers in which we are interested. It takes two integer parameters; beginning at the first offset and ending with the character immediately before the second offset: name2="at"+block.substring(start,start+2);

(Key: ✓ Code string continues). This works out the NAME of the position where this image started. In this case it started out at at00 — we knew that but it takes computers a little longer to do that kind of analysis.

#### Shuffling

Our final problem is shuffling the pieces to begin the game. The easiest way to do this is to simulate a user random-clicking a series of pieces. A randomSlide function counts down a number of iterations. Each time through the loop, a random number makes the decision whether to make a move in the same column as the blank square, or in the same row. Once we've decided where to 'fake' the click, the slide function is called to perform the rollovers of the graphic images and to keep track of the position of the blank square.

#### Extras

Around all of this code we have added a number of extra features so, for example, it counts the number of moves that are taken, allows the user to request a 'hint' picture, and the latest addition replaces the blank piece with the missing square of the puzzle when the user successfully solves it. As you may expect, this is done by switching the src attribute of the blank square, located at position (blankx,blanky): replace="at"+blankx+blanky; document.images[replace].src="block"+blankx+blanky+".jpg";

(Key: ✓ Code string continues).

Perhaps the most important extra is detecting whether or not the user's browser can actually support the playing of the game. We do this by reading environment variables browserName and browserVer. By analysing their values we can set a variable version to 'yes' or 'no', used by the code at various points to determine whether to perform functions or to display warnings:

```
var browserName=navigator.
appName;
var browserVer=parseInt(
navigator.appVersion);
if ((browserName ==
"Netscape" &&
browserVer>=3) ||
(browserName == "Microsoft
Internet Explorer" &&
browserVer>=4)) { var
version="yes"; }
else { var version="no"; }
(Key: ✓ Code string continues).
```

Because the initial aim was to make the puzzle as easy as possible to implement, everything in the code can be changed by amending a number of variables at the start of the program code. This allows the user to specify everything from the grid width and height, to the directory in which the images are found.

A fully-commented version of the entire code can be found on this month's cover CD (filename Slide.zip). The latest version is available on the internet from [www.port80.com/slide/](http://www.port80.com/slide/)

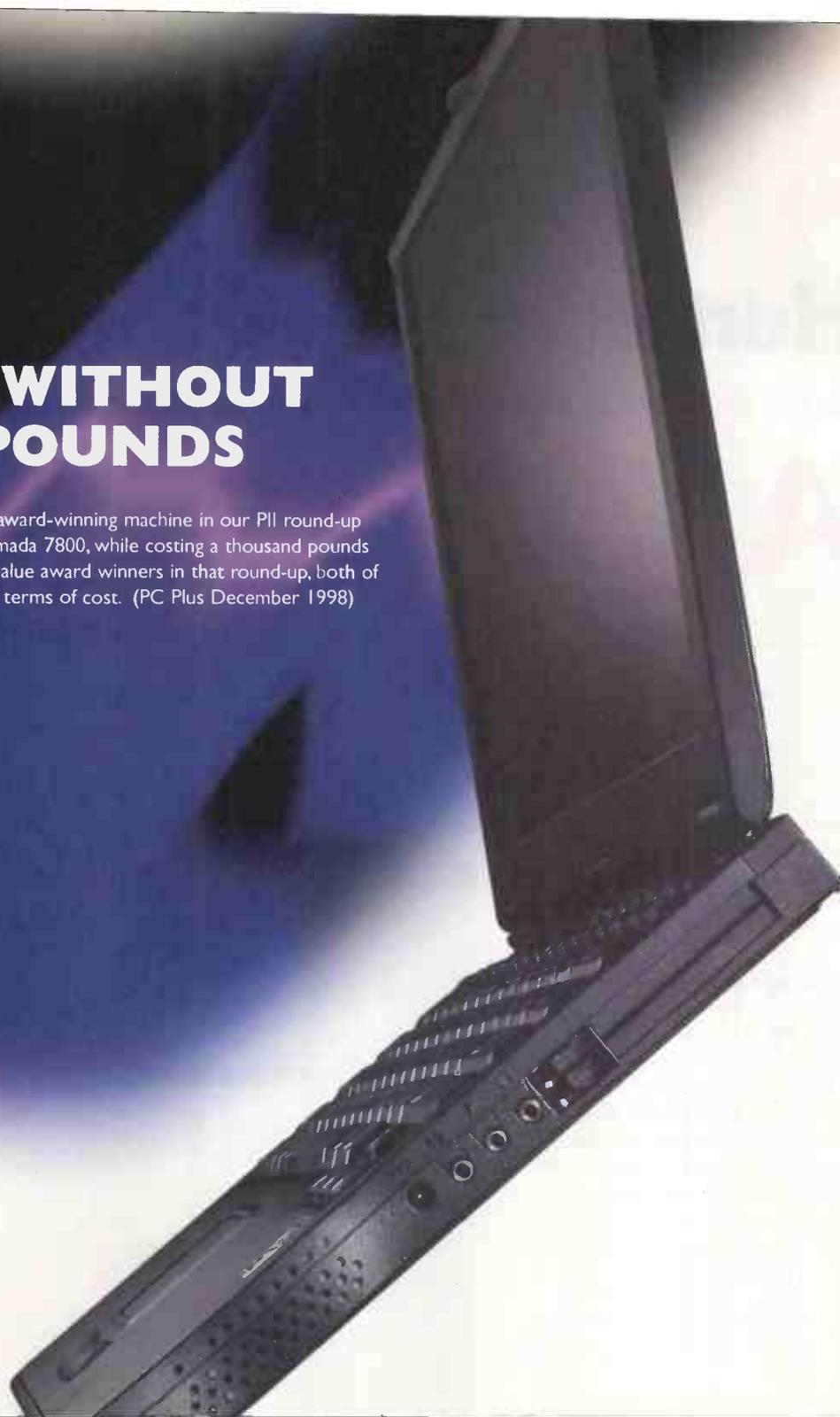
Next month, Nik Rawlinson returns to continue our web authoring workshop.

### PCW CONTACTS

Jason Finch is a Director of port80 the internet consultancy limited and can be contacted at [jason@port80.com](mailto:jason@port80.com)

# POWER WITHOUT THE POUNDS

"Overall, the TII came close to the award-winning machine in our PII round-up published in issue 143, Compaq's Armada 7800, while costing a thousand pounds less. It also out-performed our two value award winners in that round-up, both of which are comparable to the TII in terms of cost. (PC Plus December 1998)



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"Power by name and powerful by nature, it offers great performance at a price just a whisker away from being the lowest in this group test...Although the Powercom and the Toshiba are very different we recommend them both." "This is the first 266MHz notebook to be available in the UK, just beating Dell & Gateways offerings. The processor is the latest in Intel's Pentium range of low power consumption chips, designed specifically for notebook PCs." What PC? Review March 98

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# Home and away

Being on the road needn't leave you in data limbo. Bob Walder shows you how to stay in touch.

An increasing number of people are travelling around with laptops and mobile phones nowadays yet once out on the road they are well and truly on their own. But it's not that difficult to gain access to the data held on your corporate LAN or desktop PC while you are on your travels.

In this workshop we'll show you how to implement a simple remote access connection using just Windows 98 at both the client and server end. Everything mentioned in this workshop applies to Windows 95, too, it is just that you get the Dial-Up Server component in the box with Windows 98, whereas Windows 95 users will have to purchase the optional Plus! Pack to acquire it.

## Dial-Up Networking

With Dial-Up Networking (DUN), you can configure a computer running Windows 9x to be a remote access server for dialup clients running Windows 98, Windows 95, Windows for Workgroups, Windows 3.1, or indeed any other client running PPP (Point to Point Protocol).

The Windows 9x dialup server can act not only as a server to the client, sharing its file and printer resources with one dialup client at a time but also as a gateway to an IPX/SPX or NetBEUI network as long as both the client and the server are using the same protocol as the network.

There are a few key differences between the Windows 98 dialup server and the more advanced NT-based Remote Access Server (RAS):

- Windows NT Server 4.0 and later can act as a VPN server; Windows 98 cannot.
- Windows NT Server 3.5 and later can act as an IP router whereas Windows 98 cannot. IP router capabilities permit access to a TCP/IP network, such as the internet.
- Windows 98 provides all the protocols you need to connect to the internet but cannot act as an IP router.
- Windows NT Server 3.5 and later versions support 256 remote connections, whereas Windows 98 provides only one remote connection at a time.

## Installation

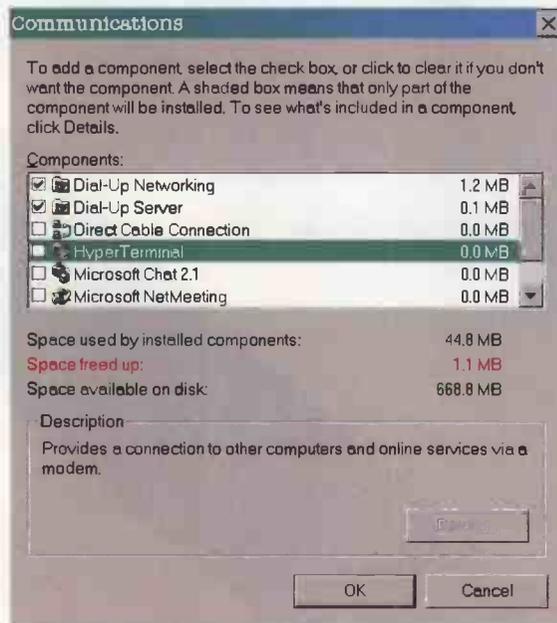
In Windows 98, the Dial-Up Server is not automatically installed, though at least it is now included on the CD:

- **Select** the Add/Remove Programs applet in the Control Panel.
- **Select** Communications under the Windows Setup tab, and click on the Details button.
- **Ensure** that Dial-Up Networking and Dial-Up Server are both checked, and click on OK [Fig 1].

This installs the server component along with the client, too, if that was not already installed.

- **Select** the Sharing option.
- **Click on Share As** and give the share a descriptive name. But keep it short. For instance, on a PC called BOB I would call the C-drive BOBC and the DATA directory BOBDATA.
- **Assign security.** If you are using share-level security on the PC, give it a password and set the required Access Type. If you are employing user-level security (recommended) you can choose from a list of users on your designated authentication provider — perhaps an NT Domain. This was covered in detail in the Dec '98 *Hands-On Networks* column.

Try to avoid sharing the root directory of a drive since that makes the entire drive accessible due to the fact that all subdirectories of the shared directory are automatically shared. You would then have to visit each subdirectory individually to remove the access rights from those you did not want to make available. It is far safer to grant access only to those specific directories you know you need to share.



◀FIG 1 SELECTING DIAL-UP NETWORKING (DUN) AND DIAL-UP SERVER COMPONENTS (WINDOWS 98)

If you wish to share your computer's resources over DUN you will also need to install File and Print sharing:

- **Select** the Network icon in the Control Panel.
- **Click** on File and Print Sharing.
- **Check** one or both boxes to provide access to local files and/or printers to remote users.

Once your PC has rebooted you are able to designate resources such as local directories, or even entire disk drives, to be shared over the network:

- **From Explorer**, or from the My Computer window, right click on the directory you wish to share, or select the Properties option from the File menu.

## Security

This same share, or user-level security split, also applies to the Dial-Up Server itself and, if you are going to be allowing access to resources such as disk shares over DUN, it would be wise to make use of the meagre security offered by Windows 98.

Dial-Up Networking gives you the option of requiring a password to connect to the remote access server, depending on whether the Windows 98 dialup server is protected with share-level or user-level security.

Share-level security assigns a password to the Windows 98 dialup server. When users dial in, they must

provide the password before they can gain access. After the connection has been established, they can browse the resources on the dialup server subject to whatever level of security has been applied to them when the shares were created. People can also log on to the network after connecting to the dialup server if logging on to the network is enabled on the dialup client. Because users can distribute passwords, this method is less secure than user-level security and you should note that share-level security is unavailable on NetWare networks.

User-level security restricts access to a network resource until a security provider, such as a Windows NT domain controller or a NetWare server, authenticates the request. You can set the requirement that a user's logon password to a remote access server be the same as the network and Windows 98 logon passwords.

With user-level security, when someone accesses shared resources on the dialup server, Windows 98 controls their rights to the shared resources, such as whether they have read-only or full access to files. Access rights are specified in the sharing properties for each resource protected by user-level security.

### ➤ Dial-Up Server configuration

OK, we have installed the server component and enabled file and printer sharing if required. We are now ready to configure security options and fire up the Dial-Up Server.

**1** Open the Dial-Up Networking folder. This is done by double-clicking the MyComputer folder to open it, followed by Dial-Up Networking, or by clicking Start, pointing to Programs, then Accessories, followed by Communications and then clicking Dial-Up Networking.

**2** For user-level security: in the Dial-Up Server properties, click Allow caller access and then click Add. In the Add Users dialogue box, specify those who will have permission to access the dialup server and click OK [Fig 2].

**3** For share-level security: in the Dial-Up Server dialogue box click

Allow caller access [Fig 3] and then Change Password so as to provide password protection for the Dial-Up Server.

**4** Click Server Type and then make the relevant selection.

**5** Make sure that the server type is the same for both the dialup server and the dialup client. If the latter uses PPP you can also select the Default server type. In this case the dialup server will automatically start in PPP mode for incoming calls and switch to

Windows for Workgroups and Windows NT 3.1 if the PPP negotiation fails. Notice that changes to the server type do not apply to a currently open connection. Changes will apply to any future connections made to this computer.

**6** In the Dial-Up Server properties, click Server Type and make sure 'Require encrypted password' is checked – if your Dial-Up client supports encrypted passwords.

**7** Click OK and the dialup server is ready to answer incoming calls.

*If you have forgotten something, it is only a phone call away*

the Dial-Up Networking window:

- From the Connections menu in the Dial-Up Networking window, click Dial-Up Server.
- In the Dial-Up Server dialogue box, click No caller access.

You can also completely remove Dial-Up Server capabilities from a user's computer by taking the Add/Remove Programs option in Control Panel. For a

more centralised approach a network administrator could disable dialup support on each computer, or on a

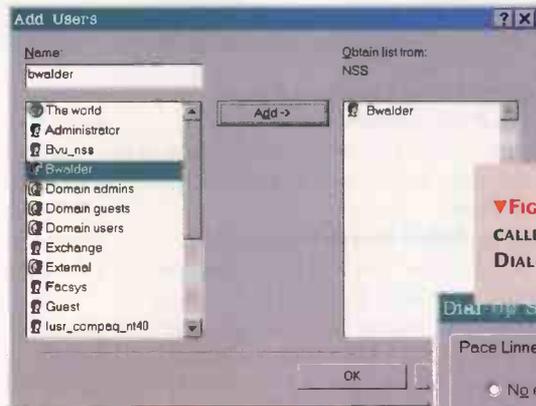
system-wide basis, by using System Policy Editor, either to change a single computer's registry or to define policies which can be shared by multiple computers.

To disable dialup support by using System Policy Editor, click Disable Dial-in. The Dial-Up Server menu option still appears on the Connections menu after dialup support has been disabled but no dialogue box for setting up the dialup server will appear.

### ➤ Dial-Up Networking client

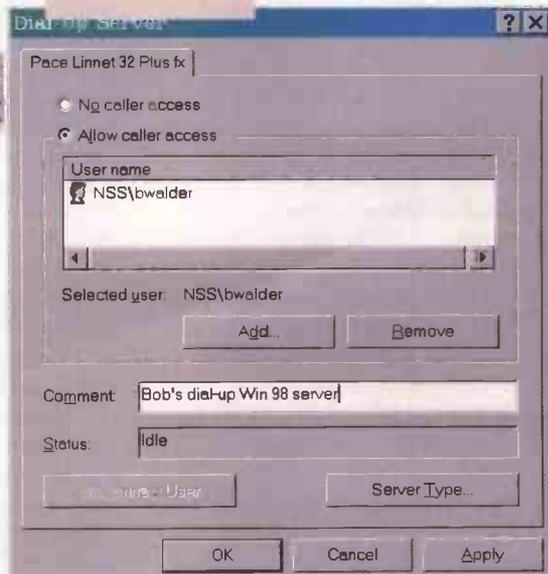
Now that your desktop PC is ready to act as a DUN server, the only thing you have to remember is to plug in your modem and enable caller access each time you leave the office. Of course, you still need

to configure your notebook PC to allow DUN calls but this is straightforward with the Connection Wizard:



▲ FIG 2 SETTING USER-LEVEL SECURITY IN DIAL-UP SERVER

If you are not using the PC as a full-time Dial-Up Server but rather for occasional access when you are out of the office, then it would be wise to disable the dial-in capability when not in use, as a security precaution as much as anything else. This can be done simply within



▼ FIG 3 ENABLING CALLER ACCESS IN DIAL-UP SERVER



◀ FIG 4  
NAMING THE CONNECTION AND SELECTING A MODEM

▼ FIG 5  
THE CONNECTION ESTABLISHED WINDOW

**1** Double-click MyComputer. Then double-click Dial-Up Networking.

**2** When first installed, there will just be one icon in this window; Make New Connection. Double-click it to start the Connection Wizard.

**3** The default name is MyConnection. Change this to something more descriptive.

**4** Select the modem you wish to use for this connection [Fig4]. The idea is that you could create different connections for the same Dial-Up Server with each using a different modem — say one for a standard PSTN modem and another for a cellular phone connection.

**5** Click on the Configure button to check the modem parameters. Usually, there should be nothing to change here if the modem has already been correctly installed and configured.

**6** Click on the Next button and then enter the telephone number of the line to which your Dial-Up Server is connected. If required, the area and country codes will automatically be included by Windows 98 when the call is made. For instance, when you make the call, if your current location is France the country code and area code will be used.

**7** Click the Next button, click the Finish button and the new icon will be created.

**10** Right click the new icon and select Properties. Ignore General, Scripting and Multilink for now and select the Server Types tab.

**11** Type of Server should be set to PPP: Internet, Windows NT Server, Windows 98.

**12** Select Logon to network if you would like Windows 98 to automatically log on to the destination server.



**13** Select enable software compression to reduce the transfer time. This option should work in most cases but try disabling it if you have problems.

**14** Select Require Encrypted Password if this option has been set on your Dial-Up Server. This enables software encryption of your user name and password, rather than sending it over the wire as plain text.

**15** In the Allowed Network Protocols box you must ensure that the client is using the same protocol as the server. All three will be checked by default, but if you only require TCP/IP you should disable the other two as it reduces potential for problems and speeds up the connection.

Once you have completed this stage, your client is ready to initiate a connection.

- Double-click on the new icon to fire up the connection.
- Enter the username and password if you are logging on to the network once you have connected.

- Confirm the phone number and location from which you are dialling.
- Click on Connect and you should see a progression of Dialling, Verifying User Name and Password, and Connection Established windows.

Click Close on the Connection Established window [Fig 5].

Your PC is now connected to the remote Dial-Up Server. Click on Start, then Find, then Computer and enter the name of the Dial-Up Server PC. Next, click on Find Now. The Dial-Up Server should appear in the results window, at

which point you can double-click on it to open an Explorer window on that PC.

Once the available shared resources appear you can treat these exactly like local resources, copying files, mapping directories as network drives, sending jobs to printers and so on.

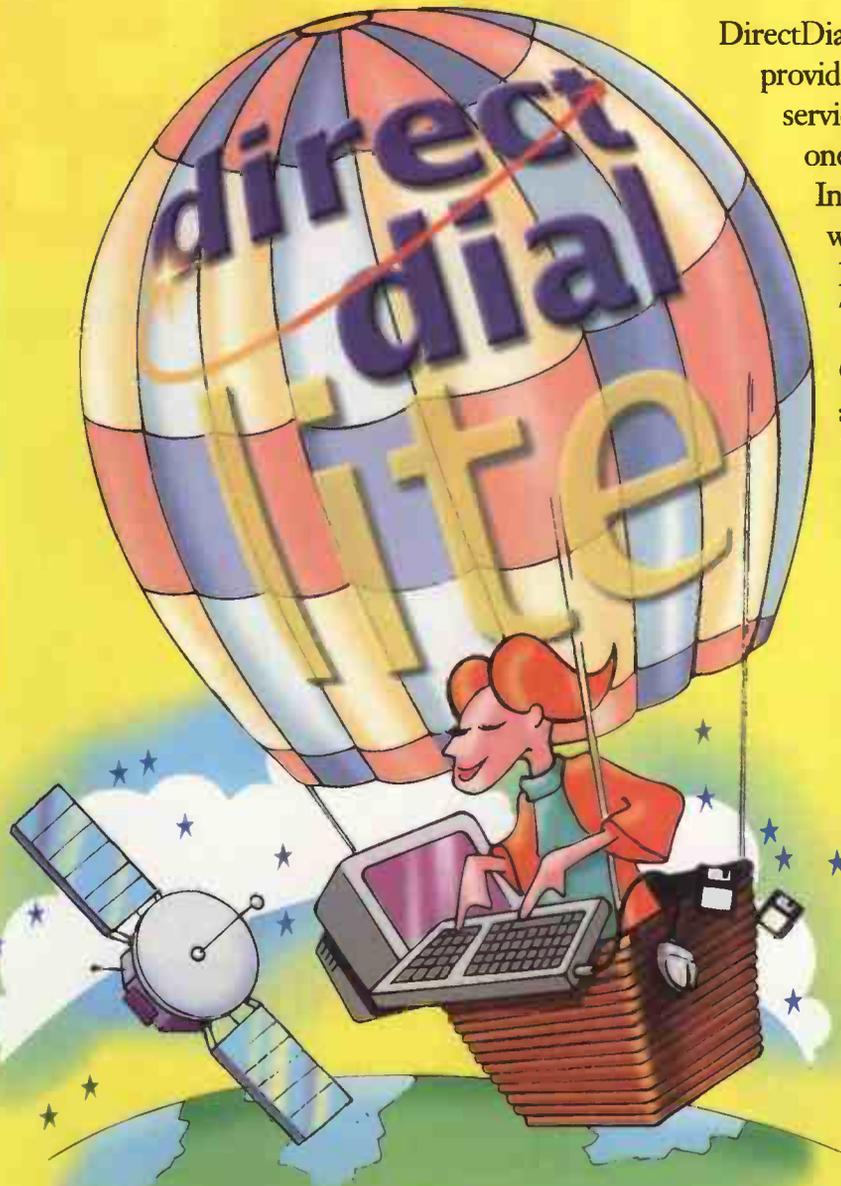
Throughout the session, a small icon sits in the system Tray. Double-clicking this icon brings up a session information window which shows the number of bytes transferred, connect time and so on. Once you have completed your work on the remote PC, click on the Disconnect button in this window to close the session.

That's it. You can now travel anywhere with your notebook, safe in the knowledge that if you have forgotten something, it is only a phone call away.

### PCW CONTACTS

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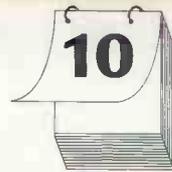
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# T minus ten months



In the first stage of our ten-part countdown to the year 2000, Roger Gann looks at **hardware**.

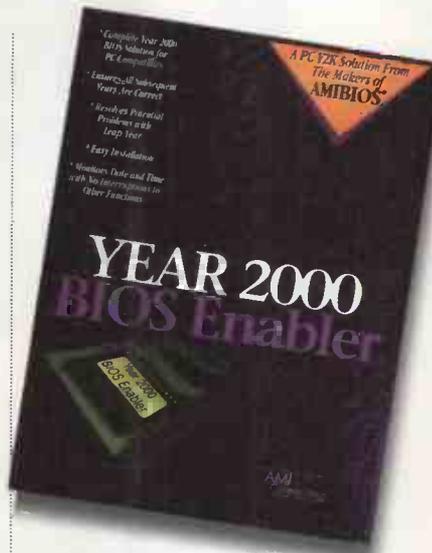
If you are still using a pre-AT, IBM PC or similar and running a recent version of MS-DOS, then you are to all intents and purposes Y2K-compliant. Mac users, too, can sit pretty on New Year's Eve as the internal clock in all Macs will be accurate until at least February 2040. In fact, the latest models are good until the year 29940.

Most PCs are *not* Y2K-compliant. But the reason is simple. When IBM launched its PC-AT in 1984 it included a battery-backed Real Time Clock (RTC) which used digital watch technology to store the date and time. Every time you turned on your PC, you didn't need to enter the date and time because the operating system would retrieve it, via the BIOS, from the RTC.

In fact, there are three clocks running in a PC: the RTC time, the BIOS' interpretation of the RTC time, and the OS clock picked up from the RTC at boot time. Rarely do they stay in perfect sync! Typically, the RTC contains seven registers which store the time and date. The first six are updated automatically whether your system is on or off, with each storing a different value: seconds, minutes, hours, days, months and years. The problem lies with the year's register as only two digits are counted, not four.

**To allow for centuries**, a seventh register holds the so-called century data (i.e. 19 or 20). However, the RTC does not automatically update the century registers — something else has to increment from 19 to 20 at the right moment. That something is the BIOS. So, if the RTC is not adjusted, as 31st December 1999 becomes 1st January 2000, its first six registers will correctly roll over but its century register will still read 19. The RTC will assume the year is 1900 and DOS will read it as 1980. Thus, if a PC boots after 31st December 1999, an intelligent BIOS should go into the RTC and replace 19 with 20 when the year changes from 99 to 00. Or, at the

**DOS will cope but your RTC and BIOS may not**



very least it should recognise that the 19 is wrong and pass a 20 whenever the OS requests the date. Some BIOSes use 'date windowing' based around a pivot date of, say, 1979. If it sees a year higher than 79 it assumes the century digits to be 19. If it's lower, it uses 20 instead.

At boot time on 1st January 2000, though, an unintelligent BIOS will retrieve a 19 from the RTC's century register and tell the OS that the year is 1900. Another problem lies with PCs which are left on over midnight, New Year's Eve 1999. These will fail to 'roll-over' the date correctly. Luckily, though, most OSes are aware of this and will compensate.

**It's easy enough to test this manually.** Simply boot to a DOS prompt to avoid any OS 'compensation' and, using the DATE and TIME commands, set the date and time to 23:59 on 31/12/99. Using the free VIEWCMOS utility from [www.righttime.com](http://www.righttime.com) you can see how all three system clocks handle the transition. DOS will cope but the RTC and BIOS may not.

You should also test your RTC's roll-over capabilities by setting the date and time as above, then turning off your PC and waiting a couple of minutes before powering up and checking the date and time. If the year reads 1980, you have a problem. But if the year reads 2000,

you're probably OK: your BIOS has changed the century register to 20 and will pass the year 2000 to your OS.

There's no shortage of free utility software to test your PC's clock hardware for you. Ontrack has the Y2K Advisor at [www.ontrack.com/op/op\\_6.asp](http://www.ontrack.com/op/op_6.asp) and NSTL <[www.nstl.com/html/nstl\\_ymark2000.html](http://www.nstl.com/html/nstl_ymark2000.html)> has its Ymark 2000 test utility. Of the two, I much prefer the Ontrack software.

**What should you do** if your PC's clock hardware has a problem? The good news is that you won't have to spend too much money to fix your hardware or cure the problem. If your PC has a flash BIOS, pay a visit to the motherboard manufacturer's web site to check for a BIOS upgrade, which is free. Or, you can add a little shareware program to your AUTOEXEC.BAT file which will correct your system date. Check out [www.wsnet.com/~designer/holmesfx](http://www.wsnet.com/~designer/holmesfx). For many users with problem PCs the solution is simply to turn your PC off on New Year's Eve and power it up the next day, entering the correct date, either at CMOS Setup or from a DOS prompt.

Hardware solutions are available, too, in the form of a small ISA card with either some additional, corrective BIOS code like the AMI Year 2000 BIOS Enabler (£55.17) and the Fernlink 2000 Millennium BIOS Board (£58.74), or a replacement Real Time Clock such as Diamond Network Technologies' YIIC board (£46.99) which deals with RTC roll-over problems. These three products all work but they're pricey, non-Plug and Play and eat an ISA slot. For standalone PCs the free fixes listed above are preferable. (All prices incl VAT).

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# Home front

Home users could run their own web server but software reliability is lacking says Nigel Whitfield.

**B**y the time you read this, the BT trials of ADSL will be winding down. There's even a slim chance that cable companies will have decided to launch some form of high-speed net access. So, when people at home can have a permanent connection what's to stop them running a web server on their home PC? You can stuff it with the images that will not fit in the 10Mb of free space from your provider or add extra goodies to spice up pages, such as having your own scripts running on your own computer.

There are many possibilities, as long as the small print permits. It is also most likely that if you try to do much with a typical Windows- or Mac-based system of today, you'll very likely find that

it's not up to it. You'll crash, your other work will go slowly and you'll be plagued by security problems.

**I am at it again** with doom and gloom. But it's a fair point. The time's not long off when it's going to be easier than ever for people to experiment creatively with

*Given a permanent connection, what's to stop people running a web server on their home PC?*

the power of the internet. But for that to happen, we need reliable tools.

You could, of course, always turn to Chris Bidmead's column on p245 and

find out about running Linux on the end of your net connection. But that's going a bit far for some people.

It is not much to ask, but how long can you manage to leave your computer running without having to reboot it, or sort out a program that has crashed? For many people, rebooting is a way of life. You might be able to cope with that when you are just playing games or doing odd bits of work but if you want to leave your system connected to the net all the time?... Give us a break!

There are many reasons why we deserve more reliable personal computer software than we have now. Cheap, permanent internet connections will provide us with one more. Hopefully, the popularity of the net will at last provide the software companies with an incentive to deliver.

## Questions

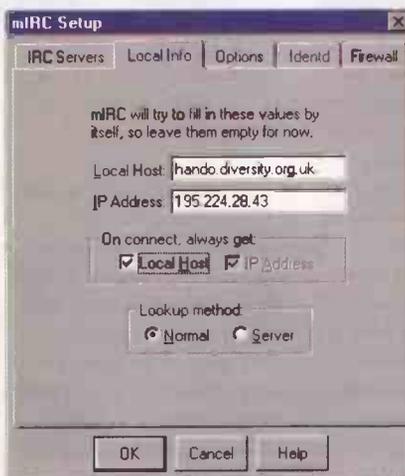
### & answers

**Q** I use mIRC to chat to people on the internet but I'm having problems sending pictures and other files to people. It worked the first time but now everyone says their system can't open a connection to me. I can still receive files without problems, though.

**a** This is a common problem which is straightforward to fix. It happens because mIRC has the wrong internet address for your computer, and this address is used when it sends a message to another user to try and deliver a file. The first time you connected, mIRC will have worked out the address but with many internet providers you're allocated a different address each time

you sign on. As a result, you no longer have the correct one in the mIRC settings and so DCC file sends don't work. To fix the problem, go to the File

need to delete so just click in each box and delete whatever has been entered. Below that, in the section marked 'On connect always get', make sure



**FIG 1** IF THE LOCAL SETTINGS ARE WRONG, YOU WON'T BE ABLE TO SEND FILES ON IRC

both boxes are ticked; the IP address box should be checked automatically when you tick 'Local Host' [Fig 1]. You will

need to disconnect from IRC and then reconnect. Everything should then work fine.

menu and choose Setup. When the setup box appears click on the tab labelled 'Local info'. You'll see two boxes: one for 'Local host' and another for 'IP address'. These contain incorrect information that you

need to disconnect from IRC and then reconnect. Everything should then work fine.

**Q** PCW has recently been featuring ISPs but one critical point is

never mentioned in your column, or elsewhere. Some of us are still running plain DOS! Which of the Internet Providers can offer a full web service via a DOS connection? Until retirement I had a perfectly good DOS connection though a university Unix system running the Lynx browser. Now, in the hard commercial world, this is not so easy. Demon has a useful DOS dialup service (KA9Q) but it does not effectively provide web access. Former public Lynx servers no longer allow access. Surely there is some ISP prepared to offer a simple DOS dialup service providing text-only access to the web?

**a** You're right that the net shouldn't be limited to people with Windows or Macintosh systems — and it's



## Questions

### & answers

still not. But you can gain access. There is a DOS version of Lynx which should work with the Demon Internet software but a better solution is called Arachne. It's a fairly full-featured web browser from the Czech Republic which includes ftp and email clients, and also a PPP dialler. As long as you have the appropriate login information you should be able to make it work with most Internet Service Providers. Best of all, just because it runs under DOS or a compatible operating system, you don't have to be restricted to text. Arachne is a graphical browser which supports a subset of HTML 4.0 including tables, frames, forms and imagemaps, and there are also plug-ins for playing sounds and some types of video file. You can find out more about Arachne or download a copy from [www.arachne.cz](http://www.arachne.cz).

**Q** I was wondering if you could tell me whether it's possible to get a 'personalised' Error 404 page. For example, if you go to [yahoo.com/randomword.htm](http://yahoo.com/randomword.htm) it will come up with a yahoo page saying 'Not found, click here to search...'. Is there any way to get a page like this for my web site which can return people to the home page (using meta refresh, etc) or does this require a load of additions to the server?

**a** You cannot configure your own options for this if you are sharing space on an ISP's server. Typically, the error pages that are returned are set on a global basis for each web server. On some

servers they may simply be generated on-the-fly. Other servers, though, will allow you to specify your own error pages and this is what Yahoo and other sites do. You can even specify a program to be run when an error occurs which

to have to pay commercial rates for web space.

**Q** I have a 56Kbps V90 modem. When I download files from the internet they download at around 3.1Kbps and not at 56Kbps. I know you mentioned this in the October '98 column but I do not understand the technical details. When I bought my modem, I

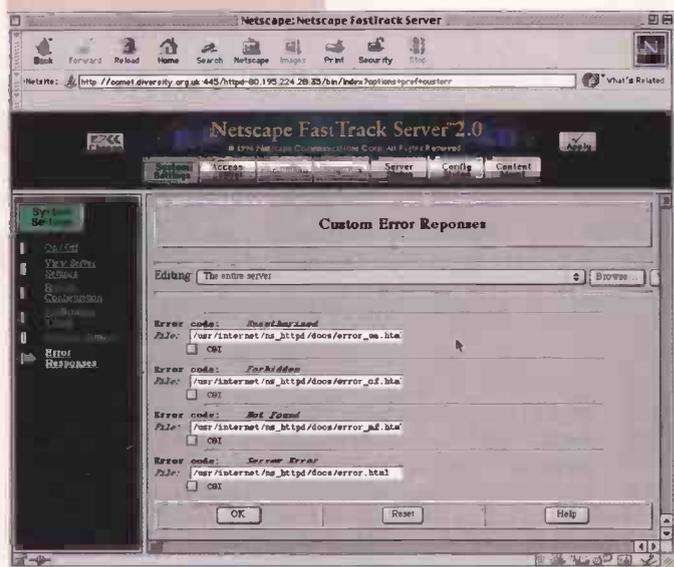
connection has been made at, for example, 57,600bps it is often only the speed of the serial link to the modem that is given. To find the true speed of the modem connection you need to interrogate the modem, usually with the AT command although options vary from one manufacturer to another. The other big problem is the speed of the rest of the internet.

As I have stated here before, the cost of a permanent connection for hosting a web server is very expensive in the UK. You will find a lot of web servers that are sitting on the end of relatively slow links — or slow links between you and a fast server. You may well have a fast connection to your ISP's modem but if there are bottlenecks elsewhere, that is going to slow everything down. You can sometimes see whether this is the case by trying to download something from elsewhere. If you can run a download at,

say, 2Kbps as well as the one at 3.1Kbps, then you are probably making good use of the modem and the bottlenecks exist elsewhere.

It is an unfortunate fact that until the permanent links which people need for service web pages become cheaper, one of the biggest things you will receive from those with fast modems, ADSL, or cable internet at home is not speed but unfulfilled expectations of it.

**▼ FIG 2** MODERN WEB SERVERS SUCH AS NETSCAPE AND APACHE ALLOW YOU TO SPECIFY CUSTOM ERROR PAGES EITHER FOR THE WHOLE SERVER OR JUST PART OF IT



could, for instance, tailor the error page to whatever the user was trying to do, or to the type of browser they were using. Depending on the type of server on which your pages are hosted, you might be able to set something up but you'll need the assistance of the server administrator who will have to change appropriate options. For example [Fig 2] shows the Netscape FastTrack server which allows special pages to be specified for different errors. You can also have a different group of pages for a sub area on the server, such as a single user's home page. If you want this sort of facility, though, the chances are that you are going

was expecting much faster download rates than I am getting.

**a** There are many reasons for this. The most important is that the speed quoted for any modem is only a theoretical maximum. If there is any noise, even things you can't hear, on the phone line you will have problems. Check the speed of the connection between your modem and the PC. This should be as fast as possible — ideally 115,200 bps, or more if you have a serial card which can handle it. When people report that their communications software tells them a

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# Sonic boon

**Tim Nott hears of a new file player to put good sounds on your PC. Plus, audio standards.**

One of the bits of unofficial showing-off by the Windows 95 interface team was the clock which came with Powertoys. Nothing really remarkable about it except that it was round — a porthole, if you like, rather than a rectangular window. There's no reason why windows should be rectangular, either in operating systems or architecture, so when I was digging through the Litestep site for last month's *Hands On* I was rather impressed by a strangely-shaped thing in some of the screenshots. What, I asked one of the creators, is that? It turned out to be a music player called Sonique.

Sonique has a variety of interesting shapes ranging from a tiny little roller that unfolds to display controls when the mouse pointer passes over it, to a fully-fledged console with a drop-down graphic equaliser.

**My personal favourite** is the rather organic shape shown in Fig 1. If Kai Krause, the doyen of digital imaging, and designer Philippe Starck teamed up to conceive a personal



◀ **FIG 1 SONIQUE — THE FREE-FORM MUSIC PLAYER**

stereo, then it would probably look something like this.

Although it will play individual tracks from audio CDs it's essentially a file player and will work with a variety of formats including MPG123, MP2, MP3, MOD, XM, IT, PLS and S3M as well as the more mundane WAV. As well as playing music you have loads of knobs to twiddle and besides the graphic equaliser mentioned earlier you can change the pitch, juggle playlists and engage in all sorts of arcane activities, with options. There's also a variety of visual effects you can have pulsating away to the music. At the time of writing there is no help file so it's very much a case of playing around to see what happens. Also, Sonique was still in beta and the expiry date meant I couldn't include it on our cover-mounted CD-ROM. You can, however, download a free trial version from [www.sonique.com](http://www.sonique.com).

**Having got the player**, it made sense to get something to play on it — it's surprising how quickly one can get bored with TADA.WAV and the Microsoft Sound.WAV. If these file extensions don't mean much to you, well, they don't to me either, except for MP3.

MP3 audio compression standard provides good quality music in around a tenth of the storage space of conventional CD-Audio. As such, running at around a megabyte a minute, transferring music across a modem link becomes a viable possibility. Although it takes a lot longer to download than a 'streamed' format like Real Audio, the difference in quality is astounding: it's like comparing Bang and Olufsen with a wind-up Victrola gramophone.

There is a huge number of MP3 tracks available free, as well as a number of pay sites and although the Sonique site has plenty of links, [www.mp3.com](http://www.mp3.com) is probably as good a place to start as any. Here you will find well-known artistes as well as lesser-known bands. Among the latter I found God Ate My Homework, not so much a garage as a bicycle shed

## READERS' TIPS

An unusual twist on the long-running 'Shutdown blues' saga. M. Davison reports the case of a colleague whose 'Please wait...' screen was never replaced by the 'It is now safe...' version. The reason? Some bright spark had copied the first screen file (LOGOW.SYS) over the second (LOGOS.SYS).

**Autorun** is another old favourite. Henry Brown's CD-ROMs wouldn't but Audio CDs would. When he mailed me he'd already tried the usual remedies. I won't repeat them here as they can be found in the back issues on our PCW CD-ROM. I wasn't able to help so he tried the Gateway user forum, where a very nice sysop suggested he run Regedit and go to HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\NoDriveTypeAutoRun. This key should have a value of 0000 95 00 00 00. Somehow — and the culprit has yet to be found — this had got changed on Henry's machine to 0000 75 00 00 00. Changing it back cured the problem.

band, whose seminal work 'Secret Asian Man' contains the immortal lines: 'He is playing Mahjong As he downloads from Hong Kong, Where today it's already tomorrow'.

But surely, you ask, what is to stop unscrupulous types from pirating copyright material? Well, just as there is pirated software, pornography, racist propaganda and terrorist manuals available on the web, so there is also bootleg

**You can engage in all sorts of arcane activities, with options**

music and unless you live an extraordinarily sheltered life you'll realise that you can get all these things on traditional magnetic, optical or paper media anyway. However, it is not compulsory to download stolen music but I dare say it makes good copy for the more webophobic among the press.

Sites such as [www.mp3.com](http://www.mp3.com) are, in fact, extremely conscientious about





# Questions

## & answers

**Q** I've just added a second hard disk and relocated the 'My Documents' folder on it. I then redirected the 'Send to...' command but instead of moving the highlighted files to the new 'My Documents' it copies them, leaving the originals behind. Although the 'Send to any folder...' Power Toy tool works it always prompts for a destination. Any ideas?

MALCOLM CHERRIE

**a** Yes. If you hold down the Shift key when you use 'Send To...' the files will be moved (shifted, geddit?) rather than copied.

**Q** Some time ago you gave details of a program that would reveal the 'real' password you see as a row of asterisks in, for example, the DialUp Networking login. I have looked through back issues of your magazine on CD-ROM (honest!) with a variety of keywords including 'password' and 'asterisk' but have failed to find it.

NEVILLE FAIRBAIRN

**a** That's probably because it was in the December '97 column which cycled off the CD in the January '98 issue. Anyway, the program you want is Revelation 1.1 which is available free from [www.snadboy.com](http://www.snadboy.com)

**Q** How can I stop the annoying warning that 'Modifying the contents of this folder may cause your programs to stop working correctly' when I open, say, the Windows folder? Is there a way of by-passing the clicking on 'Show files'?

JEREMY CASTLE

**a** The easy way, having once shown the files, is to uncheck 'View as Web page' from the View menu. Then make sure that 'Remember each folder's view settings' is ticked in Explorer's View, Folder Options, View. You'll lose the little preview as well as the details area to the left of the file list but you can usually get those from right-clicking

off... entries at the same time. They are all in the IE4 tab [Fig 3].

**Q** I have recently upgraded to Windows 98 and I like the new Quicklaunch toolbar but it has a tendency to swap its icons around so, for example, the button with the Notepad icon actually launches Paint. It can get very confusing. Is there a way of taming this?

COLIN DECKER

**a** This is a common complaint. I do not know why it happens but you can restore the icons by right-clicking on an empty part of the toolbar and then choosing 'Refresh'.

**Q** I seem to remember that you printed a tip a while ago on how to get another instance of Explorer running just after it crashes — i.e. all the system tray icons disappear. Could you refresh my memory?

PETER GEDDES

**a** I certainly can — you just press Control + Alt + Del. Then select Explorer — not Exploring — from the list and click 'End Task'. The Windows Shut Down confirmation will then appear. Cancel it. Wait. In due course, a 'Not Responding' dialogue will appear. Click the 'End Task' button. The Taskbar and Desktop icons will momentarily disappear then reload. You will not get the tray icons back, however, without restarting Windows normally.

**Q** How can I persuade Internet Explorer just to download Zip files rather than attempt to open them?

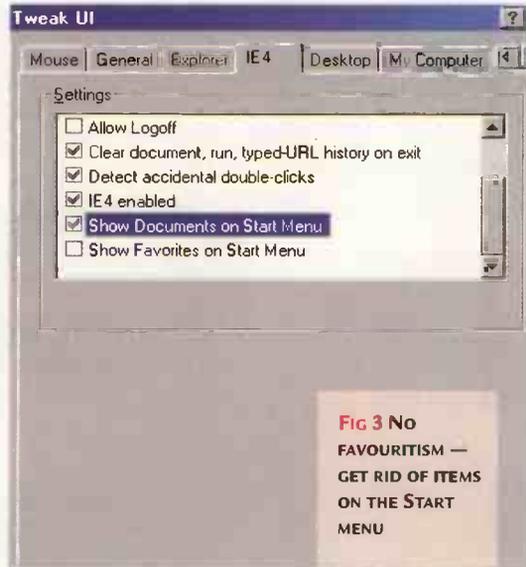
ALAN BUNTING

**a** From Windows (rather than Internet Explorer), go to Options (a.k.a. Folder Options) on the View menu and select the File Types tab. Select the WinZip file type, hit the Edit button, then tick the 'Confirm open after download' checkbox.

**Q** I made a custom launch bar, similar to the Windows 98 Quicklaunch bar, in the Taskbar. It has now sunk without trace. Is it possible to get it back or do I have to start from scratch?

DELPHINE MOREAU

**a** A custom toolbar is just another way of looking at a folder. When you create a new toolbar you are asked to browse to an existing folder. As long as you haven't deleted the folder you can get the toolbar back by right-clicking on a bare bit of Taskbar, selecting Toolbars, New Toolbar and browsing to the folder. The bad news is that when you close a toolbar either from its own controls (where you get asked to confirm) or from the Toolbar list (where you don't) this removes it from the list permanently — unlike the Quicklaunch, Address, and other built-in bars — so you have to go through the ritual above to re-open it. Worse, any custom settings you made such as ordering the icons or hiding the text will be lost.



QuickView or Properties. For a far more complicated way of doing it, see Ian Briscoe's contribution on page 227.

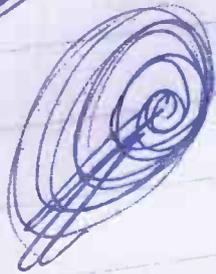
**Q** Can I get rid of the 'Favorites' entry on the Start Button in Windows 98?

MIKE DURIE

**a** Yes. The Windows 98 version of TweakUI will let you do this. You can also get rid of the 'Documents' and 'Log

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 Tim Nott can be contacted via the PCW editorial office (address, p14) or email [win@pcw.co.uk](mailto:win@pcw.co.uk)

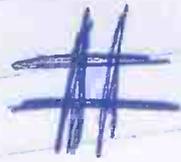
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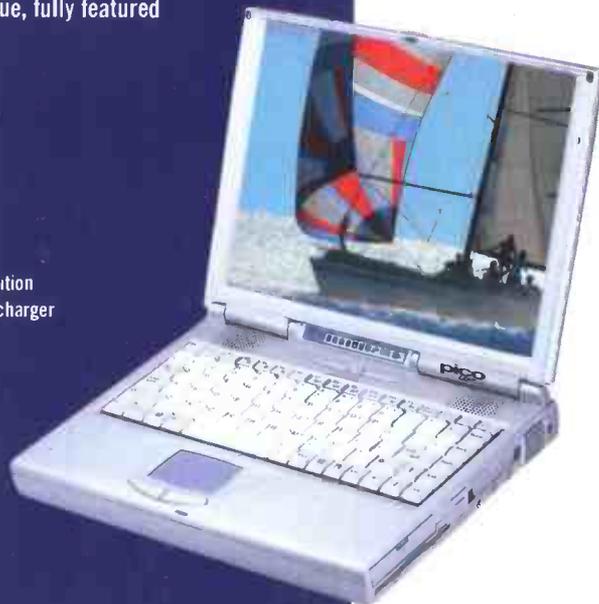
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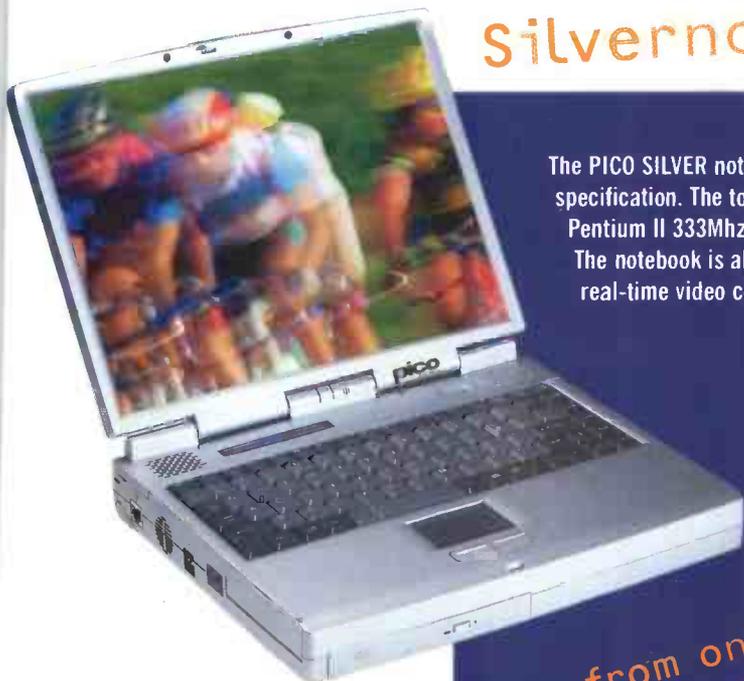
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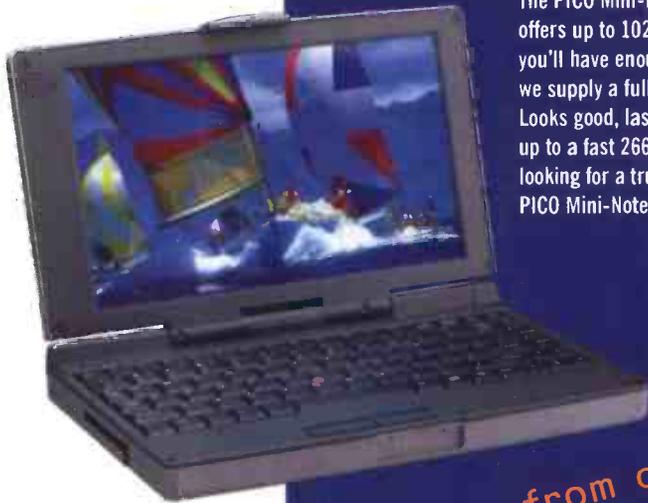
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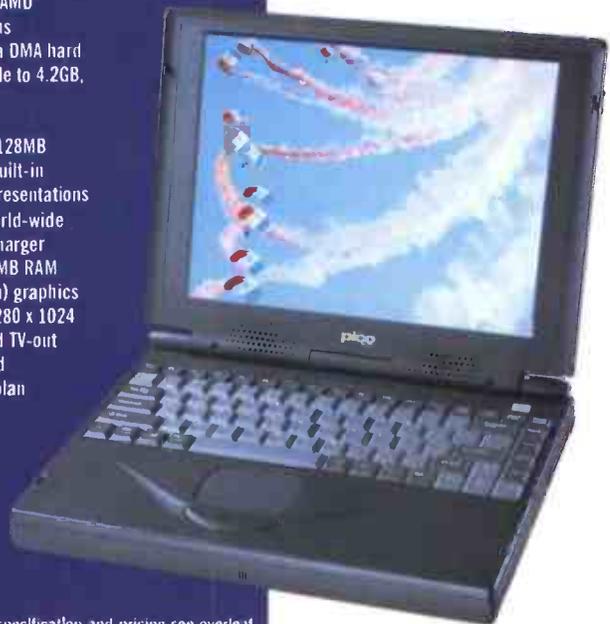
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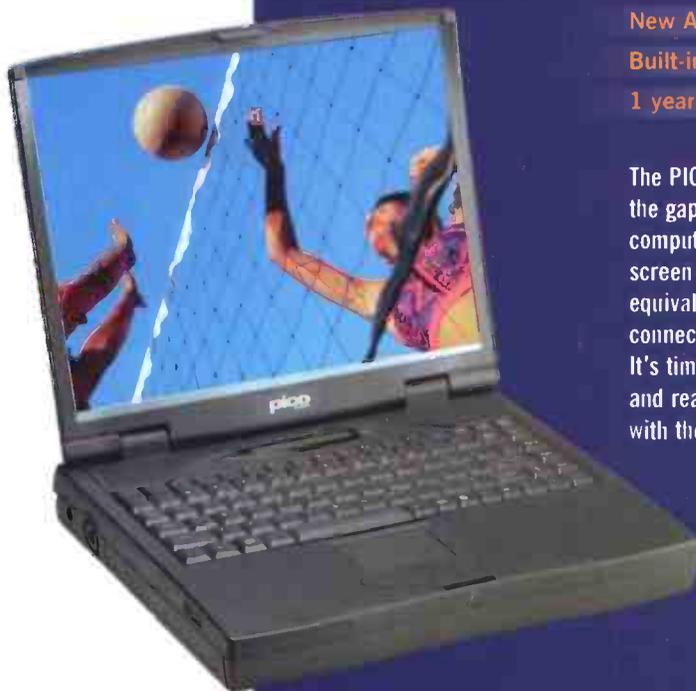
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98-300-K6	AMD K6 300	£779	£879
98-266-K62	AMD K6-2 266	£789	£889
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- Keyboard (PS2)
- Parallel (EPP/ECP)
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- 24 x CDROM
- Built-in trackpad
- 309mm (w) x 257mm (d) x 54mm (h)
- Weight 3.6 Kg (8 lbs)
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- External microphone and speaker jacks
- Lithium Ion battery
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MODEL	PROCESSOR	14.1" TFT	14.1" E TFT
9800-233M	Intel P233MMO	£1069	£1269
9800-266M	Intel P266MMO	£1119	£1319
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9800-PII-266	Intel PII266	£1219	£1419
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- Keyboard (PS2)
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- Serial (16C550)
- 24 x CDROM
- Built-in trackpad
- 315mm (w) x 245mm (d) x 45mm (h)
- Weight 3.3 Kg (7.2 lbs)
- Built-in 3D sound
- External microphone and speaker jacks
- Lithium Ion battery
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66-233M	Intel P233MMO	£ 969	£1039
66-266M	Intel P266MMO	£ 989	£1059
66-PII-233	Intel PII233	£1039	£1109
66-PII-266	Intel PII266	£1089	£1159
66-PII-300	Intel PII300	£1139	£1209
665-PII-266	Intel PII266MMC2 AGP	£1139	£1209
665-PII-300	Intel PII300MMC2 AGP	£1229	£1299
665-PII-333	Intel PII333MMC2 AGP	£1319	£1389

Configured with 3.2Gb removable/upgradable HDD and 64MB SDRAM

## Desknote

- 2 x Type II or 1 x Type III PCMCIA slots
- PCI Bus
- Intel 440BX chipset
- External monitor port
- DVD or LS-120 drive or zip options
- Keyboard (PS2)
- Parallel (EPP/ECP)
- Serial (16C550)
- 24 x CD ROM
- Built-in trackpad
- 316mm(w) x 259mm (d) x 55.5mm (h)
- Weight 3.4Kg (7.5 lbs)
- Built-in 3D Yamaha sound
- External microphone and speaker jacks
- Lithium Ion battery
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979-266MMO	Intel P266MMO	£ 999	£1069
979-PII-233	Intel PII233	£1049	£1119
979-PII-266	Intel PII266	£1099	£1169
979-PII-300	Intel PII300	£1149	£1219
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- Built-in sound card
- External microphone and speaker jacks
- NiMH Battery
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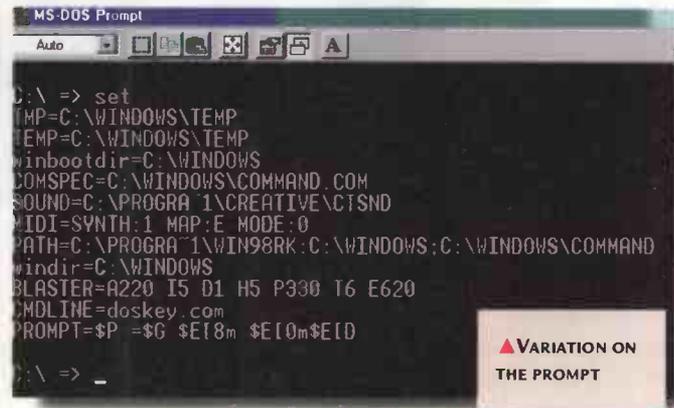
# ESCape from the dark

Don't DOS in the dark. Roger Gann puts **colour** into your screen with help from the ESC character.

**V**isually, the DOS environment is pretty dull. For most users it's all black and white, but it's easy to inject some colour into it courtesy of a seldom-used DOS device driver, ANSI.SYS. Even better, this little driver lets you perform other useful tricks, too. ANSI.SYS provides extended screen and keyboard control to any application which uses DOS functions for its input or output. Like other device drivers, it's installed at boot time from the CONFIG.SYS file. The ANSI driver gives access to the ANSI functions only to programs which use DOS services for I/O. For performance reasons most DOS applications by-pass DOS I/O, either by using the BIOS or addressing the hardware directly. However, one program which benefits from ANSI.SYS is the DOS command line interpreter, COMMAND.COM.

**ANSI works as a console filter** and looks for an 'escape sequence' as its cue to perform a special task. Each ANSI sequence begins with two characters: an ESC followed by [, the left bracket. The ESC character (*not* the letters, E-S-C) stands for the control character, decimal 27 (Hex 1B). ESC is among the 32 characters in the ASCII table which appear before the first text character (the space, character 32). These initial characters are known as control characters as they are used to control devices, like printers. ESC is CTRL-[, often printed as \*[,. The ASCII on-screen interpretation is a small left arrow.

Thanks to ANSI.SYS you can specify screen colours and resolution, control



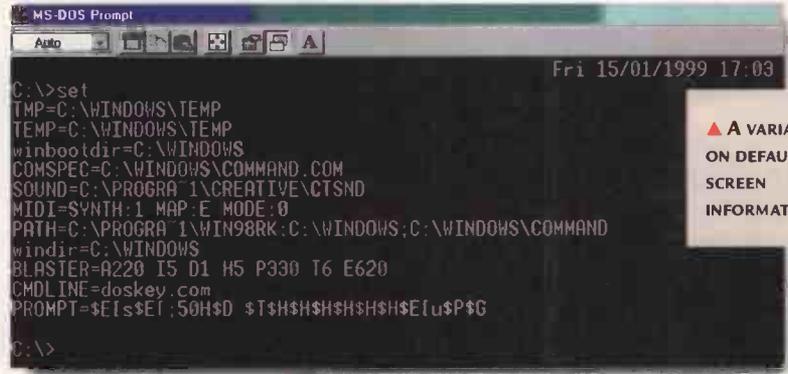
the cursor, clear the screen and remap specific keys. The ANSI control sequences have the general format: **ESC[PARAMETERSCOMMAND**. The left bracket is the second control character and is followed by the parameters for the specific ANSI command. These parameters are either a decimal number or a literal string.

**➤ The elusive ESC**  
There's one small problem with the ESC character. As it is a control character it is not meant to be printed on paper, nor on-screen. You can't just hit an Esc key to generate it. A word processor is no great help here. You need a much simpler text editor for this task.  
Here's the trick. Using MS-DOS EDIT, you can generate the elusive ESC character by pressing CTRL-P and then hitting the Esc key. On screen you'll see it represented as a left-pointing arrow.  
Die-hard EDLIN users have to employ a different trick: in EDLIN you press CTRL-V and then the left bracket [. This is potentially confusing though, because

the good old left bracket already features heavily in ANSI escape codes and it can look like you've got too many brackets in your command string. In this way you can create a simple text file comprising the

required escape codes and just use the TYPE command to execute them. However, a simpler way is to use the much-neglected PROMPT command which lets you summon the ESC character from the command line.

**➤ Customise the prompt**  
Beginning with MS-DOS 2, Microsoft allowed you to customise the DOS prompt to make it more descriptive. But this goes beyond merely labelling sub-directories, it lets you include all sorts of other information in the prompt as well. The key to changing the prompt is the PROMPT command which can be included in your AUTOEXEC.BAT or simply typed at the command prompt. Its syntax is:  
**PROMPT [PROMPTSTRING]**  
where [promptstring] is the string which defines the appearance of the prompt. This comprises one or more metacharacters, prefixed by a \$ sign:  
\$B Piping operator (|)  
\$D Current date  
\$E Escape character  
\$G Output redirection operator (>)  
\$H Backspace (delete previous character)  
\$L Input redirection operator (<)  
\$N Current drive  
\$P Current drive and directory  
\$Q Equal sign (=)  
\$T Current time  
\$V DOS version number  
\$\$ Dollar sign  
\$\_ Carriage return  
The metacharacters can be lower or upper case. So, to have a prompt that





# hands on

## 16-bit

includes the drive and sub-directory details you'd type:

```
PROMPT $P$G <CR>
```

Since MS-DOS 6, this has become the default prompt and it's fine as far as it goes, but thanks to the wide range of prompt metacharacters and some screen manipulation commands that you get when you load ANSI.SYS, you can go completely crazy with the prompt and devise some really fancy ones.

**Here's one** that's a little over the top. To make it work, be sure that you have the ANSI driver loaded in CONFIG.SYS: `DEVICE=C:\DOS\ANSI.SYS`

Note that because the following prompt string is so long, you may run out of environment space when you try to run it. If you do, add this line to your CONFIG.SYS file:

```
SHELL=C:\DOS\COMMAND.COM /E:1024
```

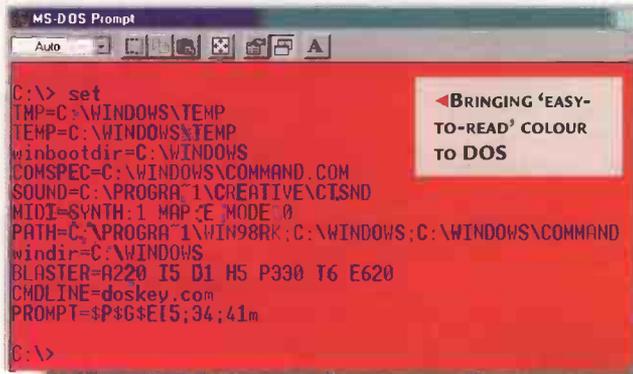
(✓ code string continues)

When you reboot, your environment will be expanded from its default of 256 bytes to a more reasonable 1,024.

```
Then type this in at the prompt or add it to your AUTOEXEC.BAT:
PROMPT $E[B$E[s$E[H$E[K$E[1
;33;44m$E[K$E[1C$P$E[1;30
$V$E[1;66H$D$E[0;1;37;40m$E[u$G
```

(✓ code string continues)

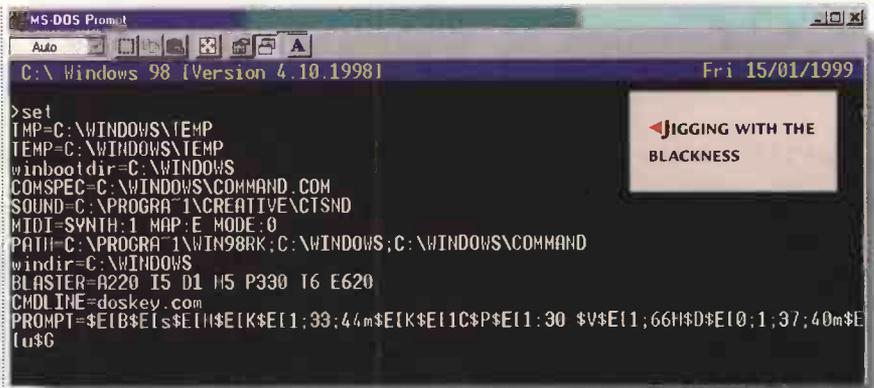
If you type this line in carefully at the prompt you should get a blue bar at the top of your screen. It will contain yellow text, comprising the current drive and



directory, the version of DOS you are running, and over on the right it will tell you the day and date. Underneath will be a 'greater than' symbol — your prompt.

**Here are some other prompts** you may like to try:

```
PROMPT $P = $G $E[8m $E[0m$E[CD
```



```
PROMPT $E[s$E[50H$D
$T$H$H$H$H$H$H$E[u$P$G
(✓ code string continues)
```

As ever, watch the capitalisation. This kind of jiggery pokery also works fine under Windows 98 as well as MS-DOS 6.2. If you want info on the various keyboard scan codes and other features of ANSI.SYS check out the on-line help for ANSI.SYS under MS-DOS 6.2 or the text file, MSDOSDRV.TXT in the Windows 98 C:\WINDOWS folder.

### Colour or black and white?

While we're on the subject of colour, even on a colour screen DOS will default to boring old white text on a black background. But if you have the ANSI.SYS driver installed and send the appropriate escape codes to it, then the CLS command will clear the screen to the colours you selected. So, for example, the command

```
PROMPT $E[1;37;44m
```

displays bright white text on a blue background. Once again, if you use the PROMPT command to change the screen colours, you will need to reset your DOS prompt with another PROMPT command.

Here follows the syntax for changing DOS

```
screen colours:
ESCCSTYLE;TEXTCOLOUR;
BACKCOLOURm
(✓ code string continues)
```

Note that the final m at the end must be in lower case. Simply replace STYLE;TEXTCOLOUR and BACKCOLOUR with three numbers.

- There are three Style options:
  - 0 = Normal prompt
  - 1 = Bold prompt
  - 5 = Blink prompt
- The TextColour variable must be replaced with...
  - 30 = black (grey if bold was set) text.
  - 31 = red text
  - 32 = green text
  - 33 = orange (yellow if bold was set text)
  - 34 = blue text
  - 35 = magenta text
  - 36 = cyan text
  - 37 = white text
- ...and the BackColour variable must be replaced with:
  - 40 = black background
  - 41 = red background
  - 42 = green background
  - 43 = brown background
  - 44 = blue background
  - 45 = magenta background
  - 46 = cyan background
  - 47 = white background

For example, to get blue blinking text with a red background, the command would be:

```
PROMPT $P$G$E[5;34;41m <CR>
```

Coincidentally, a vigilant reader, 15-year-old Arvinder Sehmi sent me a long email reminding me of the colour options available using ANSI escape codes, together with a little executable he had cobbled together to simplify this task. You'll find COLOUR.ZIP on our CD.

Don't forget that these commands only affect the DOS session. Most DOS apps will re-initialise the screen when they load and will set their own colour scheme, re-imposing the default B&W scheme on exit.

## PCW CONTACTS

Roger Cann can be contacted via the PCW editorial office (address, p14) or email [16bit@pcw.co.uk](mailto:16bit@pcw.co.uk)



# Standard practice

Don't worry about **implementing TCP/IP** on an NT network. Andrew Ward offers sound advice.

**T**CP/IP has been the default networking protocol for Windows NT for some time and is now virtually the standard protocol used on any network. But many people from a Windows for Workgroups or PC background, rather than Unix or enterprise, are unsure about how to implement it on a Windows NT network.

For larger networks, you really need to read one of the many books on the subject and go for the whole gamut of DHCP, DNS servers and so on. For a small network with only a handful of machines on a single network segment, TCP/IP with Windows NT is extremely easy. Never believe anyone who insists that you need to implement and maintain the horrendous old-fashioned HOSTS or LMHOSTS file mechanism, or use WINS, or add other protocols besides TCP/IP.

**If you have a server** which you are going to rely on as being available all the time, you can save a huge amount of hassle by using DHCP, but unless you

know that the server is going to be there whenever you need to use the network, it's safer to use manual IP addressing.

There are several IP address ranges specifically reserved to be used on internal networks (such as 192.168.0.1 to 192.168.255.254) and you should use one of these. You don't need to worry about DNS on a small network.

If you intend to access the internet and you don't have your own real internet IP addresses, it is quite

safe to use one of the reserved ranges as long as your net access device, be it a Linux system or a dedicated router, implements masquerading, NAT (Network Address Translation) or a similar scheme. Then, DNS resolution for internet sites will be taken care of by your ISP and you can usually use the same device as your DHCP server. Within your own network, however, you'll want to refer to servers and other systems by their usual names — SATURN, MARS, VENUS — or whatever nomenclature you've chosen, which are actually the NetBIOS names.

If you don't use DNS or haven't set up a HOSTS file, nor implemented the

NetBEUI protocol you may well be wondering how this works. The answer is B-node broadcasts or, more specifically, Microsoft Enhanced B-node broadcasts.

Let's say you want to access a resource on the machine known as VEGAS. What happens is that your workstation first looks in the local cache for this name. Only if it can't find it does

it send out a broadcast, known as a B-node broadcast, on the local

network specifying the NetBIOS name you want to resolve. The system named VEGAS will respond with its IP number and then your workstation can store this information in the local NetBIOS Name Cache for future use. Interestingly, if the remote system doesn't respond, which probably means it's not working, you're not really going to get much further anyway, and Windows NT will look in the LMHOSTS file.

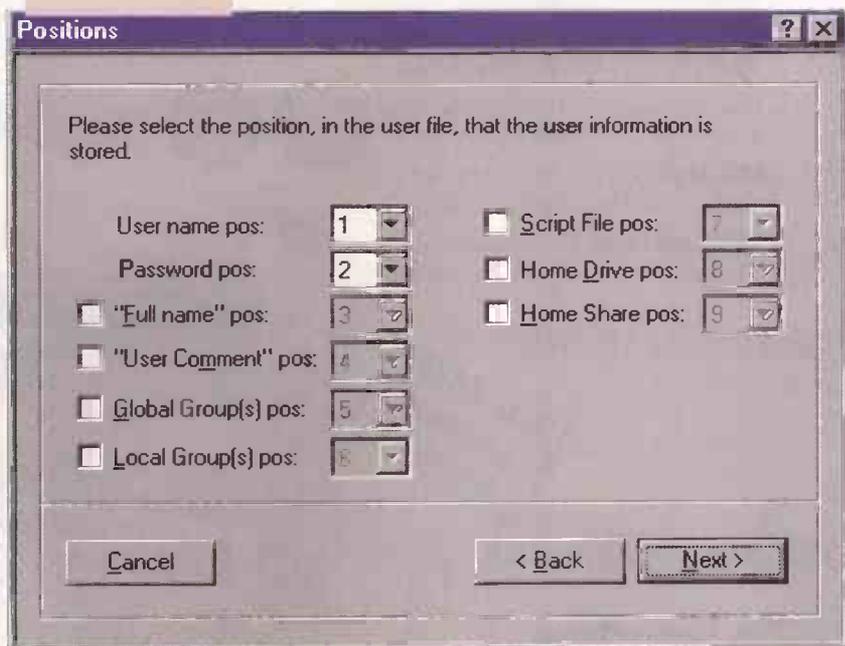
**On small networks**, this scheme works well, but as soon as you introduce multiple subnetworks and routing you enter into all sorts of complications — for example, B-node broadcasts are not normally passed on by routers and the whole thing falls apart. By the way, don't worry about the network traffic generated by these broadcasts. It only happens the first time you reference an external NetBIOS name following a reboot.

When you do get to a larger network you're probably better off avoiding NetBIOS names altogether and using DNS-style machine names and a DNS server. Apart from anything else, this will prepare you for Windows 2000 implementations where the forthcoming Active Directory structure mirrors the domain naming scheme.

## Network oddities

Networking hardware is unreliable even in the normal course of events when there's nothing specifically wrong. Software has to be able to cope with this unreliability by carrying out retries and

▼ **FIG 1** ADDING USERS TO THE NT SAM USING SAM USING NMUM



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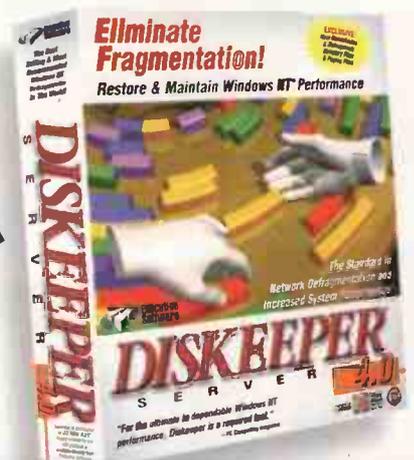
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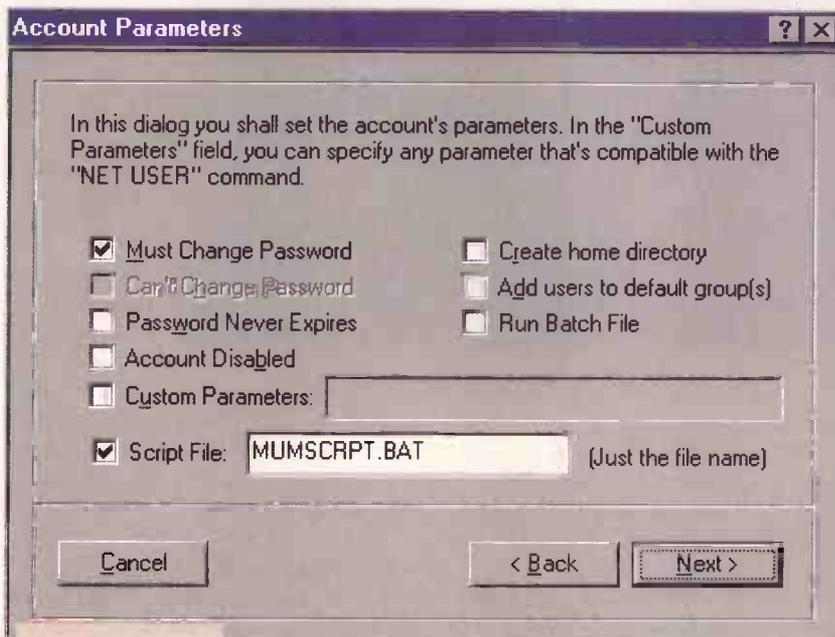
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**▲ FIG 2 WITH NMUM, YOU CAN SPECIFY THE VARIOUS USER OPTIONS REQUIRED**

Windows NT does this very well — sometimes

rather too well — and many people have problems with what appear to be obscure network errors.

For instance, a problem readers frequently come up with is that while it's possible to see a remote system when browsing the network, they get an error when they try to do something more adventurous like connecting to a share. They may even be able to establish a connection but then receive errors when transferring huge amounts of data, when backing up over the network, say.

The problem they're running into here is that even though there is an underlying network hardware problem with the cabling, or maybe one or more of the network cards, the software is able to mask it sufficiently well that at first sight the network appears to be working.

A useful tip is that if you can see a machine when browsing, you shouldn't automatically assume that the network is fully working. You shouldn't be afraid to try changing network cabling and network cards.

➤ **Adding users**

James Roberts-Thomson is one of several readers who have pointed out that the Resource Kit ADDUSERS command is an excellent way to add user accounts from a CSV (comma-delimited) file of user names. ADDUSERS will also dump

existing account details from the SAM, although without showing passwords. In fact, the dump feature is immensely helpful because it shows you the file format and headings you need to use when creating your own file of additional user names.

Another option is to delete existing accounts. Hence, with the help of a few cute scripts, someone working in an academic environment, say, could easily construct a mechanism to clean out all leavers and set up accounts for those starting a new course.

Another tool which can be useful in these circumstances is NMUM, or Multiple User Manager for Windows NT [Figs 1&2], written by Anders Wahlin. Its features include these abilities:

- Creating multiple users from a text file, including home directories etc
- Changing password for /disable/rename /enable multiple users from a text file
- Dumping information about the accounts/groups/shares into a text file
- Sharing multiple directories using their names
- Adding/removing multiple users/groups to and from the ACL of multiple files/directories

For those who prefer a GUI tool with wizards to the command-line world, NMUM is a boon. It takes you step-by-

step through the options to create files from user information in the SAM, or vice-versa. NMUM can be downloaded from [www.winsite.com/info/pc/winnt/sysutil/nmum25.exe](http://www.winsite.com/info/pc/winnt/sysutil/nmum25.exe).

➤ **Changing drives**

Another hint from James Roberts-Thomson would be of help when changing drives. (To refresh your memory, the original problem was the easiest way to back up the registry on a system where the hard drive is going to be replaced).

The Resource Kit includes two utilities, REGBACK and REGREST, which make backing up the registry much easier. Specifically, REGBACK [Fig 3] will backup the registry live and online and you can then use REGREST to restore as much as required to a new installation.

➤ **Finding the phantoms**

Many people have experienced problems with routers (or the built-in DUN auto-dial) being brought online by phantom events. In my own case, the ISDN router log tells me that one of the systems on my network brings the router up at midnight and at 4am every day, but I can't fathom out why.

Reader Peter Edgley has thrown some light on a few of the phantom accesses he's been experiencing. When he checks the log of his ZyXel Prestige 100 router he notices that some of the packets causing the router to come up include the ASCII text WORKGROUP. And, like most of us, he has a workgroup called, er, WORKGROUP.

Unfortunately, not all routers will log the packet contents, so not everyone will be able to use this technique to track down errant processes. But if you can, you have a number of techniques at your disposal to prevent phantoms.

**There are techniques at your disposal to prevent phantoms**

disposal to prevent phantoms.

Firstly, be sure that you've turned off anything optional you can

find, such as the ability to route NetBIOS packets. Then you can use the filtering facilities of the router, suggests Peter. Decode the source and destination addresses, the packet type and the port numbers from the packet header and then create a filter based on this information.

Peter's other suggestion has prevented the WORKGROUP packets



```

Command Prompt
d:\
>regback c:\temp
saving SECURITY to c:\temp\SECURITY
saving SOFTWARE to c:\temp\software
saving SYSTEM to c:\temp\system
saving .DEFAULT to c:\temp\default
saving SAM to c:\temp\SAM

***Hive = \REGISTRY\USER\S-1-5-21-1290939513-2096893924-324685044-1004
Stored in file \Device\Harddisk1\Partition1\WINNT\Profiles\andrew\NTUSER.DAT
Must be backed up manually
regback <filename you choose> users S-1-5-21-1290939513-2096893924-324685044-1004
4

```

**◀Fig 3 REGBACK FROM THE RESOURCE KIT WILL ONLY BACK UP REGISTRY HIVES THAT ARE CURRENTLY OPEN AND IN USE**

from bringing up the router, although one suspects that turning off NetBIOS routing would achieve the same thing. What he has done is to manually add an entry to the HOSTS file on the Windows NT system with an entry referring WORKGROUP to the local machine or any address on the local subnet. For example:

```
192.168.169.2 WORKGROUP
```

Another reader, Chris Bennett, has written in with some observations on the causes of phantom dialling. In certain circumstances, some Office applications, have a habit of storing document and template references as UNC filenames. This is fine until you move the document elsewhere on the network — say to the other end of a dialup link. Then, when you open the document, even though it is now actually stored on the local hard drive it will cause accesses across the network. Similarly, when setting up shortcuts on a roaming desktop be sure that they, too, do not explicitly reference applications on the machine on which the desktop was originally configured but use a relative reference that will work entirely locally.

Please continue to write in with any causes of phantom dial-ups you've identified.

### ➔ Exploring

If you work from within the Windows NT Explorer, rather than the command prompt, you have a problem once you find a file that you want to edit, unless

the file type is already associated with an editor such as Notepad.

From the command line you can just type in 'edit filename.type' but unless Notepad is already associated with the file type in question, you're stuck with the tedious 'Open with...' dialog.

To overcome this problem, there are two ways which allow you to easily edit files using the menu you get when you

association already exists for a particular type, 'Open with Notepad' won't appear automatically. To force it to appear, hold down the shift key before you click the right mouse button.

### ➔ SUBST again

In the February issue, I pointed out how if you wanted to avoid maintaining vast numbers of shares on your server to

an association for unknown file types so, where an

**[FIG 4]**

### A right-click menu item for editing files with notepad

```

[HKEY_CLASSES_ROOT\Unknown\shell\Open with Notepad]
[HKEY_CLASSES_ROOT\Unknown\shell\Open with Notepad\command]
@="D:\WINNT\notepad.exe %1"

```

right-click on a filename.

The first technique uses the SendTo menu. Simply by adding shortcuts to your SendTo directory — which will be located somewhere like 'D:\WINNT\Profiles\andrew\SendTo' — you can extend the SendTo menu at will. I've added a shortcut to Notepad but named it '01 Notepad' so that it always appears first in the list (the list is shown in alphabetic order).

This works for any file type but requires that you wind down to the Send To submenu. An alternative procedure will add an entry to the standard right-click menu, thus avoiding this step. Simply copy the text shown in Fig 4 into a file called, say, EDIT.REG and then double-click on this filename to cause the information to be entered into the

registry. Of course, you'll have to change the path to NOTEPAD.EXE to match your system. Unfortunately, using %System-Root% in this context doesn't work. This creates

support personal user directories you could use the SUBST command with the %username% argument in users' logon profile. Reader Chris Ahchay has sent further information on the SUBST command, observing first of all that it can use the environment variable %LogonServer%. So, your user profile command could be something like the following which is, of course, far more generic than my previous example:  
SUBST F: %LogonServer%\UserShares\%UserName%  
(Code string continues)

On the down side, Chris points out that SUBST mappings are retained after logout — associated with the workstation rather than the logged-on user — until the next reboot. If this is undesirable, remember that NTFS permissions will prevent a different user accessing a drive mapped by a previous one, Chris suggests including the code shown in Fig 5 within logon scripts.

**[FIG 5]**

### Deleting SUBST drives at login time

```

SUBST | FIND "F:" > NUL:
IF NOT ERRORLEVEL 1 GOTO SubstDrive
SUBST F: /D
:SubstDrive
SUBST F: \\VEGAS\UserShares\%UserName%

```

### PCW CONTACTS

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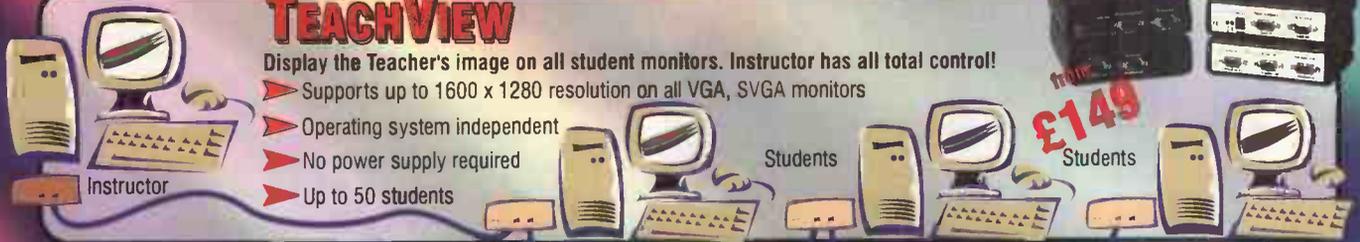
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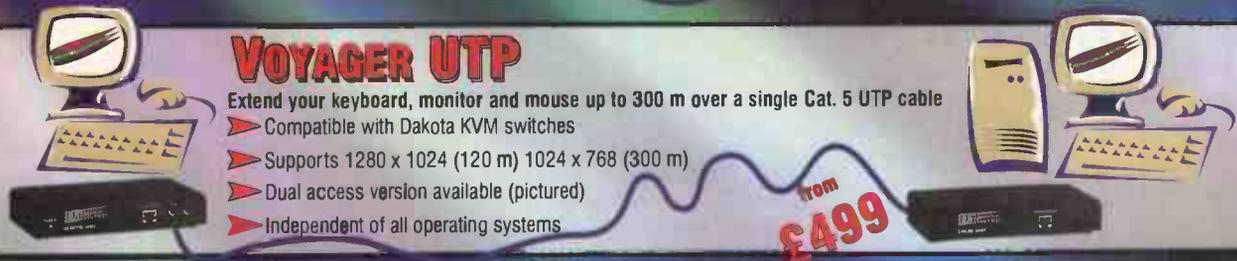
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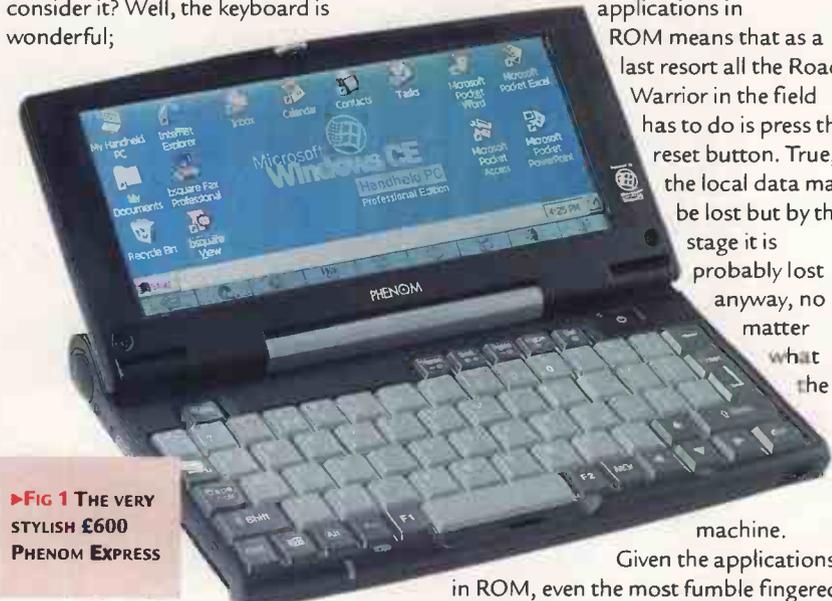


# New order

Mark Whitehorn tries the Phenom Express, one of a new generation — neither PDA nor laptop.

**W**hen I was a boy (*here we go! — Ed.*) PDA's were just that; Personal Digital Assistants. Recent arrivals are now threatening to create a whole new class of machine, neither PDA nor laptop but something in between (Lap Assistants?... could be useful for TV's Eurotrash). I'll stick my neck out and say that these machines will be sold into the PDA market but will threaten the sales of laptops more than, say, Psions.

**Consider the LG Phenom Express [Fig 1],** a Windows CE machine on which I am typing these words. At 23.5 x 15 x 2.8cm, it will fit into no-one's pocket save a poacher's. The battery life of about five hours (rechargeable Li-ION) is laughable compared to that of a Psion. And the cost, at about £600, is just gross. So why would anyone even consider it? Well, the keyboard is wonderful;



► **FIG 1** THE VERY STYLISH £600 PHENOM EXPRESS

85 percent of full size makes it a joy to use. It has a built-in fax modem (56K) and 32Mb RAM as standard. The touch-sensitive, back-lit, colour screen (19.5 x 7cm) is to die for and the whole machine is very stylish in a Star-Trekish sort of way. This machine is highly unlikely to attract the dedicated Psion user who lives to astound people by nonchalantly pulling a fully functional computer from a pocket

or handbag. A Pilot user would be even more horrified: 'Have you seen the size of that thing?' But what of the corporation that wishes to provide computing for its mobile workforce? Not only does the Phenom do most of what you can expect from a laptop, it has one outstanding trick that will instantly endear it to corporations; it is almost impossible for the user to screw it up.

The oldest conversation in corporate laptop land is: Road Warrior: 'Er... look, my laptop has suddenly stopped working.' Technician: 'OK, let's have a look...' Technician (*accusingly*): '...You've been fiddling with the setup haven't you?' This is inevitably followed by the old lie. Road Warrior (indignantly): 'Certainly not!'

**The very fact** that WinCE machines store applications in ROM means that as a last resort all the Road Warrior in the field has to do is press the reset button. True, the local data may be lost but by this stage it is probably lost anyway, no matter what the machine. Given the applications in ROM, even the most fumble fingered cannot delete them. And given the built-in modem it is possible to provide a simple set of instructions to enable the specialist applications to be downloaded from a phone socket together with any corporate data.

No-one in their right mind would suggest that this immediately makes the laptop obsolete. I use mine as a portable OLAP server, which might stretch the Phenom somewhat, but combining this

resilience with the price (risible for a PDA, breath-taking for a laptop) must make this class of machine well worth a closer look for corporate use.

► **Student's pet**  
Chalk up another for the weird coincidences attributable to our *Hands On* sections. I had already written the above before the following email arrived from Liz Jones <liz-jones@dial.pipex.com>: 'I need something portable with which I can take notes at lectures. I am interested in PDA's (e.g. the Nino) as opposed to palmtops as I cannot quite grasp how easy it would be to type on a keyboard that small and, as I am sure you can appreciate, I need to take notes fast during lectures! Nevertheless I would prefer a laptop but really the

*It is almost impossible for the user to screw it up*

most I am willing to pay is about £500.' I know the Phenom Express is over Liz's price limit but hopefully it is close enough to be worth consideration. If not, there is always the lower-spec Phenom [Fig 2] at around £350 (incl VAT).  
• *Read more about the Phenom Express in our Reviews section, starting on p76.*

► **Programming with OPL.**  
Last month I left you with:  
PROC Penguin :  
AT 5, 5  
PRINT "Hello World"  
PAUSE 15  
ENDP  
Your homework was to find out firstly whether the first number moves the words down or to the right? And secondly, what values you need to place these words in the centre of the screen? The answer is that the first figure moves the words to the right, the second moves the words down.  
The co-ordinate 1,1 would be the top left-hand corner of the screen (rather than the 0,0 you might expect as the origin of a graph). The figure which corresponds to the bottom right of the screen varies with the different Psions. The value 92,21 works for the Psion 5 but

only if you are printing a single character, since any others will try to print off the screen and generate an error.

You can, of course, work all of this out by altering the figures one at a time and running the program after each change. I feel almost embarrassed stressing the point that you should change only one thing at a time but experience suggests that people often try altering several values at a time and this leads to confusion.

It is also worth stressing that experimentation like this is considered to be a much better way of learning than reading the manual. For a start, manual reading is intrinsically boring. Secondly, most people's brains learn more from experience than from reading.

A reasonable set of values to centralise 'Hello World' on the Series 3 is 15, 5. On the Series 3a try 25, 9. On the 5 try about 37,10.

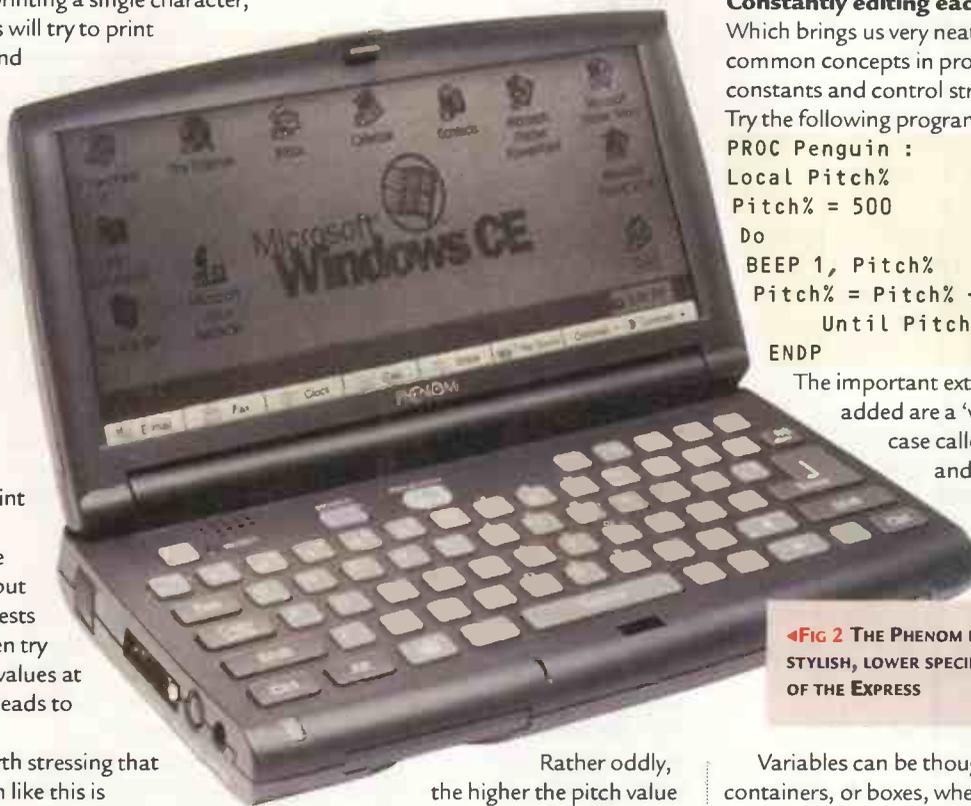
**So the words are centralised.** What's next? Well, what about a beep?

```

Add the line:
PROC Penguin :
AT 37,10
PRINT "Hello World"
PAUSE 15
BEEP 30, 200
ENDP
    
```

and run the program. If you hear nothing, go to the System screen, open up the Control Panel and check that sound is enabled. Once again, try experimenting with the values. I find quite a difference between the noises made by a Series 3 and a 3a for the same values, but '30, 200' works on all machines and is a good starting point.

By playing around with the values, you should find that the first number (or 'argument') controls the duration of the noise, the second the pitch or frequency.



**Constantly editing each line** is a pain. Which brings us very neatly to a pair of common concepts in programming; constants and control structures.

Try the following program:

```

PROC Penguin :
Local Pitch%
Pitch% = 500
Do
BEEP 1, Pitch%
Pitch% = Pitch% + 20
Until Pitch% > 600
ENDP
    
```

The important extra bits we have added are a 'variable' (in this case called Pitch%) and a control structure (the Do...Until bit).

**◀FIG 2 THE PHENOM IS THE LESS STYLISH, LOWER SPECIFICATION PARTNER OF THE EXPRESS**

Rather oddly, the higher the pitch value the deeper the noise that comes out of the Psion. I suppose that if you think of the second value as wavelength rather than pitch it makes more sense, but it still seems counter-intuitive to me.

Suppose you wanted to have several noises, one after the other. Why? Well, you may be trying this on the train and you want everyone to think that you have a Psion which also works as a mobile phone... or, more seriously, you might want to find out more about programming.

You could do this by adding lots of lines, one for each noise:

```

PROC Penguin :
AT 37,10
PRINT "Hello World"
PAUSE 1
BEEP 1,500
BEEP 1,520
BEEP 1,540
BEEP 1,560
BEEP 1,580
BEEP 1,600
BEEP 1,620
    
```

ENDP

In fact, this sounds very little like a phone but it took me about five minutes to come up with even this list.

Variables can be thought of as containers, or boxes, where the program can store numbers for later use. The program puts the value 500 into the variable called Pitch% and then, two lines later, uses Pitch% as an argument for the BEEP command. Since Pitch% contains a value (500), that value is actually passed to the BEEP command. Then, the line Pitch% = Pitch% + 20 adds 20 to the 500 in Pitch%, bringing it up to 520.

The Do...Until control structure simply allows you to control which steps of the program are carried out and how

frequently. The example above effectively says: Make the noise, increment the pitch value by 20, keep on doing this until the pitch value becomes greater than 600. So the BEEP line is carried out seven times.

Once you get your head around the way this is working, you suddenly realise that it is wonderfully easy to make major changes to the program just by altering one value. For instance, if you change the line

```
Pitch% = Pitch% + 20
```

To

```
Pitch% = Pitch% + 1
```

the BEEP will sound 81 times, each one only slightly lower in pitch than the

### What's next? Well, what about a beep?



previous. True, this makes your Psion sound even less like a phone — more like a demented Bumble Bee in fact — but hey, it's fun.

You can put almost any line of code that you like within the Do...Until loop. As an experiment try adding the line PRINT Pitch% in between Do and Until. Then try any other experiments that appeal. It is possible to generate Do...Until loops that never finish, such as

```
Pitch% = 510
Do
BEEP 1, Pitch%
Pitch% = Pitch% + 20
Until Pitch% = 600
```

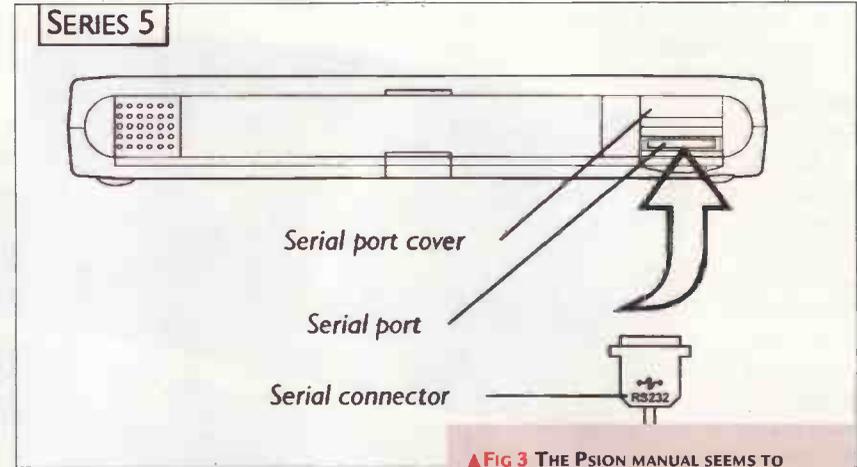
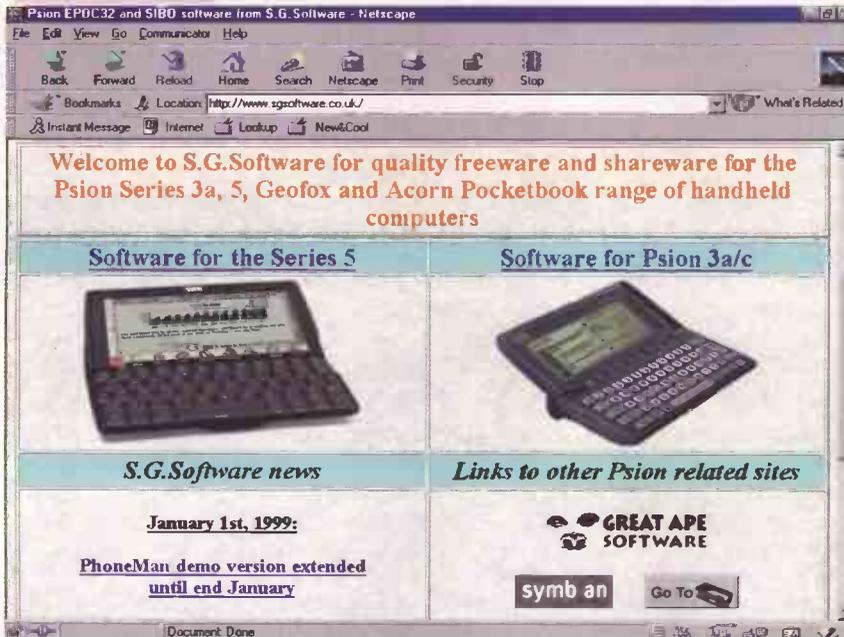
The 'Until' condition is never met because Pitch% will never be exactly equal to 600. If you find that your program doesn't seem to want to stop running (which it won't if you run this code), pressing Ctrl Esc should stop it and get you back to the code.

### Connectivity corner

Reader Sandy N <sandyn@mora.demon.co.uk> contacted me: 'The first time I tried it, the link worked reliably. My next attempt was a disaster. No matter what I did I could not get the Psion to talk to the PC so I checked the manual to make sure the connector was installed correctly — it

was [but see Fig 3]. After a great deal of head scratching I checked the

▼ Fig 4 You can obtain details of PHONEMAN FROM WWW.SGSOFTWARE.CO.UK



▲ Fig 3 THE PSION MANUAL SEEMS TO SUGGEST THAT YOU INSERT THE RS232 CONNECTOR UPSIDE DOWN... TAKE CARE!

connector again and found that according to the connector polarisation, it was in *upside down*. I turned the connector around and, hey presto! — away it went. My understanding of the PsiWin manual diagram is that the connector goes into the Psion with the RS232 marking uppermost — it is very easy to insert the connector the wrong way round and there is little difference in the force required to insert it incorrectly.'

I agree with Sandy, the diagram does suggest that the 'RS232' marking should be uppermost and it will not work in this position. He goes on to (kindly) suggest that the manual might be correct and that he simply has one of a batch of faulty cables with incorrect marking. But both of the cables I have are like his, so I guess the manual is wrong. In fairness though, the manual also suggests in

writing that you check the orientation before insertion. To make matters worse, the socket in the Psion 3c and 3mx is the other way up, meaning that the RS232 marker on the cable should be uppermost!

The bottom line is: check how your cable should be connected and then mark it yourself, perhaps with a blob of white paint.

I have received reams of email about connectivity and the Psion and a host of helpful replies about the issues raised in the previous couple of columns. The best of these are detailed and hence too long to include here so they are on our PCW CD-ROM as a text file called PDAPR992.TXT. Thanks to readers Neil Mellerick, Louis Berk, Adam Stevens, Kevin Snelling, Darren Griffin, Steve Williams and George Cooke for their contributions.

For instance, several readers have recommended SG Software's PhoneMan [Fig 4] for the Psion Series 5 which should help 'gorgeous@globalnet' Steve's aspiration to use a Psion 5 with an Ericsson SH888 (PCW, Feb). PhoneMan lets you download and manage your phone's address book. A time-limited version is available from [www.sgsoftware.co.uk](http://www.sgsoftware.co.uk) or the full version costs about £18. Further details are in our CD's text file.

### PCW CONTACTS

Mark Whitehorn welcomes your feedback on the PDA's column. He can be contacted via the PCW editorial office (address, page 14) or email [pda@pcw.co.uk](mailto:pda@pcw.co.uk)

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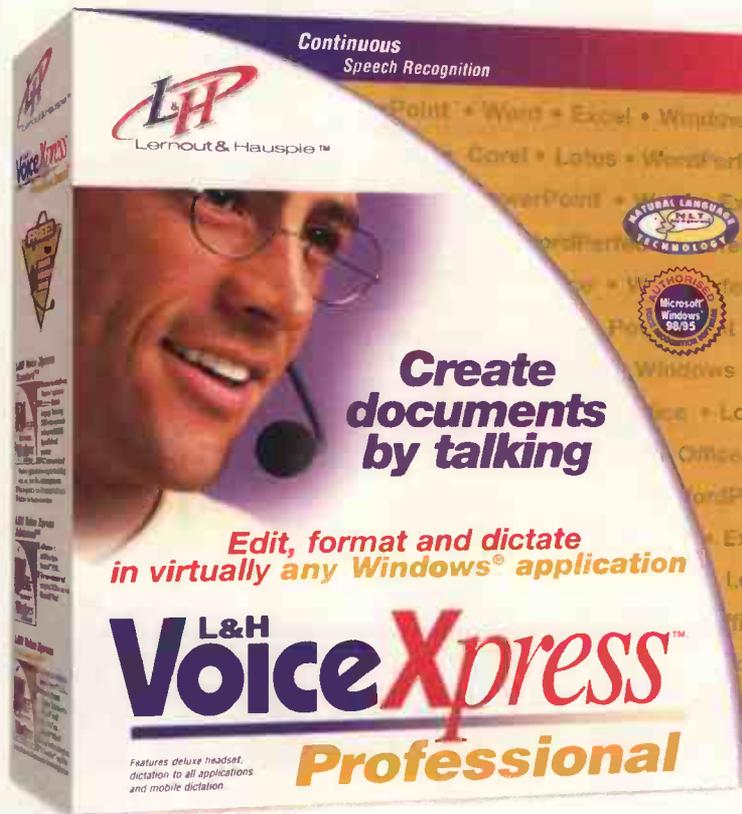
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# Bumper bundle

The Office Suite 99 package has a **good range of apps** for Linux users. Chris Bidmead tries it out.

I mentioned last month that I was planning a lunch with Sir Clive Sinclair to put him in the picture about Linux. When Martin Huston (see the panel on p246) heard about this meeting he sent me a spare copy of Office Suite 99 for Linux to take over to Sir Clive to get him started. I've duly delivered the package but do not, as yet, have anything to report about Sir Clive's reaction to it. Here, however, is mine.

Like Star Office, the Office Suite 99 bundle is a great way to get started with Linux if you're one of those people who feels lost without a word processor, spreadsheet, graphics editor, presentation package and the like. The single disc version of SuSE 5.3 — the standard distribution is a five-CD set — is stripped of refinements like the 'live system' CD and comes without full source code, although under the terms of the Linux licence this is still obtainable from [www.suse.com](http://www.suse.com). But it includes all the easy-install features which have deservedly turned the German company into a world-class Linux distributor.

Included, too, is the excellent SuSE Linux manual, a chunky paperback of over 400 pages which steers you through the operating system installation, configuration and first steps in a sometimes quaint but seldom obscure translation from the original German.

**The office suite installation** of ApplixWare, installs as a set of RPMs. These are files created in accordance with the specification of the Red Hat Package Manager which, despite its proprietary sounding name, has become a standard method of Linux software distribution <[www.rpm.org](http://www.rpm.org)>.

Automatic installation scripts inside the ApplixWare RPMs check on available system libraries, ensuring that the software installs equally on libc5 (e.g. SuSE) or libc6 (e.g. Red Hat) systems.

*The Office Suite 99 bundle is a great way to get started with Linux*



▲ FIG 1 APPLIXWARE DOESN'T ATTEMPT TO BE A FEATURE-FOR-FEATURE MATCH FOR MICROSOFT OFFICE AND HAS MANY ADVANTAGES OF ITS OWN. BUT IT DOES PROVIDE A FAMILIAR-ENOUGH INTERFACE FOR WINDOWS USERS TO FEEL AT HOME

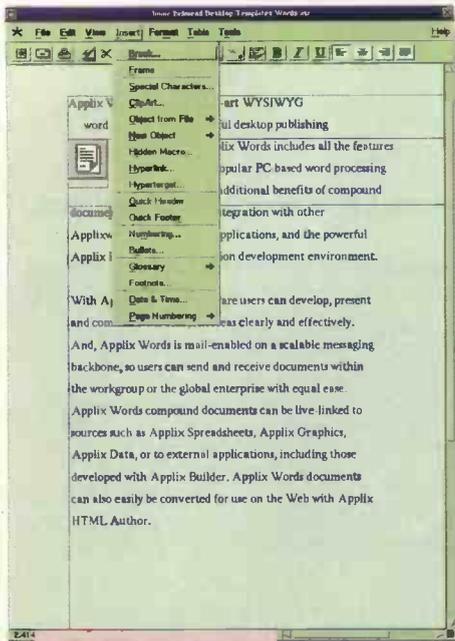
This makes Office 99 rather easier to install than either Star Office or WordPerfect, both of which come as tarballs, which may need a certain amount of manual jiggling.

Although I've been a professional writer for over 30 years and have used computers for that purpose for over half that time, I'm probably the world's worst judge of what makes a good word processor. Word processors seem to be mostly about fancy typesetting and page layout which are things I leave to the magazine and book people who print my stuff. What I'm interested in is getting text down on screen as fast as I can think, and editing it as fast as I can rethink. I need to be able to shift around through a

chunk of long prose, or from sentence to sentence, or paragraph to paragraph really quickly, preferably without having to reach for a mouse. Word processors, with their clutter of icons and their preoccupation with showing you how it's going to look in print — I hardly ever print anything — don't work like that. Give me EMACS every time.

I'm using Applix Word to write this [Fig 2] however, and for a word processor it really isn't too offensive. You can strip it down to a plain window with a status line at the bottom and a menu at the top, or you can run it with the full panoply of icons, supplemented with your own macros (thanks to the debugging macro editor). It seems to do most of the things I remember Microsoft Word being able to do and it can read and write Microsoft Word documents (it says here on the box).

There's an HTML mode for reading and writing web pages, and converting them to and from Applix Word format. Unlike Microsoft Word, and Star Office for Linux for that matter, Applix Word is



**▲ FIG 2 APPLIXWORD'S VERSATILE DOCUMENT LAYOUT AND MANIPULATION FUNCTIONS**

X compliant, so you can use it on one

machine on the network while actually running it on quite a different machine.

An old-fashioned feature of Applitext Word is that it separates file opening and file saving from importing and exporting. Saving or opening a file in anything other than the 'native format' ought to be a transparent operation. Ideally there should be no 'native format' and you should be able to set the default to open or save in anything the word processor can handle. But I shouldn't carp, the luxury of being able to read and write Microsoft Word files is not a feature of EMACS. And, I understand that many of you out there really need to do this, even though I happily manage to avoid this necessity most of the time.

Earlier versions of the Applitext spreadsheet lacked the 'tabbed book' format which is a standard feature of Windows spreadsheets. That is now fixed in Applitext 4, in this respect bringing it up to par with Star Office. The spreadsheet will import and export Microsoft Excel and Lotus 1-2-3 sheets, in addition to

**▶ FIG 3 AS WELL AS STANDARD PRESENTATIONS, APPLIX GRAPHICS IS ADEPT AT HANDLING LARGE, COMPLEX DRAWINGS. THIS ONE, OF A PRINTED CIRCUIT BOARD, USING FULL COLOUR GRAPHICS COMES AS PART OF THE APPLIXWARE TUTORIAL MATERIAL**

## CATCHING UP

In reply to the item 'Is it Linux or is it Windows in the February column, Tom Wright <tom@gemnet.demon.co.uk> thinks a column on KDE/Gnome would be 'a very good idea'. As far as Tom is concerned, the desktop is 'the basis upon which Linux will get accepted as a desktop operating system, or not.'

Er... I had to scratch my head about this one. Yes, I know there has been a lot of chat recently about precisely this question, but what I replied to Tom was: 'Frankly I'm not at all bothered about Linux

'getting accepted'. Plenty of us accepted it ages ago.' On reflection, though, this reply was a bit brusque. Sorry, Tom. What I was trying to say was that as far as I am concerned Linux is Linux, and it's evolving in its own way. If people really think that Windows 95/98 is a better desktop operating system, then let them use that. What I don't want to see is Linux straining for some kind of Windows 'look and feel' just so it can 'get accepted'.

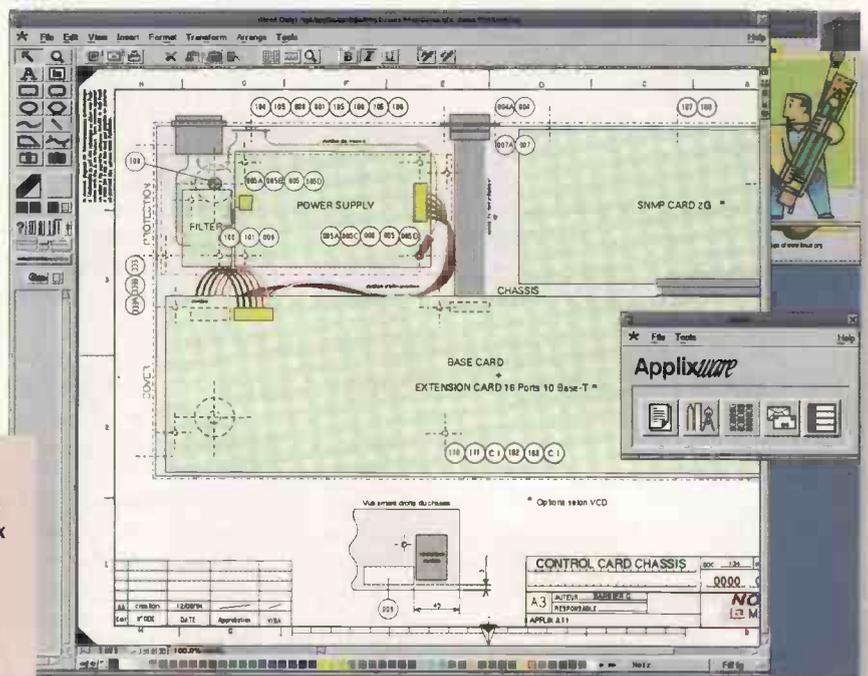
**SuSE Linux Office 99** Last month, I broke the bad news from Martin

Huston that he's pulling out of selling the SuSE Linux distribution by mail order from his web page at [www.deluxe-tech.co.uk](http://www.deluxe-tech.co.uk). Martin is still meeting bulk orders but tells me he can no longer spare the time to deal with single quantities. He has however, been shifting his stock of Linux Office Suite 99, which bundles Applitext version 4.41 (and some other useful applications like the Adabas relational database) with a no-frills edition of SuSE 5.3 in a two-CD set for around £60 (incl VAT).

the usual DIF, SYLK, CSV and plain ASCII formats.

It can't handle dBase files, which is where Star Office has the advantage, but a big plus is the Applitext Data application, a database access tool

which allows you to query SQL databases and update database information. There are links for various SQL database flavours — Oracle, Sybase, Ingres and Informix — as well as a generic ODBC interface that you could use for



# Linux Networks

linking into dBase, for instance. It is ODBC that you use to connect to the Personal Edition of Adabas D which comes bundled with the SuSE Linux Office Suite but this is not something I had time to explore.

I did let myself get caught up in Applix Presents, the kind of presentation package with which corporate executives

**If you're going to invest in an office suite, ApplixWare seems a good bet.**

spend far too much time messing about. It seems to offer all the usual slide creation and transition features you'd expect, and can even import and export Microsoft PowerPoint 97 files.

**ApplixWare** has a built-in email handler, which you may or may not regard as a plus. Linux users already have a wide choice of email clients, and as a proprietary addition to the repertoire Applix Mail doesn't seem to offer much over, say, the excellent free open source xmail written by Gennady B. Sorokopud — see [Burka.NetVision.net.il/xmail](http://Burka.NetVision.net.il/xmail). But the key to an Office Suite, I suppose, is the integration of the various elements.

The Linux Office Suite 99 comes with a module called Builder, a rapid application development environment for creating customised object-oriented applications using the various Applix functions. Builder isn't documented in the Applix manual supplied with the office suite but two of the several Applix online books supplied with the CD-ROM are dedicated to Builder, so there's no shortage of information on the subject.

Personally I'm as enthusiastic about 'Office Suites' in general as I am about word processors. But if you're going to invest in one, financially and time-wise, ApplixWare seems a good bet. It runs across a whole range of different hardware and software platforms and there's even a version written in Java.

**Here's an endorsement** for ApplixWare from reader Neil Homer, at [neil.h@dial.pipex.com](mailto:neil.h@dial.pipex.com), which I printed in this column last year. Neil installed Red Hat 5.0 and added what was then the current version of ApplixWare. He came to the conclusion that 'if you can do it using Windows then you can do it using

## THE AUTOPILOT COMMAND

A helpful introduction to operating system basics for beginners is 'Unix is a Four Letter Word' put together by Chris Taylor <[taylor@linuxbox.com](mailto:taylor@linuxbox.com)>. You need to keep your wits about you, though. For instance, here's a sample from the manual pages that I thought might be appropriate this month.

The ap (auto pilot) command has a deceptive name. It doesn't actually place the computer on autopilot. The ap command reads your mind and attempts to perform the commands you want done. For example, thinking "I really wish I had a backup copy of the tanana image" will cause ap to input `cp tanana.* tanana_bak.*` to the Unix shell. Preceding a thought with "ignore" will cause ap to ignore your next thought. Although, with enough practice, the ap command can be a significant time saver, there are a few unresolved problems with this command.

1. I often change my

mind while in the thinking process. In the previous example I may have decided later that I wanted to call the backup copy something else. No big deal here, ap just changes the filename but it isn't the most efficient use of computer resources.

2. All of the commands are echoed to the screen so that you know exactly what is going on. This is great as long as you remember to think "ignore" before you read each command. If you forget, the command will be executed again. This will continue until you remember to include the "ignore" flag or you think, "What is going on here?" which will cause the man pages for the particular command you are repeating to be displayed.
3. The ap command reads the strongest mind waves (known as grey waves) that it finds. If you have weak grey waves or your monitor is closer to someone else in your office, ap may listen to someone else's mind instead of yours. Also, walls do not

provide insulation from grey waves, so if your monitor is near a wall, be prepared for some grey waves from minds on the other side of the wall to occasionally sneak in.

4. As you probably know, humans (you included) don't use their brains to their highest potential. In fact, many believe that we use as little as five percent of our brain's capacity. The problem here is that ap is only able to read around 80 percent of your mind. Unfortunately, many people use the five percent of their mind that ap can't read. When ap is called it scans your mind for activity, if none is found it prints the following cryptic error message: `ap: Command not found.` This indicates that it couldn't find a command in your head. Don't worry, this doesn't mean that you aren't thinking, it just means that you use the part of your brain that ap can't access.

\* The above extract is from 'UNIX is a Four Letter Word' at [www.linuxbox.com/~taylor/](http://www.linuxbox.com/~taylor/).

Linux. I can't believe that I can do whatever I want with Linux and ApplixWare for about £140 that would cost me three or four times as much to do with Windows 95 and Office, never mind the rest of the server products that come with Linux.'

Oh, and Neil isn't just some myopic UNIX geek (like me). His job is administering Windows NT networks so he knows what he's talking about. You'll have noticed that the price he quotes is well out of date now. Today you can get

the ApplixWare/Linux bundle for less than half that. See [definite.ukpost.com/applixware.html](http://definite.ukpost.com/applixware.html) for the UK price and full product details. The international ApplixWare for Linux site is at [linux.applixware.com](http://linux.applixware.com).

### PCW CONTACTS

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# Star quality

The latest version of Star Office suite looks good — Terence Green downloads the free version.

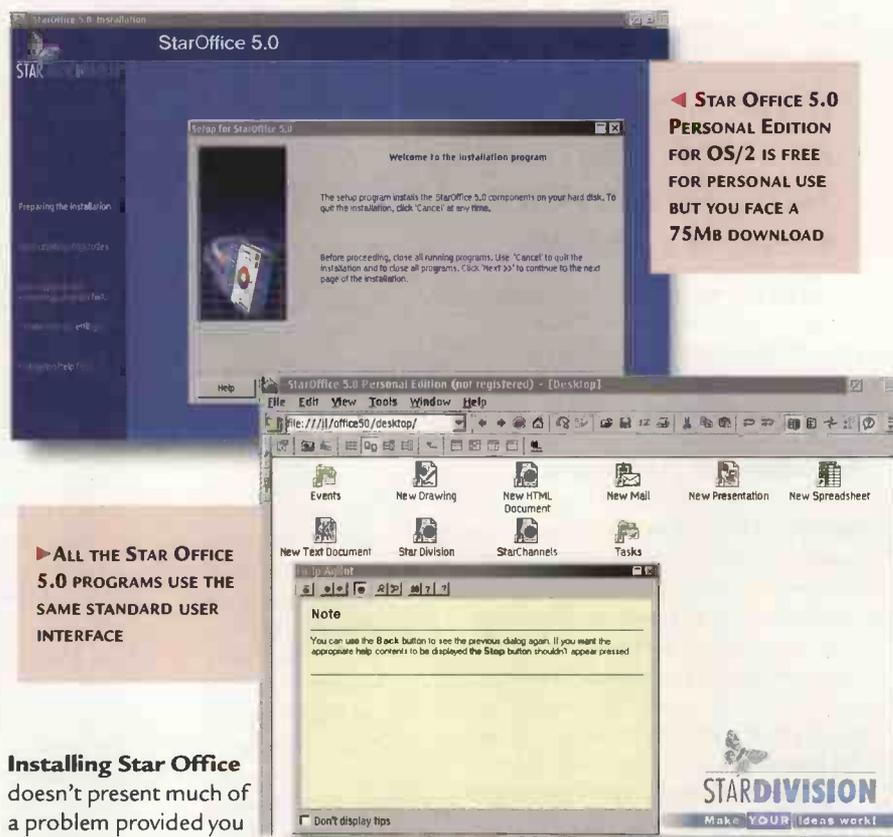
Ironic, isn't it? We waited something like four years for Lotus SmartSuite for OS/2 Warp 4 to appear and, within months of its release, Star Division launches an OS/2 office suite which is free for personal, non-commercial use! Star Office has been around for several years but has been refined into its present, rather sophisticated, state in version 5.0. I briefly looked at version 3 a couple of years ago and found it to be a bit clumsy, but reader Jean-Yves Rouffiac pointed me at version 5.0 and suggested that I place it on our cover CD, so I had another look.

**The free version,** Star Office 5.0 Personal Edition is available as a web download and it's 75Mb! It comprises a word processor, spreadsheet, graphics and presentation module, news and mail readers, an HTML editor and a few utilities. All the components feature a standard user interface. I've had a look at the suite and it would certainly be worth placing on our cover CD. But there's a catch. The download requires a registration procedure which involves an individual key derived from your email address without which the program cannot be installed. And, once installed, the program will only work for 30 days without being registered. This is free but the combination of the download procedure and the licence for the free edition means that it is not possible to put this product on our cover-mounted CD.

I've contacted Star Division to see if something can be worked out but in the meantime any readers who have a reliable and fast connection to the net might wish to have a look for themselves.

One of the download sites is the Sunsite at Imperial College in the UK. With a fast modem, say 56K, the file should take under eight hours to download. At weekend rates for a local call that would cost under £5 provided you get it all on the first attempt.

*Star Office has been refined into its present, rather sophisticated state*



◀ **STAR OFFICE 5.0 PERSONAL EDITION FOR OS/2 IS FREE FOR PERSONAL USE BUT YOU FACE A 75MB DOWNLOAD**

▶ **ALL THE STAR OFFICE 5.0 PROGRAMS USE THE SAME STANDARD USER INTERFACE**

**Installing Star Office** doesn't present much of a problem provided you can spare the space. The standard installation needs 130Mb of free space and the minimum install

wants 60Mb. A copy of Java 1.1.6 is included in the distribution. If you have already installed Java 1.1.6, Star Office will automatically

configure itself to use that copy. If not, you can install the copy provided by Star Office after installing the main office suite and you don't have to have Java unless you want to use it in Star Office.

If you like the look of Star Office 5.0 you can upgrade to the full version for \$40 which includes a distribution CD and initial setup support. Printed documentation costs extra.

Documentation for the free download version is limited to an Adobe Acrobat file which you can find on the web, from the Star Division site, or you can get a hard copy via a mailing list.

A commercial single-user licence costs \$170 and from there you get into business pricing which also allows you to run it from a network file server. Star Office 5.0 (including the free Personal Edition) is available for OS/2, Windows, Linux, Solaris and the Macintosh and there is a pure Java commercial version.

• Talking of Lotus SmartSuite for OS/2, a maintenance Release 1.1 was available at the end of December. The main new features are Microsoft Word 97 and Excel 97 Import filters, additional Y2K support and Euro Support. More details from [www.lotus.com/smartsuiteos2](http://www.lotus.com/smartsuiteos2).

▶ **Aurora.** The web server in the next version of Warp Server, codenamed Aurora but officially to be known as 'OS/2 Warp Server for e-business', looks likely to be based on IBM's OS/2 port of the Apache web server. Aurora is set to ship in April and will include IBM's WebSphere Application Server. WebSphere is IBM's multi-platform web

## TOP TIPS FOR OS/2

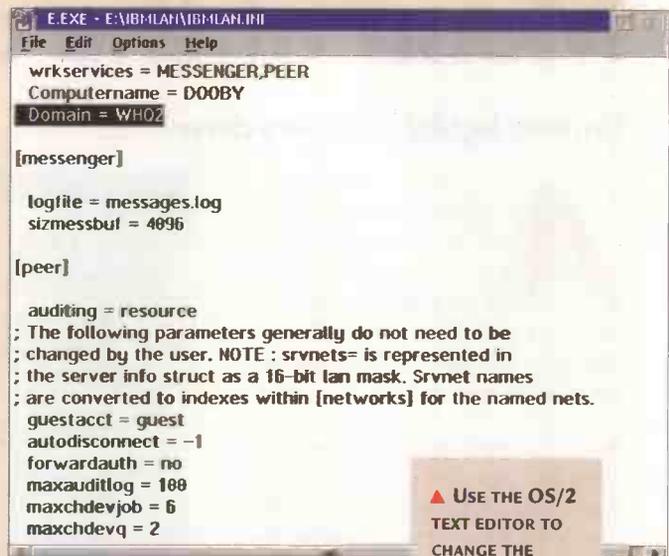
Reader Rupert Russell asked how to change the domain or workgroup name in OS/2 because he's replacing an old OS/2 server which will now be used in a different workgroup – it's easy to do with any text editor like Warp's E.EXE editor.

- Open the IBMLAN.INI file which is in the x:\IBMLAN subdirectory (where 'x' is the OS/2 boot drive) and look for the line 'DOMAIN ='. It is under the [requester] subhead but some way down the list just before the [messenger] subhead.
- Edit it to read 'DOMAIN = abcde' where 'abcde' is the name of the workgroup or domain.

If there are several workgroups or domains on your network and you would like the OS/2 network client to be able to see them as well, you can achieve this by editing another of the [requester] lines. Look for the 'othdomain' keyword which is near the top of the list and simply add the domains or workgroups separated by commas, as in 'othdomain = workgroup2, domain2, domain3' (see screenshot, right).

➔ **I'm no nearer** to discovering how to use REXX but you can learn more from 'REXX Tips & Tricks', and from an OS/2 INF file which can be found at [hobbess.nmsu.edu/pub/os2/dev/rexx/](http://hobbess.nmsu.edu/pub/os2/dev/rexx/) on the Hobbes OS/2 Archive. The file includes everything you need to get started with REXX.

➔ **If you have a laptop** computer or a desktop with PCMCIA card slots and you can't get it to see your PC cards as anything other than a memory card, try adding the following line to the beginning of the CONFIG.SYS file:  
 BASEDEV= RESERVE.SYS /mem:CA00,2000  
 This resolves a problem where the PCMCIA driver loads over a ROM address and prevents the card's ID from being read. What the command does is to reserve memory for the card.



▲ **USE THE OS/2 TEXT EDITOR TO CHANGE THE WORKGROUP OR DOMAIN NAME OF AN OS/2 CLIENT PC**

If you are still having problems with PCMCIA cards, have a look at Dr. Martinus' OS/2 Notebook site at

[www.os2ss.com/users/drmartinus/Notebook.htm](http://www.os2ss.com/users/drmartinus/Notebook.htm). In fact, if you're planning to buy a notebook for OS/2, you should make a point of consulting the good doctor. He has a long list of notebooks categorised by their suitability for running Warp.

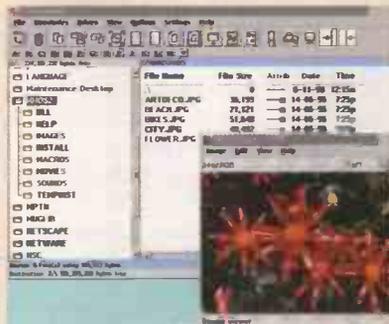
➔ **The IBM Technical Documents** database is another good resource if you're stuck on a Warp technical problem. You can search the database for new documents, or search by product at [service5.boulder.ibm.com/pspsdocs.nsf/](http://service5.boulder.ibm.com/pspsdocs.nsf/).

➔ **Have a look** at the Jim Lewis OS/2 Web Page at [chauvet.com/jim.lewis/](http://chauvet.com/jim.lewis/) for some nifty, free OS/2 programs including a CONFIG.SYS checker, some Java games and several file utilities.

## FILE FREEDOM 2.01

I am always on the look-out for OS/2 Warp file managers. My latest find is File Freedom 2.01 – a trifling 120Kb download. And, it's free. It's a feature-rich graphical file manager which is not too difficult to get to grips with. It supports file viewing, drag-and-drop file management and viewing, including those in zip files. It is really easy to install and you can add as many additional

viewing programs as you need. File Freedom 2.01 is the work of Bruce Henry and you can find it at Hobbes in [hobbess.nmsu.edu/pub/os2/util/browser/filef201.zip](http://hobbess.nmsu.edu/pub/os2/util/browser/filef201.zip) or on his personal web site at [www.kv.igs.net/~brhenry](http://www.kv.igs.net/~brhenry).



▲ **FILE FREEDOM 2.01 IS A FREE BUT FEATURE-RICH FILE MANAGEMENT TOOL FOR OS/2**

application and development server package. It's pure Java and supports Java Server Pages and Enterprise Java Beans. It runs on most Intel and UNIX platforms including Windows NT, Solaris, AIX, the AS/400 and IBM mainframes using Microsoft, Netscape, Apache and IBM web servers.

IBM says Aurora is its entry-level e-business server. This is slightly misleading though, as Aurora will fit snugly into any network environment, especially Windows and UNIX networks as it supports the UNIX Network File System and IBM/Microsoft SMB networking on which Windows networks are based.

### PCW CONTACTS

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# Menu of the day

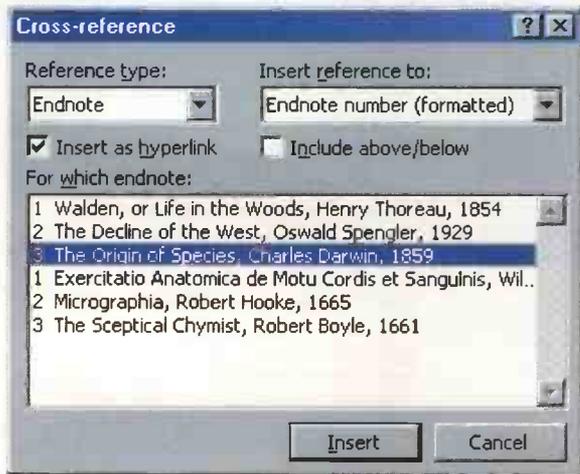
Tim Nott highlights the very clever **Adaptive Menu system** in the latest Office 2000 beta.

**A**t the time of writing, phase two of the MS Office 2000 beta preview was well under way, with 700,000 users expected to take part. The final release of Office 2000 is due, as one Y2K bug-aware wag put it, 'some time in 1900'.

So far, I've only had a trickle of mail from fellow beta-users but there is one query that looks set to become an FAQ. A new, smart feature of the Office 2000 suite is the Adaptive Menu system. Click on a menu and you'll see around half the usual entries. Click on the double arrowhead at the foot of the menu (or simply wait a little while) and the menu expands to show the full set of commands.

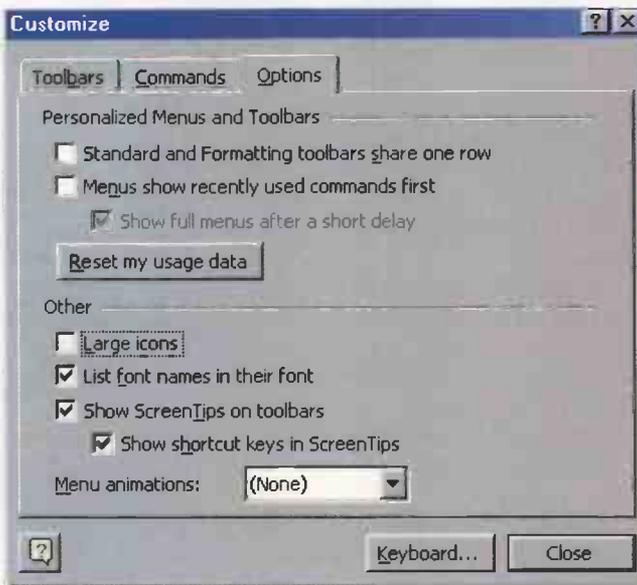
It's actually more clever than that, in that it remembers any commands you pick from the full set and promotes them to the short list. Similarly, commands on the short list which don't get used will in time be demoted so you end up with a streamlined menu system tailored to your personal needs.

Some users, it seems, are churlish enough *not* to regard this as A Good Thing and have asked: 'How on earth do I turn this off and get normal menus back?' There appears to be nothing in Tools, Options — it's in Tools, Customize (or right-click on any toolbar or the menu bar, then choose Customize). There you will see an Options tab [Fig 1] which is where you can turn off 'Menus show recently-used commands first.'



endnote referencing. The Vancouver style is where superscripted numbers refer to references at the end of the section. This is mainly used in medical and scientific papers,

**◀FIG 2 CREATING ADDITIONAL POINTERS TO EXISTING REFERENCES — BUT MAKE SURE YOU HAVE THE RIGHT CHAPTER**



**◀FIG 1 RESTORING THE STANDARD MENUS IN WORD 2000 BETA**

While we're in this dialog, I must admit that I do like one of the other options there. Listing font names in their own fonts, thereby giving an instant short sample, is something that has long been on my wish list.

### ◀ A footnote to endnotes

Last December's excursion into footnotes and endnotes generated considerable interest. I didn't realise that there were so many well-informed and academic users out there.

Oliver Blatchford, who has upgraded from a Master's degree in Word 2 to a Doctorate in Word 97, wrote to tell me that there are two main formats of

Although the latter method cannot really be automated in Word, it does solve one shortcoming of the way the Vancouver style is implemented. If, as is likely, you refer to the same publication more than once in a chapter, then the list of references is going to contain duplicate entries. You can't, it seems, repeat a superscripted number to point at the same reference in the same chapter... or so I thought. Oliver pointed out the very useful cross-reference command [Fig 2] which can do just that:

- If you choose 'Endnote' for the Reference Type, you'll see a list of endnotes below.
- From the Insert Reference To list, choose 'Endnote number (formatted)'. If you only have 'Endnote Number' listed here you will have to manually superscript the number.

A point to note is that this is not foolproof if you are grouping all your endnotes in one place but restarting the numbering by chapter.

**You need to make sure** that you are cross-referencing an endnote in the same chapter because Word won't stop you straying across other chapters' references. What you are getting here is a cross-reference field, so you may need to update the fields manually from time to time by pressing F9.

## Questions & answers

**Q** I have tried everything I can think of to display the date as '10 December, 1998' rather than '10/12/98' when I click on the date button on my toolbar in Word 95. Instead, I have to go to the insert menu and do it from there. I've ploughed through my manuals but I cannot see how to do this simple thing.

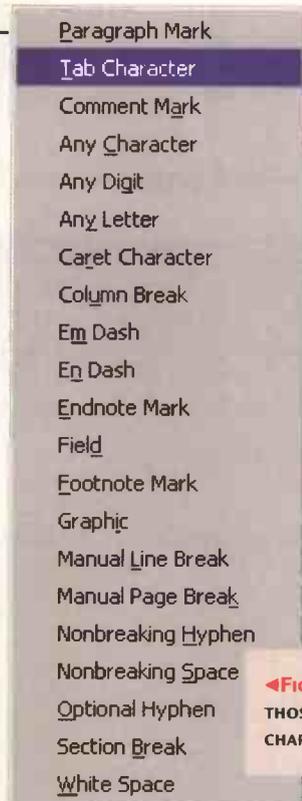
GORDON BAIN

**a** I don't have such a button on my toolbar and it sounds as if this might be running a macro to insert the date. The best thing would be to remove the button using Tools, Customize, then record a new macro. Call this macro 'Longdate', say, and assign it to a new button. With the recorder running, insert the date from the menu in the preferred style, then stop recording. If you want to do it the programmer's way, then the WordBasic code is as shown in Fig 5.

**Q** Is there a list of Alt codes for tab, carriage return etc., for Word's Search and Replace? I can't find it on the MS web site.

ALASTAIR LACK

**a** I'm sure it's somewhere in the Help file but you don't need to go that far. Click the More button on the Find/Replace dialog, then the Special button and you'll see a

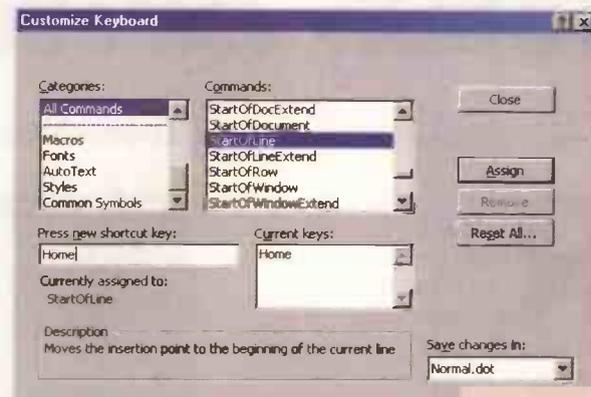


list of special characters [Fig 3]. They don't actually use Alt codes, they use the caret character followed by another letter or symbol (e.g. ^p for a paragraph mark, ^t for a tab).

**Q** My Home key has stopped working in MS Word. It's fine in other applications, such as WordPerfect or composing email messages, where it takes me to the beginning of the line. I'm sure it used to work in Word, too.

JOHN DREW

**a** It seems as if the key has been reassigned. Try Tools, Customize and press the Keyboard button. With 'All Commands' selected in



Category [Fig 4] scroll through the Commands to 'StartOfLine'. Click in the 'Press new shortcut key' field, then press the Home key and see what it is currently assigned to. Click the Assign button to restore it to its proper command.

**FIG 3 FIND THOSE SPECIAL CHARACTERS**

**Q** I'm about to upgrade from a PC running Windows 3.1 to one running 98. I use WordPerfect 6.1 and am reluctant to change to MS products. Will I still be able to run my current version of WordPerfect?

BRIAN DERRY

**a** Yes, but more recent versions of WordPerfect are available. The latest, version 8, can often be bought cheaper than Word, so you could enjoy the latest 32-bit software on your new PC while retaining brand loyalty.

**Q** I need to create documents in Lotus Word Pro which can be read by other Word Pro and Microsoft Word users. If possible I'd prefer not to

have two sets of files. Is there a converter that Word can use to read WordPro files?

ANDREA MACINTOSH

**a** Not as standard. I've been told that such a beast exists but I've never laid hands on one. Your best bet would be to save in RTF format. This should preserve most formatting and can be read by practically any word processor or DTP application.

**Q** Is there an equivalent to WordPerfect's 'Reveal Codes' command in Word 97? I sometimes have strange problems with formatting and miss this valuable diagnostic.

ROBBIE GRAHAME

**a** No. You can view field codes instead of their results using Alt+F9 but these don't generally affect the format of surrounding text. A useful tip is that pressing Control + Spacebar in Word will reset all selected text to the format defined in its paragraph style. This will get rid of any piecemeal character formatting.

**FIG 4 BRINGING THE HOME KEY BACK HOME**

### [FIG 5] Dating — the programmer's way

```
InsertDateTime .DateTimePic="d MMMM, yyyy"
For those using Word 97 the VBA equivalent is
Selection.InsertDateTime DateTimeFormat:="d MMMM yyyy"
```

Reader Malcolm Martland found yet another problem with endnotes. They appear at the end of the document, irrespective of the options settings. He

discovered the culprit under File, Page Setup, Layout. There is a checkbox to 'Suppress endnotes' which, it seems, carries them all over to the final section.

### PCW CONTACTS

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## Totally excellent

Name, rank and serial number — Stephen Wells solves a problem using the Summary sheet.

**R**eader Vic Knight posed the following problem: 'On an Excel worksheet, in column B, is a list of model numbers. In column C is the number of those items needed. A model number may be repeated several times in column A. On another worksheet I want a list of the models and the total number of each, in the next column — all this to be automatically produced from the first sheet.' Vic sent a shortened version of the file, which actually had seven identical worksheets laid out on it, much as shown in Fig 1.

**Creating a Summary sheet** in Excel is easy using the macro provided under Tools, Wizard, Conditional Sum. If it isn't there, look under Add-ins, and add it. If it's not there either, load it from your original Excel CD-ROM.

Actually, all the Wizard does is guide you to write a formula such as `=SUM(IF(Sheet1!$B$6:$B$27=$B5, Sheet1!$C$6:$C$27,0))`. You can just enter it yourself.

Regarding cell C5 on this Summary sheet [Fig 2] what it means is, if any of the model numbers in the range B6:B27

Model Number	Quantity
MX717TC	3
MX778TC	3
MX707	2
GMX929TCBR	1
MX707A	1
GMX987TC	2
MX910ATC	1
GMX920TC	2
MX812TCG	1
MX917TC	1
MX926TLBL	1
MX416ATC	1
2550NTX/A	1

**FIG 1**  
A READER'S WORKBOOK HAS SEVEN SIMILAR FORMS ON WHICH PARTS AND THEIR QUANTITIES ARE LISTED

You can have as many model numbers as you like listed once on the Summary sheet in column B, and in any order. Users can enter model numbers in the forms on Sheet

on Sheet1 match the model number in the adjacent cell B5, then total the adjacent quantities from the range C6:C27 on Sheet 1.

numbers 1 through to 7 in any order they like and as many times as they want, as long as they are within the range B6 to B27 in this instance. You can always extend the range if you want to.

**It is an array formula**, which means to enter it you press Ctrl+Shift+Enter. Excel will add curly brackets to show that it understands what you want. Arrays run down a column and look at each entry to see how it compares with the specified value. They also save a lot of memory.

Once you have entered the formula in the first cell, you can drag it down the column. \$B5 will automatically change to \$B6, and so on. And, you can copy the same formula across the rows just by changing the sheet name from Sheet1 to Sheet2, and so on.

**FIG 2**  
USING THE EXCEL CONDITIONAL SUM WIZARD, IT'S EASY TO BUILD A SUMMARY SHEET TOTALLING THE QUANTITIES OF PARTS LISTED ON THE SEVEN FORMS

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Total
2550NTX/A	1	1	1	1	1	9		14
255NTX/A		2		2				4
2850NTX/A		3	3	3	3		3	15
2863NTX		1	9	2			5	17
2866NTX		1	1	3	1		1	7
2867NTX		2	2	4	2		2	12
GMX717		1	7	5	1		4	18
GMX920TC	2	2	2	8		2	2	18
GMX929TCBR	1							1
GMX935TCGR			2	3	4			9
GMX977			2	1	2			5
GMX985TCGR			1	6	8			15
GMX987TC	2							2
MX416ATC	1	1	1	1	1	1		6
MX707								2
MX707A	1							1
MX717TC		3						3

**Easter mystery**  
You can always display the day of the week on which Christmas Day will fall. Just

## Questions

## & answers

**Q** How can I quickly filter an Excel list and find all the orders received from three different firms?

**a** Press **Ctrl+End** to get to the end of your list. Paste the appropriate field name in any cell which is outside your list, and at least one blank row away from it. In



**▲ FIG 3 YOU CAN FIND SPECIFIC ORDERS IN AN EXCEL LIST USING THE ADVANCED FILTER DIALOG BOX**

the cell beneath, paste the first company name. Under that, paste the second company name, then the third. So, in cell A200 you might have Company; in A201, The Smith Co.; in A202, Brown Ltd; in A203, White Motors. Now click a cell within your list and choose **Data, Filter, and Advanced Filter**. Excel will show as a default your list

range [Fig 3]. Under that, click the arrow to the right of the **Criteria Range** box. Then highlight cells A200:A203. Click the arrow again and then **OK**. Your list will be temporarily reduced to display only those orders received from those three companies. To return to the full list, simply choose **Data, Filter, Show All**.

**Q** What's all this I hear about problems with the Excel CALL function?

**a** Don't worry about it. Microsoft has continually recommended that most people should not use this

function on a worksheet or in a macro, anyway. It is solely for the use of very experienced users. What the function does is call a procedure from a dynamic link library (DLL) or code resource. The current hoo-ha is based around the suggestion that the function might call a DLL external to the worksheet and therefore be used for malicious purposes. But if you never use the function, you will not have a problem. If you do, and you are running Excel 97 with SR-2 (Service Release 2), you can

download a patch (xl8p4pkg.exe) from the [officeupdate.microsoft.com/](http://officeupdate.microsoft.com/) web site. You can also download Service Release 2 from this site. As the patch only disables the function in worksheets, and not in macros, your best bet is simply not to use the function.

**Q** How can I generate a random real number between 50 and 100 using Excel?

**a** The formula which is generally used is  $RAND() * (b-a) + a$ . If you don't want any decimals, and using your parameters, the formula would be  $=INT(RAND() * (100-50) + 50)$ .

**Q** Why can't I persuade Excel 95 to accept more than 15 significant figures in long numbers?

Regardless of the number of digits displayed, Excel stores numbers with up to 15 digits of precision. If a number contains more than 15 significant digits the extra digits are converted to zeros.

**Q** I have created a form in Excel 97. Only part of the form can fit on the screen and I can only print

part of it. Could you advise me how to display and print the entire form?

**a** In order to view it on the screen, use the drop-down **Zoom** box at the far right of the **Standard Toolbar**, or choose **View, Zoom**. To print it all, highlight the entire form and choose **File, Set Print Area**. To shrink it automatically to fit, choose **File, Page Setup, Print Preview, Pagebreak Preview**. Then drag the corners in to fit your page.

**Q** I have created a small application using Excel 97 and am using VBA code to print to a specific printer. I have been able to use the code to do everything I need except point to a specific paper tray. I am trying to print page one from the upper tray and all others from the lower tray but have been unable to find a method of doing this, can you help?

**a** You use the **SEND.KEYS()** macro function or **SendKeys** command — so you should look them up in **VBA Help**. Also, look in the **Microsoft Knowledge Base** for articles Q69614 and Q105878.

give a cell the custom format dddd and enter 25/12/\*\*\*\*

with the year you need. But I'm hoping that one of the vicars, weathermen, astronomers or sailors who have written in to this column in the past can help me with this question from Tony Askew: 'I want to calculate the Easter dates from the year 2000 onwards because my information only goes up to 1999. Is it possible to calculate this in Excel?' Actually, the Christian churches celebrate the Easter season over 50 days but I assume Tony means the Easter Sundays.

In the file, Easter.txt, on this month's PCW CD-ROM, I've listed 30 years' worth of Easter Sundays from 10th April, 1977 to 16th April, 2006. This is a starting point for anyone who believes it is possible to project future dates of this movable feast from the past.

Since the Council of Nicaea in 325 AD, the Easter festival has been celebrated on the first Sunday after the full moon following the vernal (Spring) equinox. That means it never falls before 22nd March nor after 25th April.

To arrive at the dates by calculation, rather than projection, you first have to

establish the dates of the full moon. The moon goes through a cycle of phases called a lunation and this takes 29 days, 12 hours, 44 minutes and 2.8 seconds.

• **If any reader** can find a formula, either for projecting or calculating Easter Sunday for any year, I would be glad to hear from you.

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[FIG 5]

### StockLevel query

```
SELECT TotalNoItemsSold.ItemNo, TotalNoItemsSold.Item,
TotalNoItemsOrdered.TotalNoOrdered,
TotalNoItemsSold.TotalNoSold, [TotalNoOrdered]
-[totalNosold] AS StockLevel
FROM TotalNoItemsSold INNER JOIN TotalNoItemsOrdered ON
TotalNoItemsSold.ItemNo = TotalNoItemsOrdered.ItemNo;
(Key: ✓ code string continues)
```

provides summary values. No problem. We simply modify the query above so that it writes the answer as a 'real' table to disk. This table will then be updatable, so we can change the nulls to zeros [Fig 7]. We end up with four queries which need to be run in sequence.

• **StockLevelQuery** is a make table query that generates a table called StockLevelTable.

• **ReplaceNullsWithZero** is a query that replaces all of the null values in the TotalNoSold field in that table with zero.

• **ReplaceNullsWithZero2** does the same thing for the TotalNoOrdered field.

• **FinalStockLevel** performs the calculation of the stock level based on that table.

For non-Access users, the SQL for these queries is on the PCW cover CD in a text file called DBC.TXT.

to ordering them. These items show up in the table but have no value in the Stock Level field, as [Fig 6] shows.

[FIG 6]

### The answer table

ItemNo	Item	TotalNoOrdered	TotalNoSold	StockLevel
1	Desk	220	3	217
2	Lamp	50	3	47
3	Chair	0	7	-7
4	Table	2	3	-1
5	Chest		60	
6	Bookcase	500		

Rats! This

looked simple, so why is it failing to proceed? The problem is that RDBMSes like Access are pedantically correct. When the query TotalNoOfItemsSold runs, it finds no orders pertaining to the sale of bookcases. If it returned a value of zero this would be inaccurate. The database doesn't hold the fact that zero was sold and it holds no information about how many *were* sold, so the answer that we see in the answer table is a null value.

**So far so good.** But the query called StockLevel subtracts this null value from a real value which is the number ordered; in this case 500 — this subtraction takes place in the bit of SQL that reads, [TotalNoOrdered]-[totalNosold]. If you subtract an unknown value from a known value, the only reasonable answer is that you don't know what the answer is. So, the StockLevel for bookcases is a null, which appears as a blank. This is not helpful and we know that since we have 500 in stock and haven't sold any,

the answer should be 500.

One way is to always insert a dummy order (where the numbered ordered is zero) for every item, as I have done for Chair. This enables the calculation to proceed sensibly but this solution has problems. You will always have to remember that you have dummy orders in there, otherwise when you calculate, say, the average value per order, the answer will be wrong.

**Another solution** is to take the answer table [Fig 6], replace all of the nulls with

## QUICKIES

➔ Roger Page <roger@golant.demon.co.uk> wants to know where his Toolbox toolbar is hiding in Access 97. From the menu bar select View, Toolbars and database and it should reappear.

➔ Andrew Johnson <ajohn@hitachi-eu.com> has found that when he adds a new row containing a date field in Access 97, it generates a null value if nothing is entered in it. Andrew wonders how he can set a date field back to NULL after it has been populated with a valid date. An update query should do what he needs — see the table and query called SetDatestoNull in the database on our PCW CD-ROM. This update query simply looks for specific dates (in this case, anything greater than 1/1/1990) and replaces the value with a null:

```
UPDATE ANDREW SET ANDREW.[Date] = Null
WHERE (((ANDREW.Date)>#1/1/90#));
```

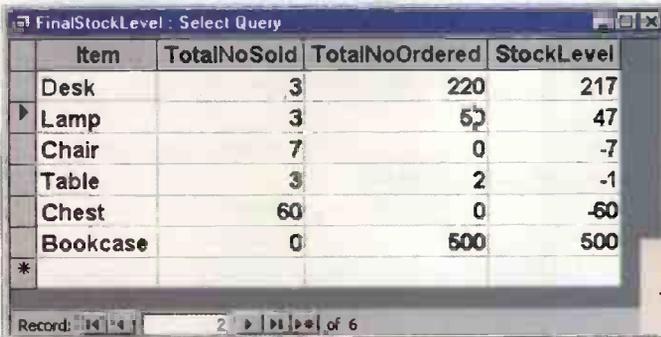
Running all four queries is a pain to do manually, so I have set up a button on a form called CalculateStockLevels that runs all four sequentially. It also has a useful command

```
DoCmd.SetWarnings False
```

which stops all those irritating warnings appearing telling you of the impending replacement of the data in the table. But finally, do remember that turning off warnings is dangerous.

## PCW CONTACTS

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◀FIG 7 THE END RESULT



# Taken as red

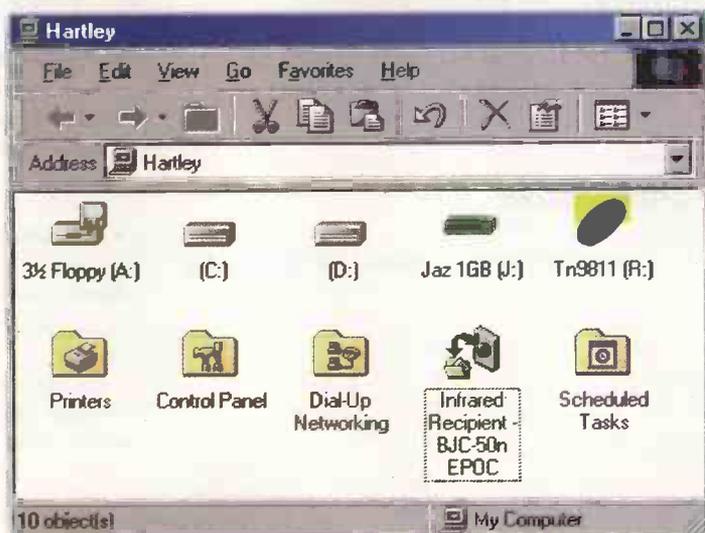
Are cable connections cluttering your life? Roger Gann has seen the future — and it's **infra-red**.

Just about everybody is talking about the Universal Serial Bus at the moment but the real unsung hero of advanced PC connectivity remains the humble infrared port, the number one alternative to ye olde serial ports. To date, more than 60 million laptops, Personal Digital Assistants (PDAs), printers, digital cameras and other devices have been shipped with infra-red ports which, like a domestic TV remote control, use a beam of pulsed invisible infra-red light to transmit and receive data.

Using infra-red beams to carry data is very convenient as it means no more fumbling with cables. But infra-red (IR) isn't just confined to taking the pain out of printing, it can carry any sort of data. Most PDAs such as the Psion Series 5 or Windows CE devices have infra-red ports. As a result, you can exchange documents between PDAs and PCs in much the same way as you can print. You simply point at the other device and press the transmit button.

You can even synchronise your PDA with your PC using infra-red. And, thanks to the latest IrDA 4Mbps Fast Infrared standard, it's also possible to connect to a network using light rather than an expensive, complex docking station or network PC Card. Connecting to a network is as simple as placing your notebook in front of the access point.

Infra-red technology is not the sole preserve of computers. The latest Ericsson and Nokia mobile phones now sport an infra-red port. Thanks to the wonders of IR, phone number and name lists can be zapped into your mobile rather than being tediously punched in, and without worrying about plugs and leads, either. Even better, with a compatible PDA, such as the Ericsson MC12 Windows CE handheld or Psion Series 5, you can connect to the internet using your mobile phone: instead of



◀ **FIG 1** WINDOWS 98 MAKES FILE TRANSFER USING IR MUCH EASIER — IT ADDS A NEW 'INFRARED RECIPIENT' FOLDER TO MY COMPUTER. SENDING FILES CAN BE ACHIEVED USING DRAG AND DROP

establishment and maintenance of a link so that error-free communication is possible.

The original IrDA 1.0 standard envisaged the infra-red port as a straight replacement for the standard 16550A RS-232C

serial port. This had a maximum speed of 115.2Kbps and so the first IrDA standard mirrored this. It was also called SIR (Serial Infrared). It quickly became apparent that this wasn't fast enough for data transfer and so, in April 1995, v1.1 of the IrDA standard was announced, also known as FIR (Fast Infrared). This permitted transfer speeds as fast as 4Mbps and was backwards compatible with the original, slower standard.

#### → The IrDA standard

For the same reasons that prevent a TV remote control from controlling any VCR, original PC implementations of IR used proprietary protocols and hence are far from inter-operable. As a result, getting two infra-red devices from different manufacturers to talk to each other was often difficult or impossible. The Infrared Data Association (IrDA) was founded in 1993 to devise an

industry standard that would offer infra-red compatibility between different brands and types of infra-red devices. Establishing a wireless data link causes all sorts of headaches compared to a conventional cable connection. Unlike a cable, which is semi-permanently attached, the ends of an IR link may move freely within and out of range which means that the link may be broken in mid-transmission. The IrDA standard defines a communication protocol which provides for the

#### → The future of infra-red

Two interesting IR developments are in prospect: IrBus, which is aimed at expanding the use of infra-red among a



▲ **FIG 2** WITH IR INSTALLED AND ACTIVE, WINDOWS 98 PUTS A STATUS INDICATOR ON THE SYSTEM TRAY. HERE, I'VE MADE CONTACT WITH TWO DEVICES

whole raft of domestic devices, and Very Fast IR which will boost the

speed of IrDA connections as high as 16Mbps.

IrBus is good news for gamers. Based on current Universal Serial Bus technology, it's designed to allow in-room wireless use of mice, keyboards, joysticks, gamepads, remote control

units and PDAs with host devices such as multimedia PCs. It can work with up to eight devices simultaneously communicating with at least two hosts and provides the kind of nippy responsiveness demanded by gaming devices such as joysticks. It's designed to offer room-sized coverage (up to 8m) and its low speed (75Kbps) will mean low battery consumption. For more information, contact [www.irbus.org](http://www.irbus.org).

Very Fast Infrared (VFIR) is a new 16Mbps IrDA standard proposed for use with PDAs and devices such as digital cameras. With digital picture resolutions reaching a million or more pixels, each picture will take a considerable time to download, even at 4Mbps. VFIR is the solution, it is four times faster and can transmit and receive data at distances of up to 1m and, like the earlier IrDA 1.1 standard, it can also be used in place of a serial port to transfer files or to send to a printer. VFIR could find a home in units such as portable storage devices, mobile phones and handheld scanners.

➤ **Infra-red hardware**

Of course, to use infra-red you need to have the right hardware. Most, if not all, current notebooks have IrDA ports as standard and the same is also true of most PDAs. But that's the end of the good news. The range of other devices blessed with IR ports is considerably narrower. For example, only a handful of Hewlett-Packard printers (the Laserjets 5 and 6P/MP as well as the portable Deskjet 340), and the new portable BJC-50 Canon printer have them.

We run out of luck completely when we turn to desktop PCs. None are equipped with IrDA ports as standard. However, thanks to IrDA's murky serial-port roots, many PC motherboards do make some sort of provision for an IrDA port. This normally takes the shape of a header connector on the motherboard to which you can attach an inexpensive infra-red transceiver which you'd obtain from the dealer that sold you the motherboard or, at a pinch, somewhere like Maplins. Check your motherboard manual for more details.

Or, you can buy a plug-in adapter such as those sold by Extended Systems [www.extendedsystems.com/products/infra-red/](http://www.extendedsystems.com/products/infra-red/). The JetEye PC (£69 ex VAT) plugs in to your PC's serial port and offers IrDA-compatible data transfer at speeds of 115.2Kbps over a 1m range.

The JetEye Printer (£99 ex VAT) plugs in to a printer's parallel port and as well as permitting infra-red printing it also has a pass-through connector letting you plug in an ordinary printer cable as well. The JetEye Net/Net Plus modules (from £225 ex VAT) allow infra-red-equipped portables to connect to a network at 4Mbps without the hassles of cables and PCMCIA cards.

➤ **Windows 9x and IR**

The original release of Windows 95 didn't actually ship with any support for infra-red devices, so you have to download the IR drivers from the Microsoft web site at [www.microsoft.com/windows/downloads](http://www.microsoft.com/windows/downloads). Version 2 of the IR drivers is available for Windows 95; look for W95IR.EXE, a 434Kb download. This supports IrDA 1.0 and 1.1 — that is, transfer speeds of 115.2Kbps and 4Mbps — and most notebooks will come with Windows 9x IR support already installed.

With this software installed you'll be able to print using IR, but if you wanted to transfer files you'd typically need some additional third-party software such as TranXit, or recent versions of LapLink. It is, however, possible to use Windows 95's Direct Cable Connection to network two PCs, linking them via their IR ports

rather than a cable.

Windows 98 comes with Microsoft Infra-red 3.0, which lets you connect to networks as well as print and transfer data. And, with this version, you no longer need special file transfer software as Windows 98 now comes with Infrared Transfer — downloadable from the [microsoft.com](http://microsoft.com) website address above — a new application for transferring files via an infra-red connection.

When an infra-red device has been installed, an icon called Infrared Recipient is added to My Computer [Fig 1] and an extra item is added to the Send To menu option which appears when you right-click a file or folder.

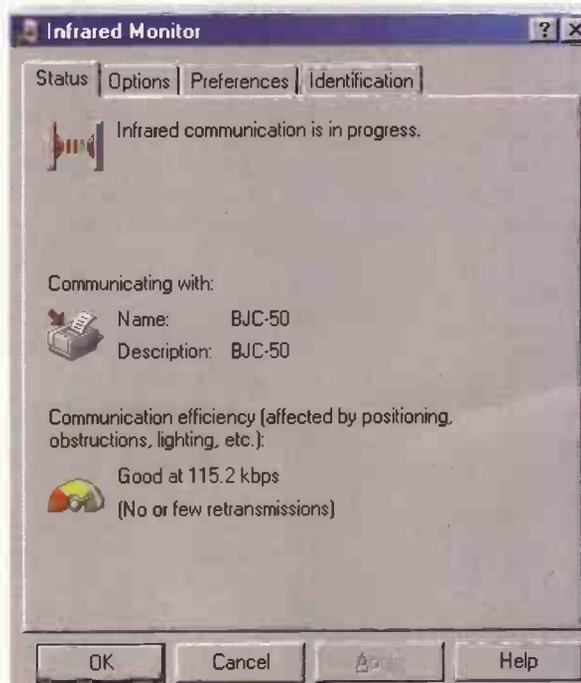
To send a file via infra-red involves right-clicking a file and selecting Infrared Recipient from the Send To list. The first time Infrared Transfer is used to send a file or folder, a folder called My Received Files is created and all sent files or folders will be copied to this.

*Using infra-red to print really does rival falling off logs*

➤ **Infra-red in practice**

Using infra-red to print really does rival falling off logs in the simplicity stakes. With Windows 9x infra-red support installed, a little IR port icon is displayed in your Taskbar. It flashes away, indicating that Windows 9x is constantly

checking for the presence of any IR devices in range [Fig 2]. When one is detected, you get an audible alert and the icon changes to a pair of IR ports. If you click on these, the Infrared Monitor dialog opens up. This tells you the name of the device and, when you're actually sending data, the



◀ **Fig 3**  
 WHEN YOU'RE SENDING OR RECEIVING DATA VIA IR, THE INFRARED MONITOR REPORTS ON RECEPTION QUALITY/EFFICIENCY



## THE KATMAI'S OUT OF THE BAG

The next major processor release from Intel, touted as the replacement for the Pentium II, is finally called the Pentium III. Initially a 0.25µm processor — 018µm processors will arrive with the 600MHz versions in the second half of this year — it will sit in a standard Pentium II Slot 1 and feature 70 new multimedia-friendly instructions, formerly called KNI or Katmai New Instructions but now officially labelled 'Streaming SIMD Extensions'. Also featured will be support for a faster graphics bus (AGP 4X) and a new DRAM technology, DirectRAMBus.

The system bus is also to be speeded up to 133MHz, a rate which some BX motherboards offer already, although Intel is readying the forthcoming Camino chipset for this purpose. At first, though, Katmai processors will run at 100MHz.

The server/Slot 2 version (formerly 'Tanner') won't surface until the second quarter of the year. The Coppermine desktop/mobile version will follow later and will probably run at 600MHz although with the present half-speed L2 cache found on current

Pentium IIs. The end of this year will see the release of the Cascades CPU, which runs at an estimated 750MHz.

**Katmai could spell the end** of the K6-2 as the gaming CPU of choice. The new instructions are mainly designed to enhance 3D gaming, but other tasks will benefit as well. For instance, speech recognition, surround sound, AC3, physical modelling and imaging. They offer SIMD (Single Instruction Multiple Data) operations on single precision floating point values, which is one of the most important things for 3D games computing.

This isn't new; AMD's 3DNow! technology incorporates a similar set of instructions. But with Katmai, Intel has taken a different, more sophisticated approach. SIMD-FP introduces eight new 128-bit (4 x 32-bit wide) single precision-packed CPU registers, enabling simultaneous computation of four single precision FP variables. By contrast, the AMD's K6-2 has eight 64-bit (2 x 32-bit) registers.

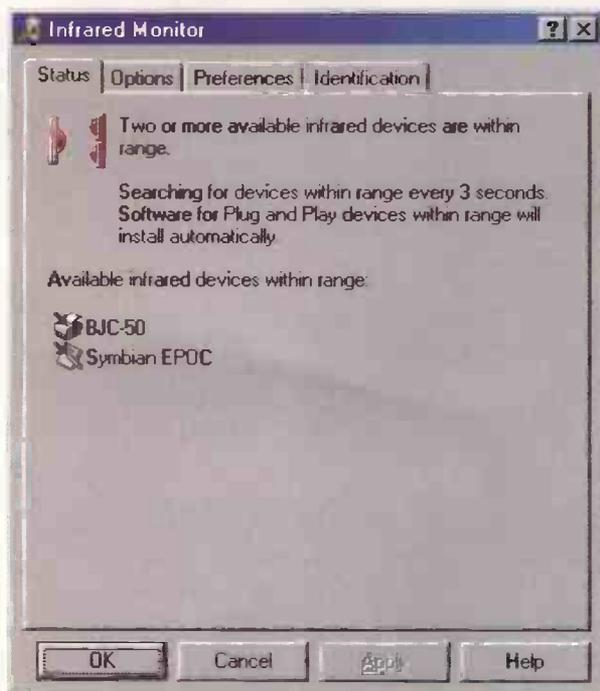
**Also new to Katmai** is a new, separate processor state or mode to

take advantage of those registers. This is the first new Intel processor mode since the 386 that was introduced more than ten years ago. It will require a patch for Windows 98 but Windows 2000 will support it by default.

The new processor state will enable concurrent use of either SIMD-FP and MMX, or SIMD-FP and IA-FP double-precision floating point code. This is something that is not possible with the existing MMX and 3DNow! architectures which offer the choice of either MMX or FP but not both. Incidentally, the existing MMX instruction set has also been added to.

**Katmai** has one final performance booster up its sleeve — a new memory streaming architecture. This accelerates the P6 bus, by 'hiding' memory latency effects on CPU performance via a new pre-fetch mechanism. This can improve MPEG-2 encoding/decoding as well as operating systems, server and workstation applications. Intel predicts performance improvements of five to 20 percent as a result of this new feature.

• A Katmai feature with five tested PCs starts on page 122.



◀**FIG 4 THE INFRARED MONITOR CONTROL PANEL** APPLETT TELLS YOU WHAT OTHER DEVICES ARE IN RANGE. HERE, MY PSION SERIES 5 AND A CANON BJC-50 PRINTER CAN BE DETECTED

'quality' of the link it has achieved [Fig 3].

Once a printer has come into range [Fig 4] you can print, as though it were attached to your PC by a printer cable, in the normal way. The only thing to watch is that you've configured Windows 9x to connect to the printer via the IR and not the normal printer port. To check this,

click Start, Settings, Printers then right-click your printer and select Properties. On the Details tab select the port you want to use from the pull-down list. Normally, this will be LPT3 (Infrared Printing [LPT] port).

It's not all sweetness and light, though. To get a good, reliable IR connection some simple rules must be observed. Forget all you know about TV remote controls; these infra-red devices are very different. The two IR ports have to be pretty close to each other; less than a metre apart but often half this figure, which is often a royal pain. They've also got to be more or less pointing at each other to connect. In short, the IR ports must be virtually touching!

### PCW CONTACTS

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# Sitting comfortably

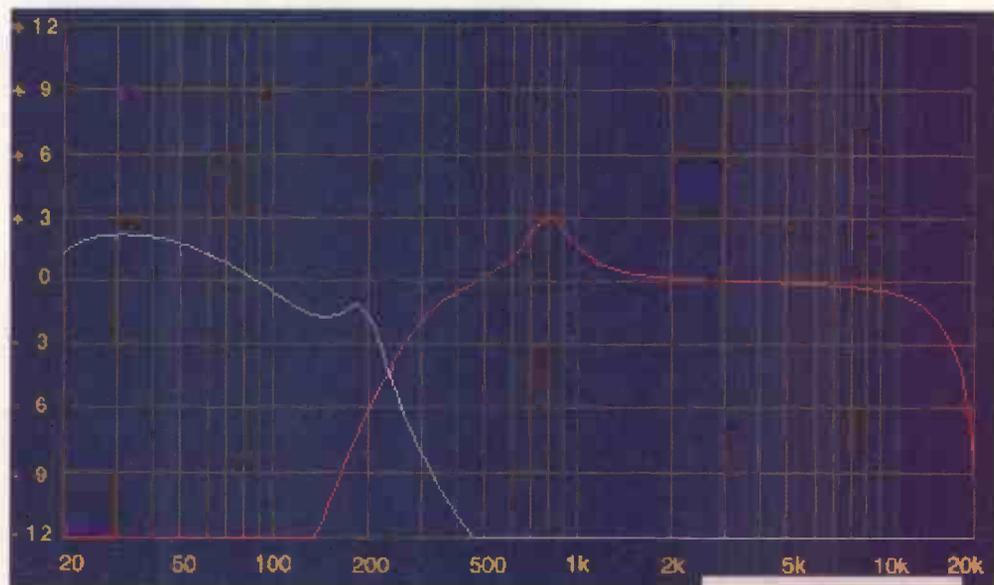
Use EQ to make a sound sit well in your mix. Steven Helstrip explains.

**T**o continue our mini-series on mixing audio, we're going to look at EQ in more detail and explain where, when and how to use it. Although EQ can be used as a creative tool, its main purpose is to shape and control a sound so that it 'sits' well with other instruments in a mix. But what does that mean, exactly? When mixing a track, what we're aiming to do is to make each instrument come across as clearly as possible over the speakers. We can do this with EQ by separating (or partitioning) instruments into their own spaces within the audio spectrum. Of course, there's a good deal more to mixing than EQ alone, but this is a good place to start.

**The more instruments** or parts you have playing in a song, the more difficult it becomes to mix them. We can illustrate the problem with this simplified example. If two untreated bass instruments play simultaneously, they are likely to sound cluttered as, by their very nature, they occupy similar frequencies in the audio spectrum. However, they can work together well if they are separated into their own spaces.

There are three ways to achieve this effectively. The most obvious is not to play them in the same place. It's often overlooked as a basic principle of production — less can be more. The second approach is to pan them to opposite speakers, although this may not always be appropriate. If neither of these work, then EQ has to come into play.

Fig 1 shows how two bass-type sounds might be EQed to fit into separate frequency ranges. The red EQ curve has had most of its bass frequencies filtered out (or rolled off) to



▲ FIG 1 EQING TWO BASS-TYPE SOUNDS

allow the instrument, represented by the blue curve, space to breathe. There is some area of overlap but this is perfectly alright given that it's a relatively small range. Conversely, the blue curve has had much of its higher frequencies filtered out. In addition, you can see that each curve has a bell-shaped peak where gain has been applied to bring out a particular quality in each instrument's tone.

**The art of mixing** can take years to master but you can improve the sound of your music with a basic understanding of EQ. By far the best way to learn is to get some direct hands-on experience. So

what are you waiting for? Here are ten general guidelines to help you get started. And if you need an EQ or filter plug-in, we've got that

covered, too, in the panel overleaf.

**1 Before you reach for the EQ,** ensure that you have done everything possible in the recording process to get the right sound onto disc in the first place. Careful sound selection can keep the use of EQ to a minimum.

**2 Don't spend too long EQing** an instrument in isolation as it will sound totally different once it's back in the mix.

## 3 Cutting frequencies

you don't want, rather than boosting those that you do, can be just as effective and helps to open up a sound.

**4 Listen carefully** to how commercial tracks are mixed. This is by far the best way to learn how to approach your own mixes. Also, take time out to practice and experiment.

**5 To add a click** to a kick drum, boost the frequencies around 6KHz. To help it 'bite' through the mix, boost around 2KHz.

**6 To add clarity** to a bass instrument, cut the frequencies around 250-300Hz. A boost of around 100Hz will add body and weight.

**7 Take the abrasion off hi-hats** by cutting from the 1-2KHz range. Meanwhile, sparkle can be added by boosting the frequencies around 10-12KHz.

**8 Vocals generally sound warmer** when you cut around 1KHz, while boosting the 2-3KHz range adds presence.

**9 To make pads sit back** in a mix, cut the frequencies around 2-3KHz. A boost around 8KHz will add clarity.

**10 Leave any final EQing** until the following morning if you can. Your ears will be fresh and any problems will be easier to spot.



### Questions & answers

**Q** I have a problem recording melody lines into my sequencer because my keyboard skills are minimal. Entering notes in step time is not satisfactory as there is no natural flow. Do you know of a program

**Fig 4** SOUND 2 MIDI TAKES AN ANALOGUE SIGNAL FROM YOUR SOUND CARD'S EXTERNAL INPUT AND CONVERTS IT TO MIDI



which would take an input from a microphone and convert it to MIDI so that I could sing, hum or whistle the melody and then assign an instrument to it? I can string a few chords together and have no problem with bass lines but a naturally flowing melody defeats me.

BERNARD MANTELL

**a** There is a program called Sound 2 MIDI which will do just that. It runs alongside your sequencer and can take an input from either mic or line inputs. Once it knows the key and the mode of the music it's about to transcribe [Fig 4] all you have to do is hit record in your sequencer and, er, sing. I just hope you can sing

in tune! See the PCW Contacts box for details.

**Q** I have some old four-track demo tapes that I'd like to transfer to my PC for digital editing. Do I need a dedicated four-input sound card to record them or can I simply buy a cheaper, second stereo input card to use with my Sound Blaster 16?

PAUL WARD

**a** The problem with using two separate cards for recording and playing back multiple channels is that each card's audio clock source may run at different speeds. Although we're only talking about tiny fractions, over a few minutes the two cards will almost certainly drift out of sync, even if they're the same type. From what you have described, though, you don't actually need four inputs. Simply record the tracks off

tape two at a time and use your audio editor to line up the separate takes — that's the beauty of digital editing.

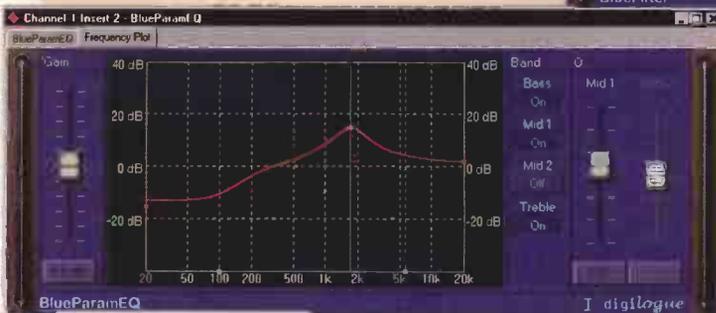
**Q** Do you know of a program that can convert and compress to and from various audio formats and has a batch mode (like Paint Shop Pro)?

ALEX HELFET

**a** Two shareware programs spring to mind. The first is Convert, a DOS-based command-line utility. It supports around 50 audio file formats and provides basic batch processing. It's straightforward to use but if you'd prefer a Windows application, check out Awave, which supports nearly 200 file types including SoundFonts and Mpeg. But it doesn't have the batch processing facility. So, best get both, then. These programs are available from [www.maz-sound.com](http://www.maz-sound.com).

### DIGILOGUE BLUELINE PLUG-INS

There's no shortage of free plug-ins on the internet but I've never before come across anything so complete as this. BlueLine is a suite of 11 plug-ins for VST and DirectX-compatible applications. It's a great set but the two in which we're particularly interested are filter and EQ



**Fig 2** DIGILOGUE'S EQ MODULE PROVIDES FOUR FULLY-PARAMETRIC BANDS WITH ADJUSTABLE Q

modules [Figs 2 & 3]. Together, they provide everything you need to start mixing, including four fully-parametric bands on

EQ and no less than 16 filter types. Although both are big on features, they actually use very little processor overhead and should work with any system, so now you've got no excuse!

**Fig 3** THE BLUELINE FILTER OFFERS 16 FILTER TYPES WITH LEVEL TRACKING

### PCW CONTACTS

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Digilogue BlueLine plug-ins <http://members.tripod.de/digilogue/> Sound 2 MIDI £99 (£84.26 ex VAT) from Et Cetera Distribution 01706 228 039

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# Font friends

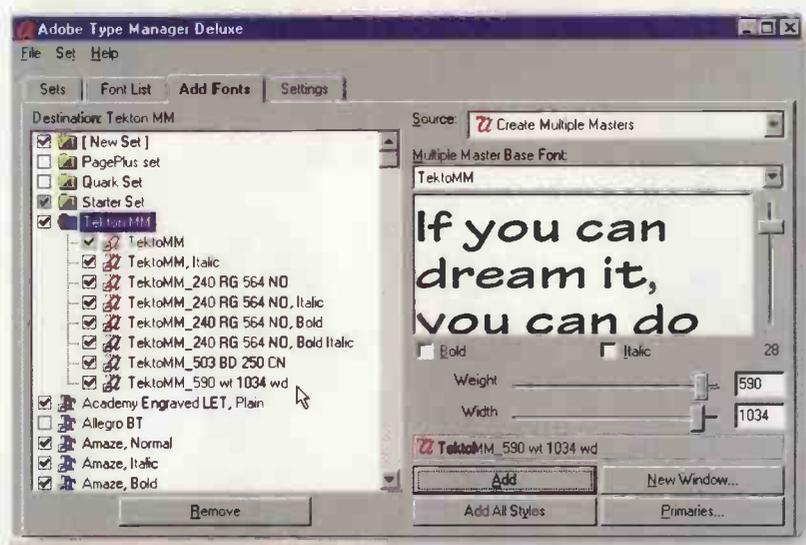
With Multiple Masters fonts you can achieve **typographic control**. Ken McMahon explains.

**E**ver wish you had more weights in a particular font family? Bold too heavy, regular too light, but no semi-bold to be had? Then you need Multiple Masters. They are an extension of Adobe's Type 1 font format. Multiple Masters differ from conventional Type 1 fonts in that they contain a number of font outlines, or master designs, for each character and software that morphs between them.

**Multiple Masters enables you** to vary a font's attributes in one of up to four ways: weight, width, style and optical size [Fig 4]. Imagine the master designs as being at opposite ends of a design axis controlling each of these four attributes. By picking a point anywhere on that axis you can determine the appearance of the font. No more extra light, bold, semi-bold and heavy — just a smooth, incremental increase in weight, width and so on, controlled by means of a slider.

Since Adobe introduced Multiple Masters (MM) in 1996 there has been a slow but steady stream of fonts appearing on the market. At the last count Adobe boasted 33 and other type foundries have produced Multiple Master versions of their fonts. As you'd expect, Adobe's applications provide MM support and you can create Multiple Masters from within PageMaker and Illustrator 7 and 8 as well as using the editor that comes with the MM font itself [Fig 1].

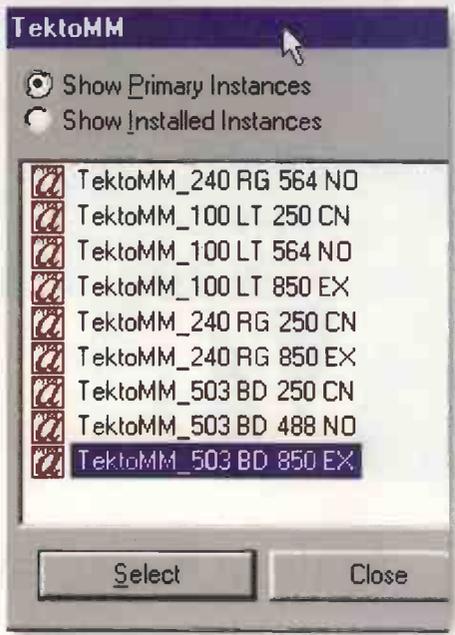
You can also create and edit MM fonts using ATM deluxe 4.0 which comes



**▲ FIG 2 ATM'S PREVIEW WINDOW SHOWS YOU EXACTLY HOW THE NEW INSTANCE WILL LOOK BEFORE YOU ADD IT TO A FONT SET**  
**▶ FIG 3 ATM LISTS THE ENTIRE FONT DESIGNER'S 'PRIMARY INSTANCES'**

with its very own MM font, Tekton MM. As well as the Master designs (those at the extremes of the axes) most MM fonts are supplied with 'primary instances' created by the font designer.

**Primary instances** are versions of the font created by adjusting the design co-ordinates, moving the sliders along the axes until you achieve the desired combination of weight and width. Tekton is a two-axis Multiple Master so you can alter its weight and width. Other Multiple

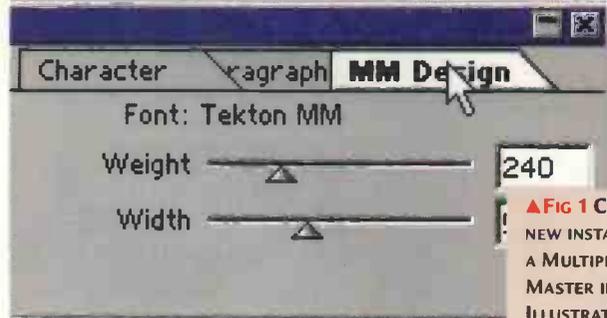


Master fonts also allow you to alter the style from sans to serif, as well as the optical size, optimising a font's appearance for any point size.

To install a primary instance of Tekton MM in ATM Deluxe

4.0, click the 'Add Fonts' tab and select 'Create Multiple Masters' from the source pull-down menu. Select TektonMM as the Multiple Master Base font — unless you have bought others, this will be the only one — and click the Primaries button.

These [Fig 3] are all the Tekton Primary Instances created by the font designer. In case you're wondering about the weird names, the first part is the font family name, the first group of numbers



**▲ FIG 1 CREATING NEW INSTANCES OF A MULTIPLE MASTER IN ILLUSTRATOR 8 IS SIMPLE**

## Questions & answers

**Q** I am looking for an application to simplify the tweaking and enhancement of photos. I don't have Adobe Photoshop (I can't justify the price as a home user) but visited the Extensis web site for more info because I wondered whether there might be a version for PaintShop Pro 5.0 (PSP). There isn't. Can you recommend similar software which might also produce good results — either standalone applications or compatible with PSP? Are there plug-ins for PSP?

ANDY WILLIAMS

**a** Good news. You can use Extensis Intellihance (reviewed in Hands On Graphics & DTP, January) and any other Photoshop-compatible plug-ins with PaintShop Pro 5. You don't need a special version of the plug-in for PSP 5.0, or any other application. Any image editing application which supports the Photoshop plug-in architecture will do the job.

**Q** Why tell Michael Phoenix [PCW, January] to upgrade when it's very easy to do what he asks with CorelDraw3? That is: type the letters, draw a rectangle, combine text with rectangle, place in front of flag available in CD3 Clipart. PCW starts to look like a tool of the computer industry when most advice includes the suggestion to upgrade.

DAVE SPATHAKY

**a** If I still had a copy of CorelDraw 3 I'd give it a go. But if I recollect correctly, having spent the best part of an afternoon installing it I'd most likely spend the rest of the day trying to get it to print without error, which is probably why I binned it. Printing imported bitmap graphics with vector clipping paths is one of the things most likely to generate a PostScript error or other, more serious, problems — stability was not one of CorelDraw 3's big features. I know that my suggestion works because I've tried it,

without problems. If yours does, too, thanks for the tip and Michael Phoenix can save himself a few quid.

On the general point about upgrading I would agree that upgrades are a waste of money if the application version you are using does everything you need. But there are so many reasons for upgrading from a product that was designed more than five years ago it's hard to know where to begin listing them.

Just some of the things I would find it hard to live without if CorelDraw 3 were my only vector drawing application, would be decent colour support including four-colour process separation and Pantone support as well as colour style sheets. Web

support including HTML export, would be on the list as

would vector to bitmap conversion, png and jpg file support, special effects filters and lenses, transparency, blends, natural pen tools, scripting, style sheets, the object manager... I could go on, but I'd better stop there as

I'm beginning to sound like a tool of the software industry.

If you were dogged by PostScript printing errors then I'd advise you to check out Laurens Leurs' PostScript Panic Page at [bewoner.dma.be/leurs/](http://bewoner.dma.be/leurs/). Here you'll find out what PostScript errors are and how to avoid the abject misery of having to overcome them. If it's too late for prevention, there's a small database of error messages, together with fixes. There's also information on software to help track down and destroy Postscript offenders before they become a threat to your printed words and pictures and there are links to other sites dedicated to the eradication of the scourge of PostScript errors.

Laurens handles customer support for Agfa Imagesetters in Belgium so he should know his stuff. He reckons the time spent on his site varies in proportion to the dire quality of Belgian TV; the worse it gets, the more time he spends compiling his database of PostScript errors. We can only hope that the Belgians are top of the list for British TV exports of anything featuring Cilla Black or Carol Vorderman.

## Are there plug-ins for Paint Shop Pro?

Some of the possible multiple master design axes



You can vary one multiple master typeface in thousands of ways to find the right solution for your documents.

◀ **FIG 4 THE APPEARANCE OF MULTIPLE MASTER FONTS IS INFINITELY VARIABLE ACROSS FOUR DESIGN AXES**

is the weight and the second the width. The uppercase two-letter labels are Adobe's standard type attribute identifiers — LT is light, EX is extended, and so on. So you already have much more than you would get with a standard Type 1 font. But you can go further. To create your own customised 'instance' just start with one of the primaries then drag the

weight and width sliders until you like what you see in the preview window, then click the add button [Fig 2]. This time there are no Adobe-style symbols, just the two numbers — in this case 590 and 1034 followed by lower-case symbols indicating weight and width.

You can find details of all Adobe's Multiple Master fonts including two recent releases, Verve MM and Reliq MM at [www.adobe.com/type/browser/c/c\\_4e.html](http://www.adobe.com/type/browser/c/c_4e.html).

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# Taking the Linux line

Linux is a tempting, low-cost alternative to NT for 3D graphics people. Ben Woolley tries it out.

**E**ncouraged by the good work of my neighbour a few pages down the magazine, Chris 'Unix' Bidmead, I have been eyeing-up Linux. It has particular relevance to 3D graphics enthusiasts and pros because it apparently offers the chance to set up a fully-fledged workstation operating system on a basic hardware platform, more or less for free. So, it seems like a tempting alternative to Windows NT. Most of the major 3D authoring packages for Intel systems — 3D Studio MAX, Lightwave, trueSpace and so on — run under Windows NT 4. Windows NT, however, costs over £200.

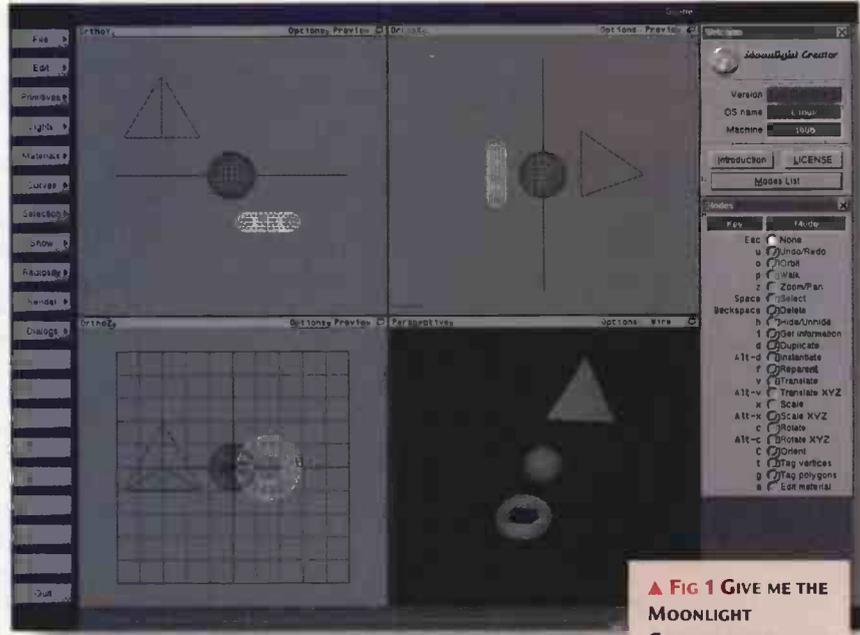
**Is Linux a serious contender?** I got hold of a copy of SuSE Linux 5.3 — it is one of the 'official' distributions costing around £30 — to find out. Its CD case promised to 'turn your PC into a workstation'.

Many *Hands On* readers will have read Chris Bidmead's excellent *Workshop* feature (*PCW*, Jan-Mar '99) on setting up Linux, so there is no need to go into detail here. However, there are a few observations I would like to make. The SuSE user manual offers the option of a 30-minute installation. God may have created the universe in six days, but I think even He would have difficulty in setting up a Linux system in 30 minutes. By the time I had got to grips with partitioning, basic Linux concepts, and had sorted out all the device drivers I needed, a couple of days had disappeared.

**Its CD case promised to 'turn your PC into a workstation'**

**I installed Linux** on a separate partition on my hard disk. Windows remained my primary OS and I booted Linux using a startup disk. There is a way of launching Linux from within Windows itself but I found that this created problems with some of the Plug'n'Play devices; particularly the network card.

One of the first things you notice about Linux is that the core or 'kernel' is small so you can get the lot onto a



**▲ FIG 1 GIVE ME THE MOONLIGHT CREATOR... AND HAVE SOME FUN WITH BASIC MODELLING TOOLS**

floppy, with room to spare. Because the source code is publicly available and conveniently supplied on the distribution CD, you can even compile your own kernel. This enables you to configure an extremely tight graphics system with all the drivers needed to deal with the hardware installed, included in the core code. It's just the thing for creating a rock-stable system.

**A crucial component** for a 3D system is a fully-operational X Server. This provides the services nearly all graphics programs

use to provide a Windows-like graphical interface. I configured the X Server on my

system without too much difficulty. It ran smoothly on my Matrox Millennium II AGP card at high resolutions and in true colour.

But what was there to run? It is all very well having a nice, tight workmanlike OS, but it is obviously useless if it doesn't run the software you want. Neither 3D Studio MAX nor Lightwave run under Linux, nor do most other mid-range Windows packages. This is a

disappointment and I would urge all the companies concerned to port their products as soon as possible. Still, until they do, there are other packages to be going on with and one of these is a fully-fledged commercial product called GIG3DGO — I will look at this in more detail in a future column.

**The SuSE distribution CD** actually includes at least three 3D packages. One of them is Povray <[www.povray.org](http://www.povray.org)>, a raytrace renderer. I also found a modeller called Sced, which can be used to create and texture simple objects for rendering with Povray. Sced is an X application, which means it runs in an X window. There is also an X version of Povray which outputs the rendered scene to an X window. The real excitement began when I started to play with two fully-fledged authoring packages that were also bundled onto the SuSE distribution CD; Moonlight Creator and Blender.

**Moonlight Creator [Fig 1]** by Stephane C. F. Rehel is a simple but quite powerful OpenGL-based modeller and renderer which offers such luxuries as NURBS (see last month's column) and Radiosity

rendering. Given that it is still in development (I used version 0.41) it seemed to be remarkably robust and quite easy to use. The materials editor did not seem to be fully implemented and there is scant documentation, but what there was worked very well. The only problem was the website <[www.cybersociety.com/moonlight/](http://www.cybersociety.com/moonlight/)>, which seemed to be uncontactable.

► **FIG 2** THE OFTEN PUZZLING BLENDER INTERFACE — THE PANELS ON THE RIGHT-HAND SIDE SHOW ANIMATION TRACKS AND OBJECT HIERARCHIES



**Blender is the other package** bundled with the SuSE distribution of Linux [Fig 2]. This is a strange piece of 3D software. When you first launch it, you find yourself propelled into an alien world a little like trueSpace. There are none of the usual features to be seen: no top/front/side/perspective view of the scene being edited, just one large perspective window. And there is neither a menu, nor palette, nor toolbox, just a series of panels scattered with baffling buttons and charts. However, it does seem to be a very powerful package, with most of what you need to create impressive animations.

I will continue to work at it for the next few weeks to see whether I can make any

**Because the source code is publicly available, you can compile your own kernel**

sense of it as it seems likely to reward the effort because not only is it free, but also well specified. The documentation is scant and provisional, and there seem to

be some inconsistencies with the version I was using. However, there is a very professional website at [www.neogeo.nl](http://www.neogeo.nl) from which you can order a manual.

You can also download free tutorials

as well as example files, and this helped me at least make a stab at

mastering this strange piece of software.

In their current state, neither Blender nor Moonlight Creator would be suitable for professional work but they are

nevertheless fascinating pieces of software. And, in conjunction with the very sophisticated Povray renderer, they perhaps provide a basis for doing some interesting work to build up a portfolio. At the time of writing, all are available to download from the web for free like Linux itself, or you can buy Linux on CD for £30-£40, with the packages bundled, from a company like SuSE or Red Hat.

I would recommend that those with some time to spare and a burning enthusiasm to experiment with both a powerful operating system and some interesting 3D software to have a go at Linux.

## Questions

### & answers

**Q** I'd like to go on a course to learn 3D Studio MAX and would appreciate some details on this. I own an Intel Pentium II 233MHz with 64Mb RAM and an AGP card but want to buy a new card. Could you suggest one which would let me gain full control over Studio MAX?

SCOTT BAILEY

**a** This is quite a common question. You can often find out about local courses from dealers who specialise in 3D graphics products. There are not that many around but in London, which is my neck of the woods, Rosswood seems to be the leader in the field, at least when it comes to 3D Studio. The company maintains a useful website at [www.rosswood.com](http://www.rosswood.com) and has a training centre at Aylesbury, in Buckinghamshire. Some art colleges and universities also

offer training but this is usually as part of a wider degree course.

The second part of your question is difficult to answer because there are so many cards and the market is changing too quickly. One piece of advice I give to anyone who asks me about display adapters is to remember that support, and driver support in particular, is crucial. Before buying a card from a particular manufacturer, do check out

the company's website to see whether it updates its drivers, particularly for older cards, on a regular basis. Also, if you go to one of the sites for Linux suppliers (SuSE and Red Hat, for instance) you can check out which cards are supported by the X Window System.

### PCW CONTACTS

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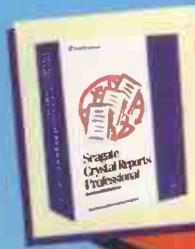
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'Data Junction - data conversion, source or target most databases, including EBCDIC, ASCII etc'



## Installation & Help Authoring

RoboHelp Office 7.0 - New version	£436
Doc-To-Help 4.0 - New professional version	£499
CodeWright 5.1 Professional - Programmer's editor	£178
PC-Install 6.0 - New version, many new features	£125
InstallShield 5.5 Professional	£493
InstallShield Express Professional 2.1	£159
Wise InstallBuilder	£275
RoboHELP Classic	£294
ForeHelp - New version 3.0	£259

Build help files and setup routines. Doc-To-Help 4.0 supports innovative Win95



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# Help with help

Despite performance problems it is **worth persevering** with HTML Help. Tim Anderson guides you.

**T**here has been some muttering and grumbling about Microsoft's adoption of HTML help as the new Windows standard. It is becoming hard to avoid since Visual Studio 6 uses it throughout, as does Office 2000. Many non-Microsoft Windows applications continue to use the old-style help and an Adobe Acrobat version of help is also becoming widespread despite its unsuitability. The main objection to HTML help is that it is slower than Winhelp and, in the case of Visual Studio, less well integrated. The reason for performance problems is not hard to find: the display engine is the embedded Internet Explorer, giving Windows a lot of work to do when you press F1.

Despite these problems, it is worth persevering. The browser wars mean that HTML is not a settled standard, but it is a lot closer than the old help system which is based on RTF (Rich Text Format). RTF itself is not so bad but Microsoft's help compiler is fussy about what variety of RTF it will accept and the whole system depends on using footnotes, superscripts, hidden text and the like for all sorts of obscure purposes. In other words it is a hack whereas HTML was designed to provide features like the hyperlinks and scripts which make online help tick. A nice feature of HTML help is that you can use the same source for a web site as well as a compiled help file.

If HTML is the way to go, why use Microsoft's semi-proprietary compiled

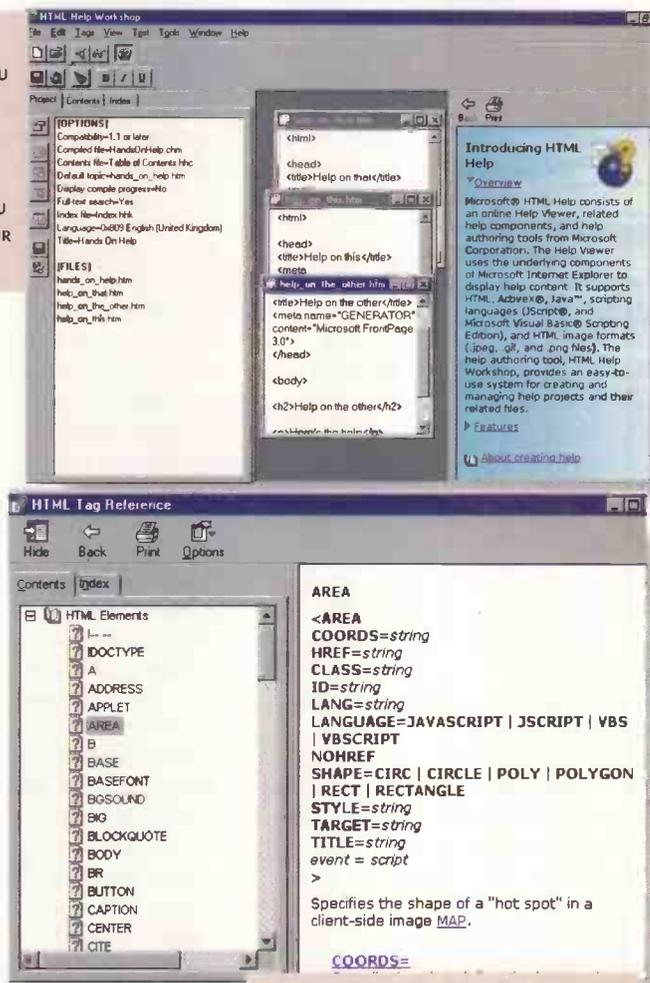
**▶ THE HTML HELP WORKSHOP LETS YOU ASSEMBLE, COMPILE AND TEST ONLINE HELP. NOTE THE DOCKED HELP WINDOW, WHICH YOU CAN EMULATE IN YOUR OWN APPLICATIONS**

HTML rather than just providing a directory full of HTML files? The main reason is to integrate with applications. Compiled HTML help provides an API similar to Winhelp so you can offer context-sensitive help. You also get full text search for free.

Another factor is that while it is nice to give users a choice of browser, it also increases the chance of script or display errors. The hierarchical contents tree of HTML help is hard to achieve in standard HTML. If it is important to work cross-browser or cross-platform, you can use a provided Java applet which supports the contents tree although performance is not as good as with the compiled version.

### ← Using HTML Help Workshop

To get started with HTML help, you need to obtain the HTML Help Workshop. I recommend at least version 1.2 which is more up-to-date than the one in the Visual Studio 6 shrink-



**▲ BUNDLED WITH THE HELP WORKSHOP IS THIS EXAMPLE OF HTML HELP — A HANDY TAG REFERENCE FOR INTERNET EXPLORER**

## NetManage controls

**S**everal readers have asked where to find the NetManage ActiveX Internet controls mentioned in a recent column. These controls also go by the name of Microsoft Internet Control pack or, following a change of ownership, the

Netmasters Fastnet ActiveX controls. They once had a reputation for bugs but according to Netmasters the latest version, 7.02, is more reliable. The 7Mb download, is free from [www.netmastersllc.com/fnax.html](http://www.netmastersllc.com/fnax.html).

wrap. It is a free download from Microsoft's web site and is worth having, if only for its extras like the HTML online reference and the neat screen capture utility. Let's get started:

- First, create a few HTML pages. Or you might like to try it on an existing set of HTML pages copied to a working directory.
- Next, open the workshop and start a new project. You will be prompted to add any existing files, which in this case will include HTML pages but not the special contents and index files used by HTML help. If you are impatient, you can now choose File -> Compile, select a name for the compiled help, and create a .CHM help file straight away. To get some



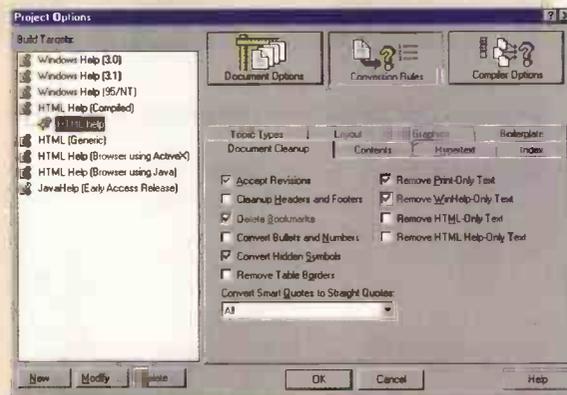
# DOC-TO-HELP PROFESSIONAL

Steve Wexler is the president of WexTech systems. Its main product is Doc-to-Help, a set of Word macros which enable you to produce printed manuals and online help from a single source. Steve has also written the Official HTML Help Authoring Kit, a Microsoft Press title that explains how to use the help workshop. HTML help is easier to author than the old help documents, making third-party tools less necessary, although there is still scope for adding value.

If you are committed to single-source documentation though, Doc-to-Help will be worthwhile. It is also handy for the indecisive as it builds Winhelp, HTML help and even has the

beginnings of JavaHelp support. JavaHelp builds help into a Java archive (.jar) file.

One of the key features is an Apply Conditional Text dialogue that lets you specify a block of text for inclusion only in specific targets such as in print but not online. Doc-to-Help can also map Word styles to those in RTF used by Winhelp, or to cascading style-sheets for HTML. It is an impressive tool although it has become flexible to the point of confusion. Many features are specific to Winhelp, which is confusing if you want to use HTML.



If in fact you do want to target Winhelp, note that most of the new features are for HTML so you may not need to upgrade.

▲ DOC-TO-HELP'S PROJECT OPTIONS — ARE THEY FLEXIBLE TO THE POINT OF CONFUSION?

added value, select the Project tab and click the Options icon. On the File tab, check the option to Automatically create a contents file. Next, on the compiler tab, check the option to Compile full-text search information.

**Now try the compilation again.** The help workshop creates a contents tree based on the heading levels in your HTML files, which means it will do a good job if the originals are well structured. It will also build a full-text index. I tried this on a simple web site and was impressed with the results. In many ways the compiled version was more usable than the original and even features like downloadable files still worked. Of course, this would not be the case if the site uses features that require a web server. If you have HTML files which would benefit from full-text search, it might be worth building them into a .CHM file for this feature alone.

► **Programming HTML Help**  
If you decide to switch to HTML Help, the first thing you'll want to know is how to provide context-sensitive help. This works in much the same way as before. The idea is that each page in your help file has an identifier which you can include in calls to the HTMLHelp API function.

If you are using Visual Basic, you can avoid the API completely by setting the application's HelpFile property to your

.CHM file and setting the HelpContextID property of forms and controls to the ID of the appropriate help page. Unfortunately there is a messy aspect to this. The HelpContextID property is an arbitrary long integer which maps to a help page. You need to use the Alias feature of HTML Help to map these numbers to pages.

Using mystery numbers in your code is poor programming practice so the correct technique is to create a map header file; a text file which assigns numbers to constant identifiers such as IDD\_MYTOPIC. Then, you can use this

meaningful identifier both in Help Workshop's 'alias' dialogue and in Visual Basic, but only if you assign the HelpContextID in code rather than through the properties window.

The most flexible option is to call the HTMLHelp function directly and there are a number of commands which let you control the help window. HTML help can also send messages back to the application, the WM\_TCARD message, so you can create interactive help. In Visual Basic this requires subclassing or else the use of a message-trapping control.

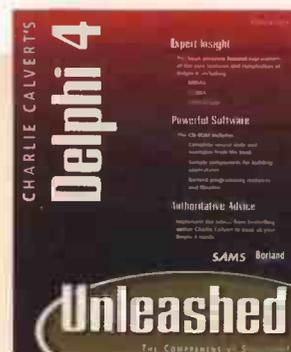
## UNLEASHING DELPHI

Charlie Calvert's book, *Delphi 4 Unleashed*, is knowledgeable and full of common sense for moderate-to-advanced Delphi developers. I would recommend it unreservedly, although I would mention a few caveats.

Firstly, six lengthy chapters are not printed in the book but appear on the CD instead — people do not buy books

in order to read them online.

Secondly, some new features, like dockable controls and Action lists are not adequately covered. Thirdly, around half the content covers internet and distributed applications, including substantial sections on COM and CORBA. If you aren't interested in this aspect of Delphi, the book will be poor value.



But 100 pages on games programming, including DirectDraw and DirectX examples, is a welcome plus. Despite its faults, this is one of the most useful Delphi titles.

**Questions & answers**

**Q** I've tried using Get All Settings to show all the entries for the registry entry: HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\RunServices but I can't get it to work with GetAllSettings.

DAVID MOORE

**a** This is an example of Visual Basic trying to keep things simple and ending with confusion. Rather than

Word's spell checker into a plain text file? What are the copyright issues should I wish to use this text file in my own applications?

HERON BAILEY

**a** It's quite simple, really. Word uses an API called the Common Speller API (CSAPI) which is implemented in MSSP32.DLL. This used to be documented on the MSDN library CD but has been removed. It also appears that the licence agreement with INSO, which supplies the spelling engine and dictionary



**▲ FIG 1** A SIMPLE PAINT APPLICATION CAN BE KNOCKED TOGETHER QUICKLY IN DELPHI

I've used canvas drawing commands to display a form

point is a TPaintBox control on a form. The FloodFill method fills a region with the value of the Brush property — a TBrush object with Color and Style properties. FloodFill also has Color and FillStyle parameters. If FillStyle is fsSurface it fills the area that matches the Color parameter. If FillStyle is fsBorder it fills the area which does not match the Color parameter. A common technique is to get the colour of the pixel under the mouse from the 'Canvas.Pixels' property and use this as a parameter for FloodFill using the fsSurface FillStyle. Fig 2 shows the code. You can use the TColorDialog control to let the user pick a colour for the Brush or Pen.

**[FIG 2] Using FloodFill in Delphi**

```

Procedure TForm1.PaintBox1MouseDown(Sender: TObject; Button:
TMouseButton;
  Shift: TShiftState; X, Y: Integer);
var
  currColor: TColor;
begin
  currColor := PaintBox1.canvas.Pixels[X,Y];
  if rbFill.checked then begin
    PaintBox1.canvas.Brush.Color := clBlue; {or colour of your
  choice}
    PaintBox1.canvas.FloodFill(X,Y,currColor,fsSurface);
  end
  else if rbPaint.checked then begin
    {code for painting goes here}
  end;
end;
(✓ code string continues)
    
```

giving you full access to the registry, the SaveSetting, GetSetting and GetAllSettings functions are designed to let you save and recall settings for your own application. You're not meant to care where the settings are actually stored, which is somewhere in HKEY\_CURRENT\_USER. To read other registry keys use the API registry functions instead. Look at RegEnumValue to read the entries under a particular key.

**Q** Is there a way to 'extract' all the words and phrases from Microsoft

used by Word, prohibits use of the dictionary by third-party applications even if it is already installed on the user's system. Even if you track down the CSAPI there is no function to list all the words in the dictionary. Bad news so far, then. I suggest you search out a public domain dictionary or contact either INSO or another tools vendor for a licence — probably the latter as INSO licences seem expensive.

**Q** I'm trying to write a Delphi version of one of my old Basic programs.

showing a simple picture. I now want to be able to click the mouse on an area of the drawing and fill that area with a colour.

SIMON WARREN

**a** Implementing a simple paint application in Delphi is easy thanks to the TCanvas object. Fig 1 shows an example which uses very few lines of code. The starting

**PCW CONTACTS**

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 Doc-to-Help Professional is £S81.63 (£495 ex VAT) from QBS 0181 956 8000, [www.qbss.co.uk](http://www.qbss.co.uk)  
 HTML Help Workshop download from [www.microsoft.com/workshop/author/htmlhelp](http://www.microsoft.com/workshop/author/htmlhelp)  
 Books available from Computer Manuals 0121 706 6000, [www.computer-manuals.co.uk](http://www.computer-manuals.co.uk):  
 Official HTML Help Authoring Kit by Steve Wexler (Microsoft Press, ISBN 1-57231-603-9, £37.49 book and CD)  
 Delphi 4 Unleashed by Charlie Calvert (SAMS, ISBN 0-672-31285-9, £46.95 book and CD)



## First class post

Use the power of the net to run your own **email server**, in-house. Bob Walder shows the way.

**T**hese days, few organisations are without some form of email communication, whether they operate their own mail server or rely on an Internet Service Provider (ISP). Some are still using email purely as an internal messaging medium while the vast majority have recognised the power of the internet to act as a global transport mechanism for their inter-company electronic mail.

I receive numerous queries each month regarding the subject of email. The two main questions seem to be, 'what sort of mail server should I choose?' and 'how do I connect it to the internet?'. Over the next couple of months, I am going to try to answer both questions.

**The main acronyms** to get to grips with when it comes to email services are POP3 (Post Office Protocol) and SMTP (Simple Mail Transfer Protocol). In simple terms, POP3 provides an individual mailbox for each user, all of which are usually hosted on an SMTP mail server at your ISP.

Mail clients such as Outlook Express allow you to retrieve mail from POP3 mailboxes on an SMTP server. IMAP (Internet Mail Access Protocol) is similar to POP3 in that it allows end users to retrieve mail from individual mailboxes. It provides more facilities for remote users, though, such as the ability to process headers without retrieving the entire message, and so on.

An SMTP server is always required somewhere along the line since this is how the internet ships its mail around: from client to SMTP server and between SMTP servers whenever necessary.

The normal scenario is that mail for your account (or domain) is forwarded to a specific SMTP mail server at your

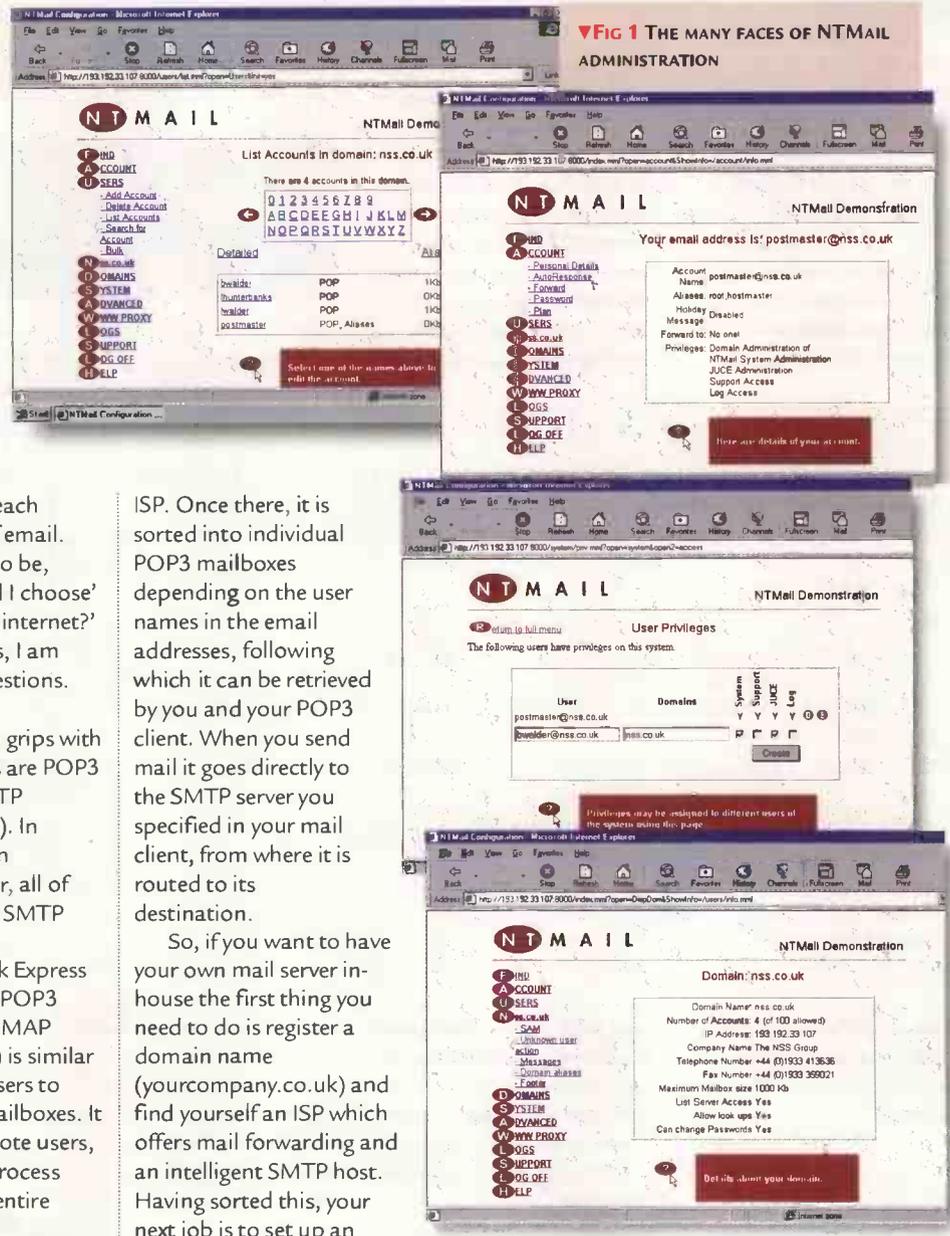
ISP. Once there, it is sorted into individual POP3 mailboxes depending on the user names in the email addresses, following which it can be retrieved by you and your POP3 client. When you send mail it goes directly to the SMTP server you specified in your mail client, from where it is routed to its destination.

So, if you want to have your own mail server in-house the first thing you need to do is register a domain name (yourcompany.co.uk) and find yourself an ISP which offers mail forwarding and an intelligent SMTP host. Having sorted this, your next job is to set up an SMTP host at your end to talk to it.

In other words, you no longer want your Information Service Provider to sort mail into mailboxes for you.

Instead, you want *all* the mail for your domain to be forwarded *en masse* to your own SMTP mail server in-house. In effect, you become an ISP for your internal users. There are several ways to go about this.

### What sort of mail server should I choose?



**NTMail is one inexpensive option** designed to drag mail from your ISP's SMTP host and hold it on your server until someone with a POP3 mail client connects to inspect their mailbox.

NTMail was written from the ground up as a Windows NT package and was not ported from an older 16-bit Windows or Unix application. This means that it is designed to integrate completely with the NT Operating

System and can thus take advantage of OS features such as multi-threading and multiple processors to provide excellent performance.

**NTMail operates** as a number of native NT services: one for the Configuration Server and another for each of the other types of service supported such as POP, IMAP, LIST, POST and SMTP. It also integrates closely with NT in its use of the Performance Monitor and also in terms of user security where the native Windows NT system database may be employed with or without NTMail's own user database.

Administrators can use the familiar NT Performance Monitor to keep track of critical stats such as the number of messages per second, how many messages are queued, number of posts to lists and so on.

Installation is straightforward. With version 4, all maintenance operations can be performed via a simple web browser-based interface. This is provided by the Configuration Server which runs on a different port from any existing web servers allowing it to coexist happily with IIS, Netscape Commerce Server and the like.

**A series of simple forms** allows users to be added and removed, mail to be read, domains to be added and configured, and so on. In addition, specific users can be granted the right to administer particular domains.

Multiple domain support is one of the neat features of NTMail, since it is far simpler to implement than some of its rivals and each domain appears to the outside world as a completely separate system, even though they all reside on the same physical box.

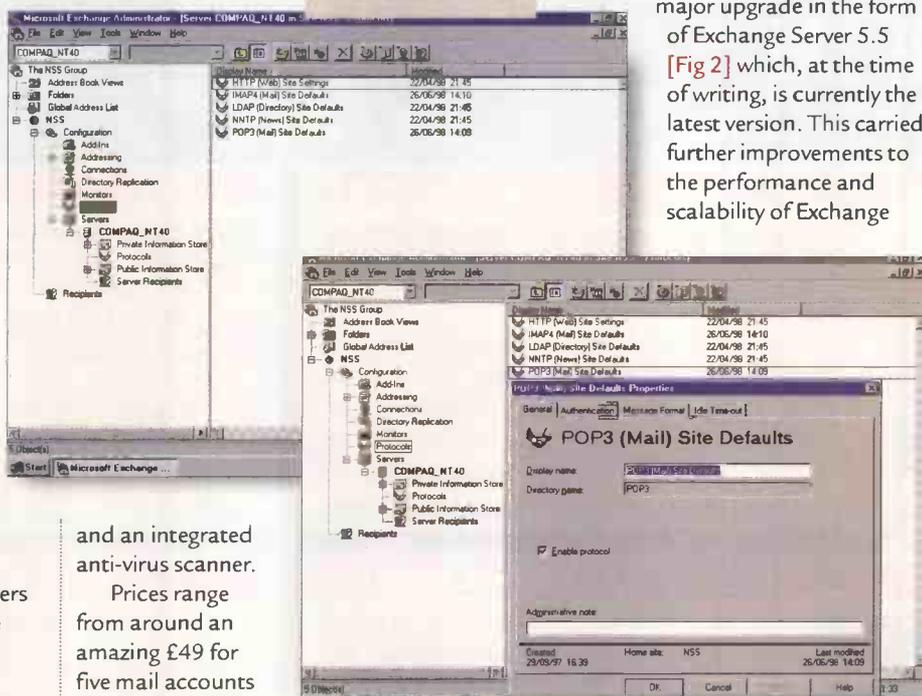
As you would expect, NTMail complies with the relevant internet standards including POP3, IMAP4 and MIME (Multipurpose Internet Mail Extensions). Wherever possible, non-compliant email is made compliant by NTMail so that other servers have no problems processing it. Clearly, there is a huge range of clients that will work with NTMail.

There are two major types of log within NTMail; activity, and the email itself. It will log each inbound or outbound message as it passes through

the server, recording the message itself, the time, its origin and destination. All logs 'roll over' at the end of each day, making it easy to trace what happened and when.

Other useful features include a simple web proxy, Auto Responders, which returns a standard response when someone sends an email to them, and 'robots' which will accept and process all email for a single domain. Optional extras include the JUCE anti-spam filter

**▼ FIG 2 THOSE INTERNET PROTOCOLS, IN SUPPORT OF EXCHANGE SERVER 5.5**



and an integrated anti-virus scanner.

Prices range from around an amazing £49 for five mail accounts — ideal for small offices — to about £895 for 250 accounts, or £2,395 for the unlimited version (see the *PCW Contacts* box, below).

**Microsoft's Exchange Server** is another option, for those with more advanced messaging needs — and bigger budgets! This has undergone several major revisions since its release at the beginning of 1996.

Version 5.0, released in early 1997, was a significant upgrade. Chief amongst the new features was the boosting of internet support. POP3 support appeared, allowing Exchange to host a multitude of internet mail clients not restricted to Microsoft's own. News support (NNTP) was also introduced, allowing Exchange to serve as a true NNTP host for corporate NNTP clients as well as communicate with other internet-

based NNTP hosts to replicate newsgroups.

LDAP (Lightweight Directory Access Protocol) and web integration were other significant additions which allowed remote web-based clients to access the Exchange directory and their mailboxes over the net using a standard browser. And, the Outlook client was upgraded to Outlook 97 and shipped with Exchange Server as the preferred client for both internet and corporate mail.

Less than a year later, at the back end of 1997, we saw yet another

major upgrade in the form of Exchange Server 5.5 [Fig 2] which, at the time of writing, is currently the latest version. This carried further improvements to the performance and scalability of Exchange

Server, increasing backup performance and removing the limit on the size of the message store. Once again, there were additions to internet support with the inclusion of a Chat Service, LDAP3 and IMAP4, further expanding internet functionality and the provision of support for a wider variety of clients.

➔ **Next month**, I will look in more detail at how to persuade Exchange Server to pick up and distribute your internet mail, and how to access your mail via the web using a standard browser.

**PCW CONTACTS**

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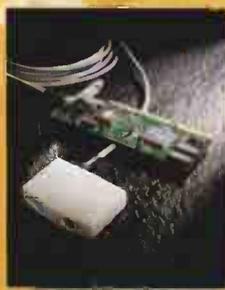
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work with most PowerMac models including current versions that use PCI slots and first-generation NuBus PowerMacs. However, some Performas and PowerBook models can't run it. Old Macs based on the 68000 processors won't run MkLinux either, although there is a version called m68k Linux which is designed for these machines.

There is also a version called LinuxPPC, which is specifically designed to run on PowerMac models using the PCI architecture. LinuxPPC claims to be about 20 percent faster than MkLinux, and to offer greater compatibility with peripherals such as Jaz and Zip drives, although its emphasis on PCI machines means that there are a lot of older Macs which can't run LinuxPPC.

**LinuxPPC** is developed by a separate organisation called LinuxPPC Inc. Even though Linux is free, companies such as LinuxPPC Inc function as businesses by developing, distributing and providing technical support for Linux. The PC equivalent is a company called Red Hat, which is well-known for its work in developing Red Hat Linux for Intel PCs.

You don't have to pay for either version of Linux, though and you can download MkLinux from Apple's web site free of charge. If your Mac will run LinuxPPC you can download the Lite version from the LinuxPPC site, or order the full CD-ROM version for \$32.

**Like BeOS**, Linux allows you to set up a dual-boot system that enables you to select either the Mac OS or Linux when you first turn on your machine. This allows you to continue to work with your existing Mac software and then switch over to Linux when you want to use programs like web servers.

MkLinux and LinuxPPC are 'binary compatible' which simply means that software designed for one version of Linux will work with the other.

**Netatalk is one of the most popular** pieces of Linux software on the Mac. It is the Linux equivalent of Apple's own AppleTalk file server software. There is also a program called Samba which allows you to use Windows PCs as

### **A Mac emulation program called SheepShaver will allow you to run Mac software under Linux**

clients. In addition to these networking programs there are traditional business applications from companies such as WordPerfect and Corel, eager no doubt to grab one section of the market which is not dominated by Microsoft.

**A Mac emulation program** called SheepShaver is also in development which will allow you to run existing Mac software under Linux. SheepShaver is still in the early stages of

development, though, so don't hold your breath waiting for it. In some ways, Linux has greater potential for success than BeOS. It already has around eight million users and a steady stream of software becoming available for it.

The only problem for Mac users is that Linux still shows its Unix roots. It's really only suitable for heavy-duty techies at the moment. Installation is a bit of a nightmare and involves partitioning your hard disk, so be very careful to backup any important files before you start.

## MAC-TO-PC CONVERSION

**I**n the January column, I had a look at some of the options for Mac users who wanted to run PC software on their Macs. Since then I've had some enquiries from readers who wanted to do things the other way around. That is, running the Mac OS or reading Mac-formatted disks on a PC.

Well, as far as running the Mac OS is concerned, forget it. The Mac OS is written specifically for the Motorola PowerPC chips which Apple uses in its PowerMac machines. It may be technically possible to produce a version that

would run on Intel processors but it would take an awful lot of work. And, Apple wants people to run the Mac OS on Mac hardware because that's how it makes most of its money.

However, PCs can read Mac-formatted disks without too much trouble. All you need is a file-translation utility such as Conversions Plus. This is produced by DataViz, the same company which produces the PC file-translation software that Apple bundles with the Mac OS, and it works just as well on the PC as it does on the Mac.

**Conversions Plus** works with Windows 95, 98 and Windows NT 4.0 and costs around £50. A new program called MacDrive 98 has just been released as well. This not only reads Mac disks but it can also decompress files which use Mac compression formats such as MacBinary and BinHex.

UK distribution details were not available at the time of writing but you should be able to gather more information on MacDrive 98 from the developers, Media4, through the internet.

• For more information, see our PCW Contacts box, below.

If you're new to Linux, then LinuxPPC Lite is a good place to start as it has a graphical interface which attempts to hide some of the complexities of Unix from the user. LinuxPPC Inc is also preparing an upgraded version called LinuxPPC Release 5 which claims to be easier to install. It even says that there will be an option for installing LinuxPPC onto the iMac. If the company can pull that off then Linux really could take off on the Mac in a big way.

### PCW CONTACTS

Cliff Joseph can be contacted via the PCW editorial office (address, p14) or email [mac@pcw.co.uk](mailto:mac@pcw.co.uk)

Be Inc [www.be.com](http://www.be.com)

Data Viz [www.dataviz.com](http://www.dataviz.com). Principal Distribution (UK distributor) 01756-704000

FAQ-O-Matic [www.dartmouth.edu/~john/lppc-cache/1.html](http://www.dartmouth.edu/~john/lppc-cache/1.html) for more information on Linux.

LinuxPPC can be download or ordered from [www.linuxppc.org](http://www.linuxppc.org)

Media4 [www.media4.com](http://www.media4.com)

MkLinux free download from [www.mklinux.apple.com](http://www.mklinux.apple.com)

# BESTSELLERS.



18.-24.03.1999, hall 12, booth A64



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July 1998 issue



June 1998 issue



July 1998 issue



Sept 1998 issue



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Sample Gallery  
All Scanners



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4830-Pro Scan



A3 model Scan

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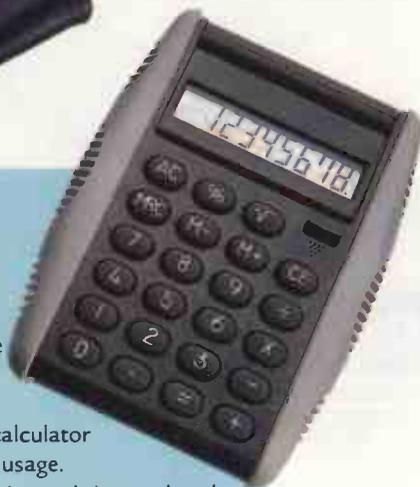
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## Inside Relational Databases

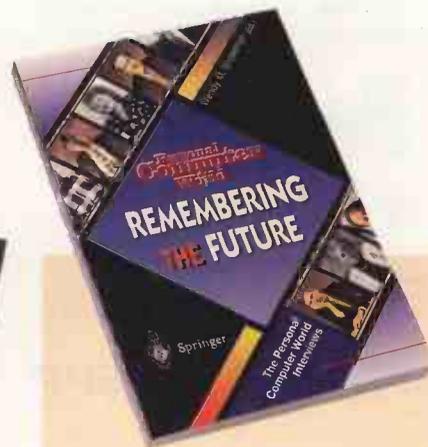
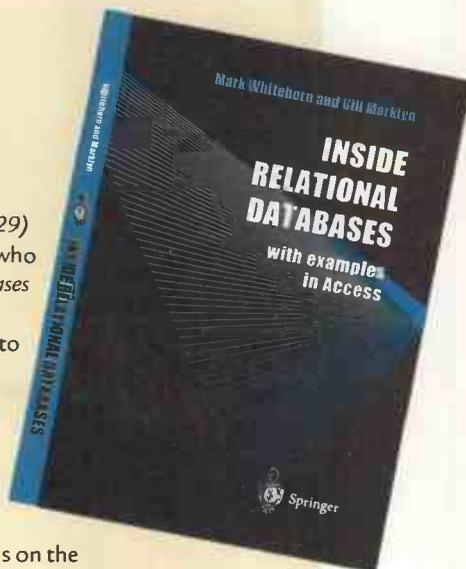
(reviewed in PCW November 97, p329)

- Written by Mark Whitehorn, who writes PCW's *Hands On Databases* column.
- Explains everything you need to know to create efficient relational databases.
- Avoids the usual database jargon.
- Includes masses of examples using Microsoft Access.
- Source code for all examples is on the accompanying CD.
- Reader offer price is just £14.50 — a saving of £5 on the RRP of £19.50.

**Reader offer price** £14.50 (inc P&P)

**Subscriber price** £13.05

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## Remembering The Future

- Collected interviews from *Personal Computer World*, including Bill Gates, Michael Dell of Dell Computers, and Intel's Andy Grove.
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**Reader offer price** £9.95 (inc P&P)

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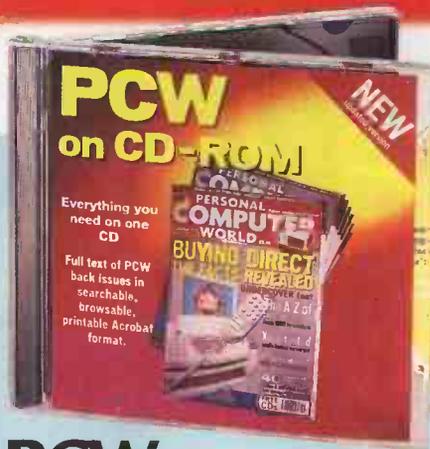
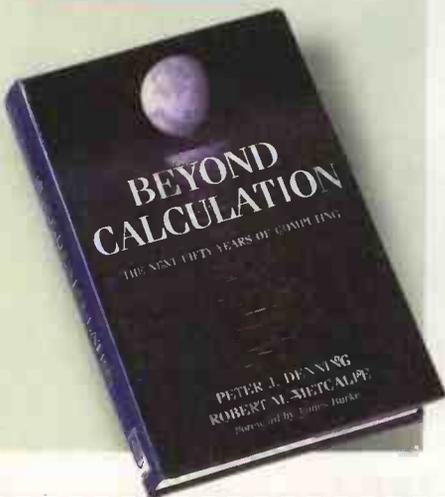
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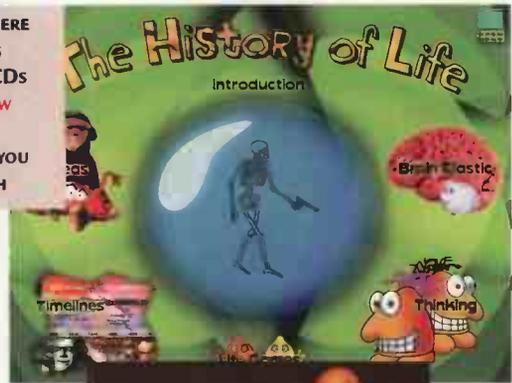
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# leisure lines

**T**he games market has recently been flooded with superb offerings, and you won't be disappointed with any of the reviews in this month's *Screenplay* — they really are a selection of the very best. We have **HALF-LIFE**, **GRIM FANDANGO**, *Settlers III*, *Gangsters — Organised Crime*, *Populous: The Beginning*, and **STAR WARS: ROGUE SQUADRON**. If you think you may need a helping hand with your GCSE English exams this summer, take a look at our comparison of revision titles in the *CD-ROMs* section.

**RIGHT SEE WHERE WE'RE COMING FROM IN THE CDS SECTION BELOW MIND YOUR LANGUAGE AS YOU LEARN ENGLISH**



**▲ KNIGHT FANTASTIC: FIND THE MISSING FIGHTERS IN CASTLE, THE LATEST KIDS' STUFF FROM FISHER PRICE**

Other reviews include IBM's new World Book and a CD taking you through the **HISTORY OF LIFE**. Titles in the *Kids* section are **CASTLE** from the new **FISHER PRICE** range, and Dorling Kindersley's *The NEW Way Things Work*. Learn about The History of Modern Computing in the *Books* section. Other titles reviewed are *Competing on Internet Time* and **INTERNET BASICS IN NO TIME**. If you love dance music and a free internet account sounds good, then the *Competition* page will be right up your street. The London nightclub **MINISTRY OF SOUND** has

loads of goodies up for grabs, including subscriptions to its magazine, a copy of the new album, and T-shirts. MathSoft too is giving away software, especially for GCSE and A-Level students: forty copies of *StudyWorks* **MATHS AND SCIENCE**. A £20 book token is up for grabs in the **BRAINTEASERS** section, and you could be the lucky winner of a new Chambers dictionary if you complete our *Prize Crossword*. And finally, alas, poor Oric: in *Retro*, Simon Collin reminds us of the rise and fall of the **ORIC-1**.

**▼ THE MAN (AND WOMAN) FROM THE MINISTRY: COOL PRIZES TO BE WON IN THIS TOTALLY SOUND COMPETITION**



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ETELKA CLARK, LEISURE LINES EDITOR [etelka\\_clark@vnu.co.uk](mailto:etelka_clark@vnu.co.uk)

# Populous: The Beginning

What a good graphics card is for: **conquering your enemy's undulating territory.**

**T**his game makes you grateful for the fact that you lashed out an extra fifty quid on a snazzy graphics card. Previous games from Bullfrog have been pretty impressive on the graphics front, but this one is truly superb. The graphics and sound serve to create a very evocative atmosphere. Bullfrog has introduced a fully rotatable 3D world into this game, which you can zoom in and out of to see undulating territory over which you must take control. As a Shaman, it is your job to collect manna and develop powers that will enable you to conquer territories controlled by your enemies.

Populous: The Beginning starts off with a simple scenario that enables you to learn the basics of the game. As you



progress to different worlds,

new challenges are presented which bring the opportunity to use some of the more exciting features. As time goes on you will progress from training your braves as warriors and priests, to attacking the enemy via balloon and unleashing demons that swoop down and eat enemy tribe members alive.

Significantly, the scenarios in Populous: The Beginning are noticeably more difficult than those in Dungeon Keeper, a game I quickly grew bored

with. I spent seven or eight games trying to solve some of the puzzles in the new game, which made it a more enjoyable challenge.

This game's audio-visual superiority makes it an ideal way of showing your beefy PC off to your mates. Otherwise, it's just a jolly good way to spend a Sunday afternoon.

DANNY BRADBURY

## PCW DETAILS



Price £34.99

Contact Bullfrog 01753 546465  
[www.bullfrog.co.uk](http://www.bullfrog.co.uk)

System Specification Windows 95/98, Pentium 133, 16Mb free RAM, 100Mb free hard-disk space, 4X CD-ROM drive.

# Grim Fandango

**Grimly fiendish fun** based on ancient folklore.

**S**et in the land of the dead and based on Aztec folklore, in this game you are Manny Calavera, a skeletal figure armed with a scythe. Your job is to sell travel packages to help people in their four-year journey to the Ninth Underworld. Those who have been especially good qualify for a trip on the Number 9, a train that takes only four minutes to cross this land. When all of the good clients start going to Manny's rival, Domino, and when the people who qualify for a trip on the Number 9 don't get one, it's up to you find out what's



going on. Control is via keyboard or joystick action: the mouse is not an option.

Lucas Arts has created another winner here, a game that not only looks good but also has a truly brilliant plot. There are a couple of glitches, though.

Running into things turns Manny in a completely different direction, occasionally leading to him running onto the wrong screen. And when he passes objects of interest, he tilts his

head towards them, which can make it hard for you to line up with the object that you want to use. Grim Fandango is a real joy to play despite these niggles, however, and the tricky puzzles will keep you amused for hours. If you're an adventure-game fan, it's too good to miss out on.

DAVID LUDLOW

## PCW DETAILS



Price £40

Contact Activision 01895 456700  
[www.lucasarts.com](http://www.lucasarts.com)

System Specification Windows 95/98, Pentium 133, 4X CD-ROM drive, 23Mb RAM, DirectX. (DirectX 6.0 is on the CD and must be installed before play.)



# Half-Life

No half measures here as **nightmare creatures** threaten to destroy your world.

**Y**ou are a Research Associate in Theoretical Physics at the Black Mesa Research Facility. An experiment involving the construction of a space/time portal goes awry, allowing various unknown life forms to leak through with catastrophic and truly horrific results. Adopting a first-person style, your ultimate aim is initially unknown. But through interaction with the various characters, you begin to realise what you must do. Advances on Quake 2's approach are skilfully grafted into the gameplay with scripted sequences occurring whether you're there or not. But your intervention may dramatically alter the outcome of the mission. Your enemies are deviously cunning and adversaries are allowed to evolve, with some even agreeing to team up with you against the monsters. The scenario is well thought out, with expert animation to enhance



the terrifying experience. The depiction of nightmare creatures from another dimension is truly scary.

Just when it all seems to be hopeless, seeping through on your radio headset come transmissions from a platoon of clean-up soldiers. Unfortunately, you and

all the surviving members of the research facilities are on the list of items to be cleaned up.

The beautiful landscapes and realistic motion are coupled with an excellent soundtrack styled to highlight the drama and atmosphere of certain scenes. With a dozen multi-player maps supplied on this CD alone, and further support and updates already in the pipeline, Half-Life may prove to be the new king of internet gaming.

IAN ROBSON

## PCW DETAILS



Price £39.99

Contact Sierra 0118 920 9100

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

**System Specification** Windows 95/98/NT, Pentium 133 or equivalent, 24Mb RAM (32Mb rec.), 2X CD-ROM drive.



# Star Wars: Rogue Squadron 3D

The force is well and truly with you in this **action-packed blast-fest**.

## Short of fighting

**Alongside** Ewan McGregor in the next Star Wars movie or employing the Force during Intel press conferences, my dreams came true when Lucas Arts first developed X-Wing for the PC. Natural evolution now brings us Rogue Squadron, the first of the Star Wars games to properly exploit 3D graphics accelerators.

General Rieekan briefs you on 16 new missions which take place between Star Wars: A New Hope, and The Empire Strikes Back. Luke Skywalker may have just destroyed the Death Star, but the mighty Empire is gathering strength for a determined all-out assault on the rebel forces. To save the Alliance, Luke and Wedge have assembled Rogue Squadron, 12 of the most skilled starfighter pilots in



the Galaxy. You fly A, V, X and Y-Wings along with Airspeeders in dogfights and air-to-ground combat against an enormous range of Imperial forces, including TIE fighters, probe droids and heavily armoured AT-AT walkers.

Gameplay is superb: you can get right into the missions, but serious effort is required to get beyond the first few. Like most Lucas Arts games, the graphics (supporting Direct 3D and Glide), sound

and attention to detail are excellent, although users with ATi 3D Rage Pro accelerators may need to install different drivers — the latest v5.23 drivers won't work.

If you ignore the Star Wars tie-in, Rogue Squadron is a fairly average PC 3D shoot-em-up. However, fans like me will absolutely love it and relish the most realistic opportunity yet to experience the Star Wars universe.

GORDON 'RED LEADER' LAING

## PCW DETAILS



Price £39.95

Contact Activision 01895 456700

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

**System Specification** Windows 95/98, P166, 32Mb RAM, DirectX 6.0, 3D Accelerator, 2X CD-ROM drive. Supports Direct 3D and Glide.



# Settlers III

Isn't it time you settled down and **built your own economy?**

**S**ettlers, the third of a series, allows you to take control of a small group of shipwrecked people with enough wood, stone, tools and labour to start up a small colony. Your aim is to capture raw materials from the surrounding landscape and transform them from their natural lumpy state into something useful, like tools or weapons.

Essentially you have to build a thriving economy-in-miniature, including mines, saw mills, farms and bakeries, to make sure that everyone is fed, happy, and producing as much as possible.

The aim of Settlers III is to fully colonise the island your people have landed on. By building military structures and filling them with soldiers, you can expand your borders into the unknown.



At some point, though, you will end up hitting a

wall of opposition in the form of a rival race. This will require conquering before you can fully achieve your goal.

Gameplay is exactly the same as in

## PCW DETAILS

★★★★

Price £35

Contact Blue Byte 01604 232200  
[www.bluebyte.com](http://www.bluebyte.com)

System Specification Windows 95,  
Pentium 100MHz processor, 32Mb RAM,  
200Mb free hard-disk space.

the previous two releases, except you no longer need to connect your community with roads: your settlers are free to roam as they please. Beyond that, the graphics have changed and the obligatory internet multi-player option has been put in place.

Anyone who has never played the previous games but likes the idea of creating micro-economies for fun, will get a kick out of this. Gamers who have played any of the other titles in

the series might be a little disappointed that despite the refinements, the game remains the same.

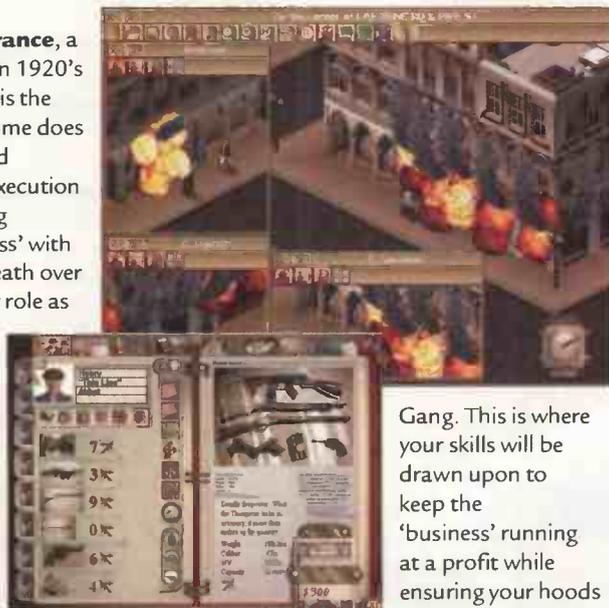
ANDY SHAW

# Gangsters - Organised Crime

**Gang warfare** of a heavy kind as you make your mark with the mob.

**S**et in New Temperance, a Chicago-like town in 1920's prohibition, Gangsters is the strategy game where crime does pay. From extortion and intimidation to street execution and all-out bloody gang warfare, you are 'da boss' with the power of life and death over those you control. Your role as a new mobster is to become the city's crime overlord above three rival Gang Leaders. Each one starts off in a different quarter of the city and has the task of eliminating the competition.

The Gang Organiser is the strategy planning interface that attempts to recreate a world of gangland mobsters where you organise your teams, view city information and give orders to your



Gang. This is where your skills will be drawn upon to keep the 'business' running at a profit while ensuring your hoods are well looked after.

The Working Week is where you see the results of the orders, look for new targets and take immediate action against any intruders. Combining real-time action in a highly detailed isometric terrain, you

can watch eagle-eyed as your hoods terrorise the city for your gain.

With four fully interactive tutorials gently introducing you to the different aspects of this game, it can take a dedicated wannabe Godfather to wade confidently into the underworld. But the rewards are worthy of your efforts, with a highly inventive strategy approach and consuming animation drawing you further into the believable scenarios. With over 5,000 individual characters, Gangsters will provide hours of expert training.

IAN ROBSON

## PCW DETAILS

★★★★★

Price £39.99

Contact Eidos  
Interactive 0181 636 3000  
[www.eidosinteractive.com](http://www.eidosinteractive.com)

System Specification Windows 95/98,  
Pentium 133, 16Mb RAM, 2Mb SVGA  
video card, 200Mb free hard-disk space,  
4X CD-ROM, DirectX 6.0 compatible  
sound card. DirectX 6.0 included on CD.



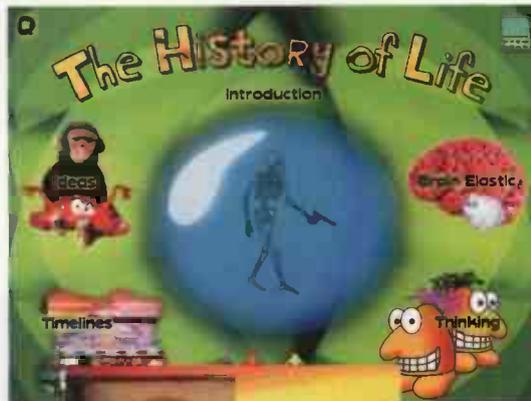
# History of Life

Life on earth in pictures, music and animation.

**H**istory of Life is the sequel to the successful History of the Universe title from the same publisher. Targeted at an audience between 10 and 14 years old, it has a distinctive style and content.

As befitting a multimedia title, this CD is packed with pictures, music, sound effects and animations. But it isn't all song and dance. History of Life has some exceptionally well written pieces dealing with the various aspects of life on earth. You can begin the tour by studying the various theories about evolution: the piece on Charles Darwin goes into some detail aided by slide shows and animations.

**Narration is mainly through** an audio commentary with very few subtitles, but



this is not a problem as all of the topics are dealt with carefully and are not

rushed. There is a collection of quotes by famous scientists and philosophers, some of which, in the light of modern knowledge, are quite amusing.

The CD contains a Brain Elastic section with brainteasers. Some of the questions, like 'What is the point of sex?', may prove a bit too strenuous for youngsters. Still, the section is worth perusing. There are also two timelines, a quiz section and three games.

This multimedia CD is not a definitive guide. But after the contents have been exhausted, users can log on to related web sites and go through the material there. Altogether, well worth a try.

AJITH RAM

## PCW DETAILS



Price £19.99

Contact Ransom Publishing  
01491 613711

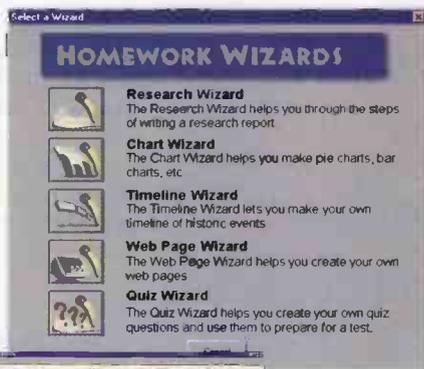
[www.ransompublishing.co.uk](http://www.ransompublishing.co.uk)

**System Specification** Windows 3.1 or higher, 486 DX, 8Mb RAM, 2X CD-ROM, Windows-compatible sound card and speakers.

# IBM World Book 1999

Well, it's a pretty small US-centric world, if this **disappointing CD** is any guide.

**C**ontaining every article from the 22-volume World Book Encyclopaedia, this production promised a lot. The paper version is, after all, the biggest-selling print encyclopaedia in the world. I was a little disappointed with the uninspiring interface which had neither the appeal of Encarta nor the style of Britannica. I also found the lack of captions on street plans confusing and counter-productive. This is not always a problem if linking to a plan from an associated article, but if it's the result of a random selection from the 'Just Looking' section of the CD, then you can find yourself



somewhat lost. Hyper-linking is poor: double-clicking a word in an article links to the dictionary rather than related articles.

This may not sound like a problem, but when I was looking at Lodz, Poland's second largest city, and clicked Warsaw, we linked not to an article about the capital city but to the dictionary definition of warsaw (sic) — 'a large grouper of the south-eastern coast of the United States'.

We reviewed the International Deluxe English Edition, which included not only the content of the original World Book

but also a virtual tour of San Diego, homework wizards and a collection of tools designed to help students compile charts, timelines and reports.

**From experience** of past issues of the World Book CD-ROM, I did have high hopes for this 1999 version, but I was disappointed. A valiant attempt, but it failed to live up to Encarta.

NIK RAWLINSON

## PCW DETAILS



Price £49.99 (£29.99 for Standard Edition)

Contact IBM 0800 214887  
[www.worldbook.com](http://www.worldbook.com)

**System Specification** Windows 98/95/NT4 or higher, 486/66 or higher, 16Mb RAM, 39Mb hard-disk space, 16-bit sound card, 16-bit colour recommended, 2X CD-ROM drive. For online access you'll also need an additional 8Mb free hard-disk space, a modem and an internet connection.

# Software for GCSE English 99: a comparison

Testing times are ahead for students of the written word: will these **revision aids** help?

**E**xam time is nearing and the pressure will soon be on. You're either a student feeling like you haven't learnt a single thing in five years, biting your nails to the quick and wondering how you're going to pull it off, or you're a parent on your knees every night, praying that your son or daughter will scrape through. Well, help is at hand. Here we have rounded up three of the latest software packages to help you work towards the grade you want in GCSE English.

## Anglia Multimedia: The Essential Companion to GCSE English 98-99

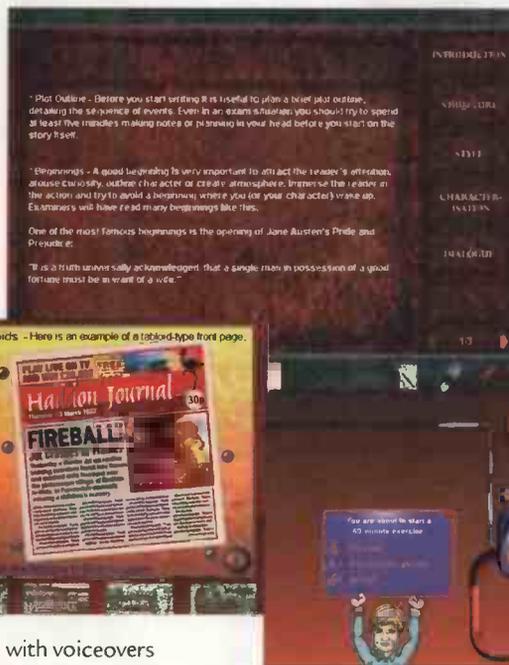
This CD starts off by presenting an animated bedroom as a contents interface. Here you can run the cursor over objects that will present you with a topic. Main features include sections where you can assess yourself and obtain tips for revision and for taking the exam, a To Do list that you can personalise to create your own revision schedule, examiners' views on passed exams, links to related web sites and mock exams.

In the Tutorial section you can brush up on your reading, writing, spelling, punctuation and grammar. The writing tuition is especially good as it helps students develop their structure, style, characterisation and dialogue.

This program does not benefit from background music or a voiceover for guidance. It feels impersonal, and would be impractical for students with bad eyesight and who rely on sound to study. Also, all sections, apart from the contents interface at the beginning, looked and felt dull and uninspiring — not what you need when you're trying to study.

## Europress: GCSE English

The whole feel of this software is colourful, bright and lively. You are able to set the difficulty level to one you are comfortable with, and like the other titles it includes sections that aim to help you improve your reading, grammar, punctuation, spelling and writing, but



LEFT ANGLIA MULTIMEDIA'S ESSENTIAL GUIDE TO GCSE ENGLISH LEFT, BELOW EUROPRESS GCSE ENGLISH BELOW GSP'S REVISE FOR GCSE ENGLISH

similar. The user chooses a topic — for example, imaginative writing. Instead of then being introduced to the many types of writing in this category and the importance each one may have, you are given brief guidelines on how to write a story, and a choice of essay titles, then Sarah pops up with a board saying 'You have 30 minutes to

complete this task'. How dull. You may as well be at school. Overall, a very limited piece of software.

ETELKA CLARK

## PCW DETAILS

★★★★

**The Essential Companion to GCSE English**

Price £45

Contact Anglia Multimedia  
01603 615151 [www.anglia.co.uk](http://www.anglia.co.uk)

System Specification Windows 3.1 or later, IBM 486 DX/66MHz, SoundBlaster-compatible sound card.

★★★★★

**GCSE English**

Price £19.99

Contact Europress 01625 855000  
[www.europress.co.uk](http://www.europress.co.uk)

System Specification Windows 95 or 98, PC 486 DX-66MHz, 8Mb RAM, Windows-compatible sound card.

★★★

**Revise for GCSE English**

Price £19.95

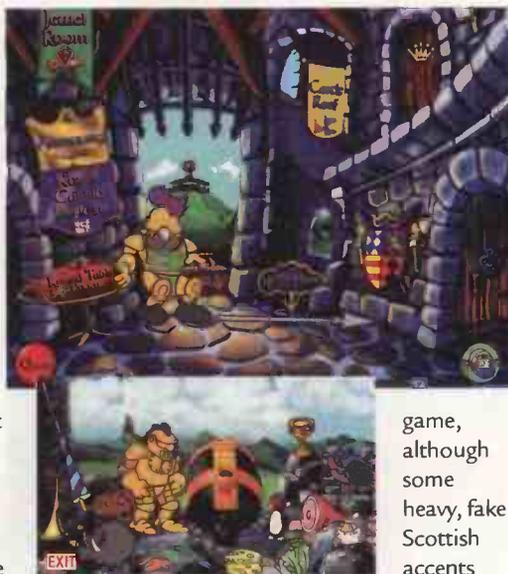
Contact GSP Software 01480 496575  
[www.gspltd.co.uk](http://www.gspltd.co.uk)

System Specification Windows 3.1 or 95, IBM-compatible PC, 486/66MHz processor, 8Mb RAM, 16-bit sound card.

# Fisher Price Adventures: Castle

Activities and games galore as you **search the castle** for six missing knights.

**P**art of the Fisher Price **Great Adventures** series, this is an animated collection of puzzles and games that uses the popular QuickTime engine, making it colourful and fast as well as fun. It is best described as a virtual activity centre, with its different rooms and gadgets. The point is to rescue six knights hidden in the castle's many chambers, but along the way there are puzzles to work out and some very good games. There are areas for your child to be creative, such as designing a coat of arms, building a castle and creating a comic book. These areas use a palette of pre-drawn parts that the child can drag and drop on to a canvas, and the finished product can be printed out. Guides are on hand to talk the child through the various parts of the



game, although some heavy, fake Scottish accents might cause comprehension problems for the youngster. In addition, the mouse pointer used to navigate around the castle and pick up objects is hard to see if you are running the game at a high resolution.

**Parents will have fun** assisting children, although Dad should resist the urge to take over when playing Shoot The Castle. One feature I liked was the gratuitously funny King's Cannon section, which has no educational value whatsoever but allows you to fire a variety of objects from a large gun. Try the penguin, the chicken and, my favourite, the cheese.

BARRY DE LA ROSA

## PCW DETAILS

★★★★

Price £14.99

Contact Cendant Software  
0118 920 9100

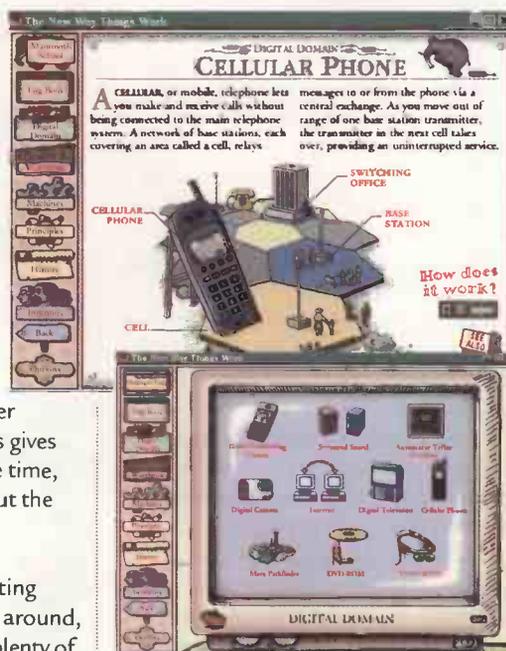
**System Specification** IBM PC compatible, 486/66MHz or faster processor, 6Mb free hard-disk space, 4X CD-ROM drive, SoundBlaster-compatible sound card, 256-colour, 640x480 display.

# The NEW Way Things Work

The development of **human technological achievement**, presented in a friendly fashion.

**T**his CD-ROM marks the tenth anniversary of the original book on which this program is based. This updated edition presents more animations, gadgets and gizmos explaining and demonstrating the history and workings of 21st century technology. Stretching back to Antiquity, and up to our Silicon Age, the development and progress the human race boasts can be mapped by the user through the History section. This gives examples of the inventions of the time, and provides brief synopses about the principles of how they work.

**The user interface** is an interesting landscape for the user to wander around, with clear links throughout and plenty of references to other related subjects. Cartoon sketches and small animations bring to life the words and explanations for each subject and item that is covered. With the personal log book, the user is



able to gauge where they have been and what sites are left to visit. Additionally, personal progress can be measured by participation in the brainteasers on offer in the Mammoth School House, where

the user's knowledge acquired from this CD-ROM is put to the test. Mammoth Movies add a nice touch, giving animated snippets of information. However, they end abruptly and leave you wondering, without direction, which movie you should watch next in order to further the explanation.

The New Way Things Work is a nice but unspectacular production. It's a fairly good resource for children aged eight upwards to learn about the principles and history of technologies, and the inventors behind them.

HELEN FORTGANG

## PCW DETAILS

★★★★

Price £29.99

Contact Dorling Kindersley  
0171 753 3488

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

**System Specification** PC: 486 DX/33MHz+, minimum 8Mb RAM, 8-bit sound card, 256-colour at 640x480 pixels (16-bit recommended), 2X CD-ROM.

### Rules of entry

These competitions are open to readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications, Ministry of Sound and MathSoft. The Editor of *Personal Computer World* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of competition prizes.

### How to enter the MoS competition

To enter the MoS competition, just call 0870 909 8200 and order a free starter pack, and tell the operator that you are entering the PCW competition.

### How to enter the MathSoft competition

1. Via our web site at [www.pcw.co.uk](http://www.pcw.co.uk), or
2. Write your name, address and daytime telephone number on a postcard or on the back of a sealed envelope. Mark your card 'PCW/MathSoft Competition' and send it to: P.O. Box 191, Woking, Surrey GU21 1FT, to arrive by Friday 26th March 1999.

• Please state clearly on your competition entry if you do not wish to receive promotional material from other companies.

## Win a Ministry of Sound internet account!

The famous London-based nightclub, **Ministry of Sound**, has launched its own ISP internet connectivity service, [ministryofsound.net](http://ministryofsound.net), and an internet content subscription service within its existing web site [ministryofsound.co.uk](http://ministryofsound.co.uk).

Aimed at existing online dance music enthusiasts, [ministryofsound.net](http://ministryofsound.net) will provide subscribers with traditional internet access facilities such as free technical support, 20Mb of free web space and access to a VIP area of the enhanced [ministryofsound.co.uk](http://ministryofsound.co.uk) web site.

The VIP area of the site contains exclusive premium material including competitions, daily news, and Live Real Audio streaming mixes from the world's greatest DJ talent. The existing web site includes daily editorial covering dance music, club fashion, music technology, travel, and lifestyle issues. Ministry of Sound has simultaneously launched a **Digital Record Label** allowing

amateur dance music enthusiasts to publish their music on the internet and so bring it to the attention of the professional music industry A & R executives.

The subscription fee for three months' connection to [ministryofsound.net](http://ministryofsound.net) is £12.50 (ex VAT) and £10 (ex VAT) each month thereafter.

♦ **Five PCW readers** can each win a free internet account for a year, plus a year's subscription to *Ministry* magazine, a copy of the new album, *Clubbers Guide to Ninety Nine*, and a Ministry of Sound T-shirt.



## Win a copy of MathSoft StudyWorks!

Exam time is fast approaching and GCSE and A-Level students must be quaking in their boots at the thought of the ordeal ahead. But for anyone preparing to take maths and science exams, **MathSoft International** has come to the rescue. The company is giving 40 PCW readers the chance to win a copy of the latest version of its popular **StudyWorks** series, worth £24.95 each.

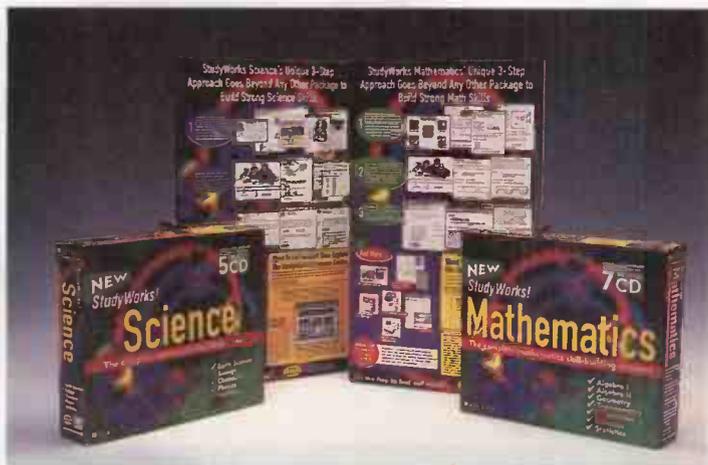
The series comprises **StudyWorks Mathematics and Science** titles. Both are ideal study aids for students taking GCSE or A-Level exams, as they contain a wealth of information.

Unlike competing products, the geographical examples used in StudyWorks are interactive, so students can input their own figures into sums or equations. This way, they can develop a fuller understanding of the topic. Students also benefit

from the facility to design graphs, pie charts and other graphical representations that help to support their work.

♦ **Forty PCW readers** have a chance to win a copy of StudyWorks Mathematics and Science in this great competition.

➔ For details of how to enter these competitions, see the panels on the left of this page.



# Video in Video out

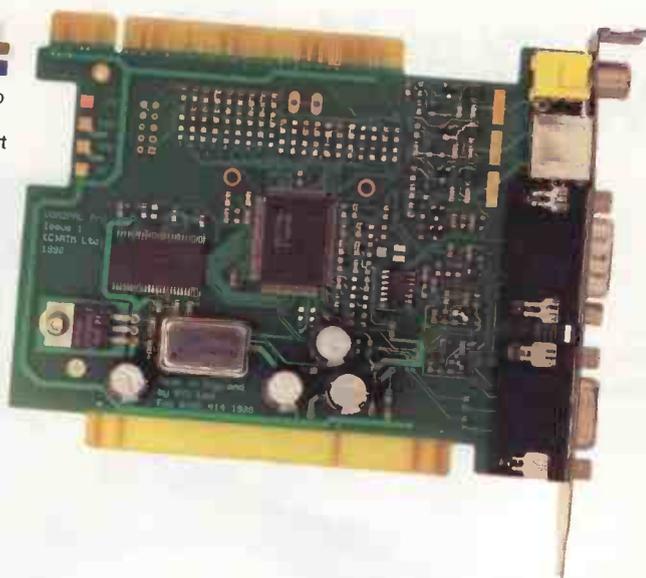


## MovieStar★

MovieStar allows you to capture video and is bundled with MGI VideoWave SE+ which allows you to edit and title your movie. It accepts composite video as well as Svideo signals. Windows 95 & 98 compatible with plug and play driver. £69+VAT.

## VGA2PAL PRO

VGA-2-PAL Pro is the new top of the range PAL converter. It boasts the capability to convert any screen mode from 640x350 to 1024x768 into 50Hz PAL which is VCR compatible. It requires no software drivers and really does just plug in and go. £69+VAT.



For those who want to use the PC for something a little more worthwhile ATM have the MovieStar video capture card and the new VGA-2-PAL Pro video output card.

Both are essential components in connecting your computer to the camcorder, TV and VCR. Used together with the bundled software you can capture edit and output your home movies.

We pioneered still frame capture with the Motion Picture range which in our eyes still holds the title for the best colour stills from video, and now we are giving you the technology to both capture and edit video on the desktop with these two unique components.

We have even developed a new socket for capture cards which allows you to link the capturing of AVI movies to the triggering of industry standard sensors using the optional patch panel & software. So if you want to capture nocturnal wildlife or villainy you can now do it in an altogether more automated way.

Shortly we will have blown away the last data bottle neck on the current PC by developing a video disc array that uses low cost UDMA drives in parallel to multiply storage bandwidth. As with all our products this will be a total solution with an air conditioned carrier for the hard disc drives to improve longevity.

We have a whole range of products and you can get the full data by looking at [www.ndirect.co.uk/atm](http://www.ndirect.co.uk/atm) or if you want something a little more substantial call, write or fax us with your address to receive our printed datasheets on all our ranges.



Model		Price
K5011	<b>MovieStar PCI</b> (Maplin Code PS77)	£69.00
K3012	<b>VGA-2-PAL Pro</b> (Maplin Code UC81)	£69.00

All prices exclude VAT. Carriage in the UK is free. E&OE.



### Send me the full datasheets!

Name

Address



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The Old Chapel, Winlaton Mill, Tyne & Wear, NE21 6RT  
Tel: (0191) 414 5929 Fax: (0191) 414 1939  
e-mail: [enquiries@apptec.demon.co.uk](mailto:enquiries@apptec.demon.co.uk) web-site: [www.ndirect.co.uk/atm](http://www.ndirect.co.uk/atm)



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ATM, The Old Chapel, Winlaton Mill, Tyne & Wear, NE21 6RT

# Tangerine dream

The Oric-1 tasted the **fruits of success** but, as Simon Collin remembers, the rot soon set in.

**B**ack in the early eighties, the computer industry trifled briefly with fruit. Apricots and Apples are well known and documented, but was there ever a pear or banana? Unlikely. There was a Tangerine however, and this company provided the core of a brash, low-cost home computer that arrived, with much advertising and unlikely backing from British Car Auctions, in 1983.

**Tangerine was heavily involved** with the Prestel online information service and designed the Microtan range of computers. These designs were part of the Tandata offshoot of Tangerine that was sold off to make way for a software company, Tansoft (the glimmer of a family name might begin to be apparent). Tangerine continued to work on hardware designs and soon came up with a Prestel-capable computer that also provided its own computing power; other Prestel units were often rather dumb display terminals.

To move these designs into production, Tangerine set up the Oric company and worked towards producing a home computer that was Prestel-capable, cheap, powerful and business-friendly. The Oric-1 was born. Oric had plenty of time to watch the mistakes of the other major players in the home computer market. The company could have noted the supply and quality control problems that dogged early Sinclair Spectrums and the BBC Micros. Unfortunately, Oric did not.

## *Oric had plenty of time to watch the mistakes of the other major players...*

The Oric-1 was launched at a grand party in early 1983. The computer was roughly the size of a Sinclair Spectrum, had a clicky keyboard with rather small keys and was priced aggressively at £129 for a basic 16Kb model. This unit had a 6502 processor running at 1MHz with up to 48Kb of RAM as standard or 64Kb via a clever bit of bank-switching control software. The Oric-1 had teletext-style



▲ **ONE TO WATCH: THE ORIC-1 COULD HAVE BEEN A GREAT HOME COMPUTER, BUT ITS SUCCESS TURNED SOUR**

colour graphics functions built-in with 240x228 pixel resolution. To provide audio effects, three channels of sound were available together with a BBC-style white-noise generator that buzzed and hummed unless, as a real techno-music guru, you knew how to control it.

**Initial sales** of the Oric-1 were very impressive, with first orders of 30,000 units from individuals hoping for delivery by Christmas. Details of high-street stores taking up to 200,000 units were printed and the Oric-1 seemed on a fast-lane to success. Unlike the competition, the Oric-1 was also a success outside the UK — notably in France, where good distribution ensured excellent sales. What could go wrong? Unfortunately, supplies of the ROM chips were delayed and deadlines slipped.

Not a great start after all. Budding programmers could get their hands dirty with a built-in version of Basic, but as there was no real resident editor, correcting mistakes was a pain. If you wanted to load a game or business software, the only initial was a cassette-port socket. This cassette port was fitted as a short-term solution with promises of a real, high-capacity disk drive unit very soon. The disk drive never arrived and the cassettes were often hard to load, a fault later blamed on the tape duplicators rather than the hardware.

The result was thousands of cassettes being

returned to Oric from the high-street stores that stocked the computer.

As well as the disk drive, Oric also promised a modem, moving the computer towards the more serious, business end of the market. Neither of these appeared. Instead, there was a flurry of games, assemblers and expansion boxes.

**After a couple of years**, the company received a fresh injection of capital and produced the Atmos computer. This included an updated ROM, better keyboard and yet more promised add-on products. This time, the micro-disk drives did appear, after a certain delay. And from this point on, the Oric history turns into an epic. A rival company with a similar name started in France; both promised bigger, better Oric computers. No computers were launched; legal fights started and then the receivers moved in.

The Oric-1 sold well but was not a qualified British success. The company had time to study the problems and pitfalls of the competition, had a reasonable product with a few unique features and, if it had delivered all it promised, would have produced a great home computer that could have been the start of a great range. □

# books

## Internet Basics in No Time

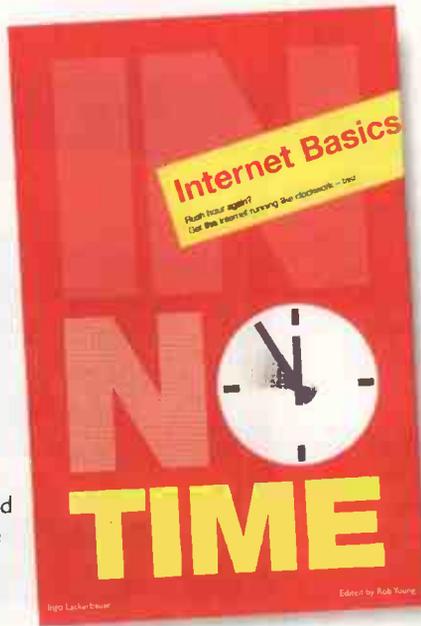
**W**ith the internet being the huge growth area and buzzword that it is, more and more people are signing up to use it. But for the uninitiated, this can be a daunting and difficult task: how the internet works, and how you can learn to get the most from it, can leave you floundering. Into this vacuum comes Ingo Lackerbauer, with this book written in plain English.

**He starts off** with a brief history of the internet and a quick overview of the principles that make it a reality. This lucid and non-patronising section quickly

brings the reader up to speed on how the internet is made up. It also has some much needed information on relatively obscure topics such

as the meaning of IP addresses.

**With those basics** out of the way, the book moves on to focus on its main point — connecting to and using the internet. From this point on, the author has had to make some basic choices as to which software the reader will be using. Lackerbauer has decided to stick with Windows 95/98 and Internet Explorer. While these choices take the Microsoft approach, it is really the



most efficient way to provide the required help. He then proceeds to explain the chosen program in a systematic fashion. These lessons are assisted by detailed screenshots of the programs. In this way, you can compare the results you see on your screen to those in the book. You move from simply connecting to the internet, to browsing, downloading files via FTP, and installing video viewers.

**Should you be an internet novice** but are keen to learn, then you could do a lot worse than starting off with this book which covers the most important aspects of the world wide web in sufficient detail.

DAVID LUDLOW

### PCW DETAILS



**INTERNET BASICS  
IN NO TIME**

**Author** Ingo Lackerbauer

**Publisher** Prentice Hall  
Europe

**ISBN** 0-13-977661-3

**Price** £12.99

## A History of Computing

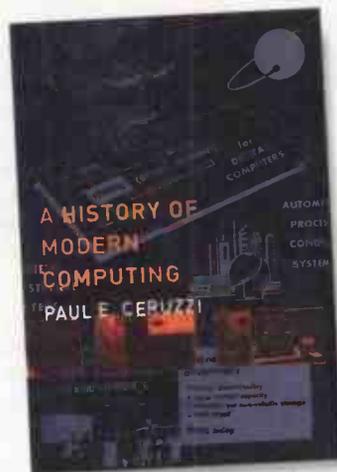
**S**panning nearly fifty years, this new history of modern computing is a minutely detailed, engaging and insightful overview of the development of modern computing from the mid 1940s to the mid 1990s. Covering all the major events from their inception to the advent of the internet, Paul E. Ceruzzi has written an authoritative guide that will stand as a landmark.

**Beginning with** the ENIAC, the first machine truly deserving the title 'computer', through the work of John von Neumann and on to a treasure-trove

of machines that span the decades to the mid seventies when the personal computer became a reality, Ceruzzi at no time

allows himself to be overwhelmed by the information he is handling. He deftly recounts technical development, but tempers this with a discussion of the human contribution to computing history. Much of this has already passed into folklore. Each decade is analysed, and the machines, personalities and organisations described in detail, but detail that never becomes stale. The part played by IBM, DEC, Hewlett-Packard, Unisys and Texas Instruments, now household names, but then, new companies finding their feet in a new market, is covered in depth.

Much of the historical timeline is a



fascinating read. Acronyms come to life and fit into the overall picture of the computer's development. Once the age of the personal computer is reached, beginning with the Altair, the story becomes more familiar. Ceruzzi packs in the detail, providing a breadth of information that infuses the story with some excitement as each new development is explained. Names such as the TRS-80, Apple II and Commodore PET all come under the spotlight, and are put in their rightful place in the historical evolution of digital computers.

This is an highly readable and information-rich history of the development of the modern computer, but a history that doesn't forget the human contribution to this industry.

DAVID HOWELL

### PCW DETAILS



**A HISTORY OF MODERN  
COMPUTING**

**Author** Paul E. Ceruzzi

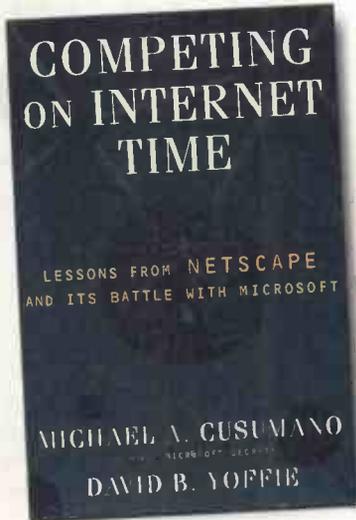
**Publisher** The MIT Press

**ISBN** 0-262-03255-4

**Price** £24.95

# Competing on Internet Time

Netscape started its astonishing growth in 1994. In a short space of time, it became the world's fastest growing software company, completely dominating the web browser market. Then along came Microsoft to spoil Netscape's party. *Competing on Internet Time* takes a look at this battle in great detail. Rather than just making the book a simple profile of Netscape, the authors have aimed for something



tactics used — agile and ever-changing. The fact that the bulk of the book is based on interviews with Netscape staff, gives us a great insight into how Netscape works internally. Split into sections, starting from how the company was created, down to how both Netscape and Microsoft used various strategies to gain market

## PCW DETAILS



### COMPETING ON INTERNET TIME

Authors *Michael A. Cusumano and David B. Yoffie*

Publisher *Simon Schuster*  
ISBN *0-684-85319-1*  
Price *£18.99*

rather more substantial. They have used the conflict to let us learn more about the decisions that both Netscape and Microsoft made. They name the 'Judo'

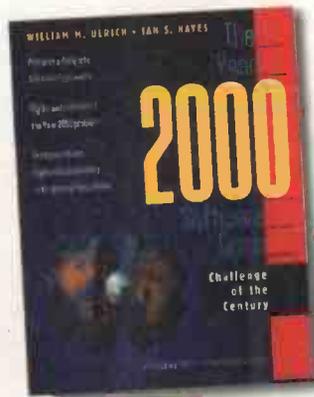
share, it's an involving read: every business could learn something here. Even minor details like the hiring policies of the two companies are analysed.

**There are some** important business lessons to be learnt from this book. But even if you are really just interested in the whole Netscape vs Microsoft issue, you should still find much to appreciate.

DAVID LUDLOW

# The Year 2000 Software Crisis: Challenge of the Century

Aimed at those people who need an in-depth description of the issues involved in the millennium bug, namely IT professionals, this book provides guidance for implementing the various solutions. It starts



problem is, then presents an overview of the various strategies to be adopted. *Challenge of the Century* serves as a guide to the steps you should take; from identifying those systems that are affected, to controlling the changeover process. There is even a section on how to choose the correct tools for the job. As a guide to solving the problem of the Y2K bug, this

off with a couple of well written chapters explaining what the

book does serve very well. Unfortunately, the affected firms have less than a year left to solve the problem. For those that are severely affected, this book may have arrived a little too late.

DAVID LUDLOW

## PCW DETAILS



### THE YEAR 2000 SOFTWARE CRISIS: CHALLENGE OF THE CENTURY

Authors *William M. Ulrich, Ian S. Hayes*

Publisher *Prentice Hall*  
ISBN *0-13-655664-7*  
Price *£29.95*

TOP

10

books

1

**The Internet: The Rough Guide 1999**  
Rough Guides  
£5.00

2

**Effective COM**  
Addison-Wesley  
£29.99

3

**Unified Modelling Language User Guide**  
Addison-Wesley  
£35.99

4

**VB & VBA in a Nutshell**  
O'Reilly  
£14.95

5

**Perl Cookbook**  
O'Reilly  
£29.50

6

**MCSE: The Core Exams in a Nutshell**  
O'Reilly  
£14.95

7

**Java Servlet Programming**  
O'Reilly  
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**Flash 3 Creative Web Administration**  
Macromedia Press  
£22.99

9

**UML in a Nutshell**  
O'Reilly  
£14.95

10

**Little iMac Book**  
Peachpit Press  
£13.99

Prices include VAT on disks and CD-ROMs. List supplied by The PC Bookshop, 21 Sicilian Avenue, London WC1A 2QH. Telephone: 0171 831 0022 Fax: 0171 831 0443

# brainteasers

## Quickie

What is the greatest number of 1 inch cubes that can be placed in an empty box 4 inches wide, 4 inches deep and 4 inches long? By the way, the answer is NOT 64.

## This Month's Prize Puzzle

This month's problem will test your ability to manipulate data, rather than test your mathematical prowess.

Among the tools of my trade, I have three important files:

- A file of prime numbers
- A file of palindromic numbers
- A file of exact powers of numbers

I combined these files, removed duplicate entries, all values with more than 6 digits, and sorted the rest to give one sequential file.

What value, on this sequential file, is the one where the sum of all values before it is most nearly equal to the sum of all values after it?

Send your answer on a postcard or the back of a sealed envelope, to: PCW Prize Puzzle - April 1999, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20th April 1999.

We will also accept solutions by email. Send the solution only (no explanatory notes or program listings etc.) to [jj.clessa@btinternet.com](mailto:jj.clessa@btinternet.com).

## Winner of January 1999 Prize Puzzle

The annual crossword puzzle obviously appeals to many of you, and as usual attracted a flood of entries — well over 300. The winning entry, chosen at random from the pile, came from Mrs F

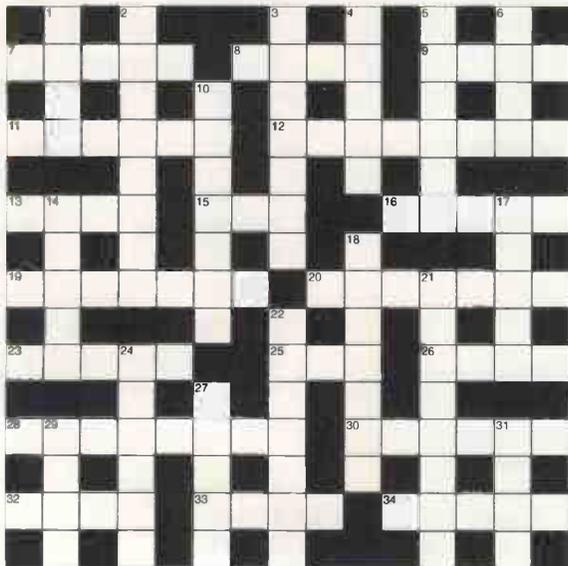
	3	8	4	5	1	5	5	7	
2	7	8	6	4	1	1	1		6
1	7		5	4	0	1	8	1	5
5	4	2	7	3	9		6	8	9
5	0	9	1		3	2	8	9	6
	1	8	5	1		9	1	8	1
4	8	0		9	1	7	1	3	6
8	3	9	2	6	5	0		1	6
2		7	5	0	1	9	9	8	5
	3	2	8	3	2	1	1	8	

Littlewood of Kippax in West Yorkshire. Congratulations, Mrs Littlewood, your prize will be with you shortly.

Meanwhile, to the also-rans, keep trying, it could be your turn next.

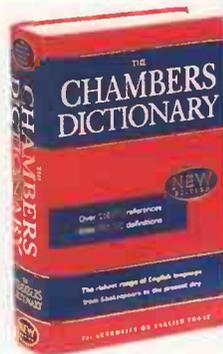
JJ CLESSA

# prize crossword



Each month, one lucky PCW crossword entrant wins a copy of the new Chambers Dictionary. This time, it could be you. Send your completed crossword to 'PCW April Prize Crossword', VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive not later than 26th March, 1999.

Please state clearly on your entry if you do not wish to receive promotional material from other companies.



THESE ARE THE SOLUTIONS FOR THE MARCH '99 PRIZE CROSSWORD PUZZLE.

ACROSS  
7 Serial port 8 File 9 Imported 10 Sector  
11 Attach 13 Volumes 15 Decrypt  
17 Hot link 19 Buffers 21 Report 24 Dialog  
26 Transfer 28 Word 29 Error codes  
DOWN  
1 Permeate 2 Dig out 3 Plot 4 Moody  
5 Otis 6 Alcove 8 Factual 12 Caper 14  
Ozone 16 Ruffled 18 Nattered 20 Unison  
22 On show 23 Storm 25 Glee 27 Airs

## ACROSS

- 7 Computer's sound capability (5)
- 8 Tiny information parcels (4)
- 9 Command to look through code (4)
- 11 Net archive search program (6)
- 12 Digital protection against external peril (8)
- 13 Free and incomplete software version (4)
- 15 Net addressing system (abbrev) (3)
- 16 Ones' code accompaniment (5)
- 19 The 'U' of 15 across (7)
- 20 Booted up (7)
- 23 Packets of saved data (5)
- 25 Common extension (abbrev) (3)
- 26 Unwanted Net communication (4)
- 28 Accepted rules for Net communication (8)

- 30 Server in charge of others (6)
- 32 Net language (inits) (4)
- 33 Classic operating system (4)
- 34 Error signals (5)

## DOWN

- 1 Cat's contented sound (4)
- 2 Repel (5, 3)
- 3 Drawback, danger (7)
- 4 Oust (5)
- 5 Idly surf (6)
- 6 Bucket (4)
- 10 Need (7)
- 14 Boredom (5)
- 17 Musical drama (5)
- 18 Small rivers (7)
- 21 Opposed (8)
- 22 Hold forth, speak (7)
- 24 Praises (6)
- 27 Rugby formation (5)
- 29 Speed (4)
- 31 Catch sight of (4)

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**WINNER**  
dantium /200MMX  
Best Pro PC  
June 97



**WINNER**  
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Gold Award  
June 97



**Service & Reliability**  
User Survey  
August 1997



**PC Zone Classic**  
dan Home Plus/200  
PC Zone Classic  
September 97



**Editors Choice**  
dan Xplora Plus/166  
Editor's Choice  
September 97



**Best Buy**  
dan Home Plus/233  
Best Buy  
October 97



**Value**  
dan Ultimate/200XE  
Value  
November 97



**Editors Choice**  
dantium II/26  
Editor's Choice  
January 98

# Thank you to everyone

We're proud of the numerous accolades we win for Dan Technology PCs month after month. And nothing gives us more pleasure than being up there amongst the winners of the magazines annual awards. Sometimes our votes come from expert journalists. With PC Direct, PCW, PC Pro and What PC?, recognition comes from the readers themselves. But wherever they come from, we're very grateful for these tributes to the efforts of our workforce. Thank You.



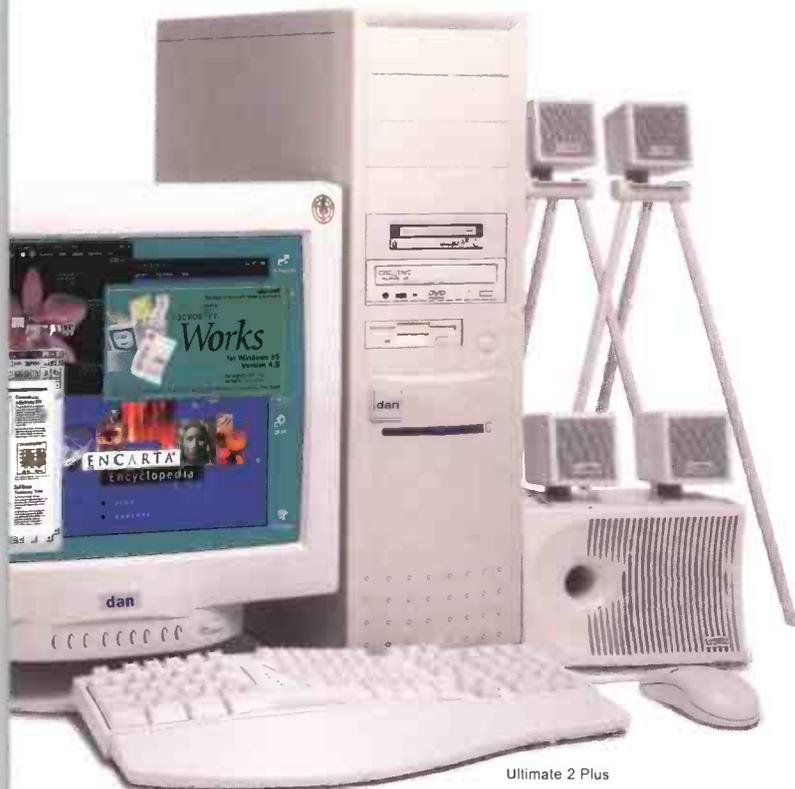
**Best Service Award**  
**Best Support Award**  
PC Pro Reliability & Service Awards 1998  
**WINNER: Dan Technology**



**Best PC Manufacturer**  
**Best After-sales Service**  
What PC? Readers' Awards 1998  
**WINNER: Dan Technology**



**Best Service & Reliability: Desktop PCs**  
PCW Service & Reliability Survey 1998  
**WINNER: Dan Technology**



Ultimate 2 Plus

## Ultimate 2 Plus

with Dual Pentium®II Processor capability



- 128MB PC100 SDRAM
  - 10GB EIDE or 9GB WIDE SCSI HDD
  - Choice of Intel **Celeron** or **Pentium®II Processor** (single or dual) with Cache Memory
  - ATI Xpert'98 8MB AGP Video Card
  - 19" SVGA L/R N/I Monitor (Viewable size 18" - 450mm)
  - 56K V90 Voice\*Fax Modem (UK only)
  - Iomega 2GB JAZ Drive (SCSI) + cart.
  - 5x speed DVD Drive (not with Windows NT)
  - Soundblaster Live! Value OEM
  - PCWorks FourPointSurround Speakers
  - Full Tower Case with PSU
  - 1.44MB Floppy Disk Drive
  - Dual Port SCSI Controller (Ultra & Wide)
  - 1 Parallel, 2 Serial and 2 USB Ports
  - Microsoft Elite Natural Keyboard
  - Microsoft Intellimouse, Microphone
  - Windows 98 or 95 (please specify)
  - Microsoft Works Suite 99, Encarta 99 US Encyclopaedia, Serif Page Plus & MMX™ Software Bundle (5 titles)
  - 1st Year On-Site Maintenance
- \* Additional speakers or headphones are required at additional cost

### 10GB EIDE HDD – Single CPU

CELERON 400	£ 1843	£ 2166	incl. VAT
PENTIUM II 400	£ 1942	£ 2282	incl. VAT
PENTIUM II 450	£ 2098	£ 2466	incl. VAT

### 9GB Wide SCSI HDD – Single CPU

CELERON 400	£ 2042	£ 2400	incl. VAT
PENTIUM II 400	£ 2141	£ 2516	incl. VAT
PENTIUM II 450	£ 2297	£ 2699	incl. VAT

Dual processor capability is only available on systems with Windows NT installed

### 10GB EIDE HDD – Dual CPU

PENTIUM II 400	£ 2173	£ 2554	incl. VAT
PENTIUM II 450	£ 2485	£ 2920	incl. VAT

### 9GB Wide SCSI HDD – Dual CPU

PENTIUM II 400	£ 2372	£ 2788	incl. VAT
PENTIUM II 450	£ 2684	£ 3154	incl. VAT

Call for details of Intel Pentium III processors

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Xplora Plus K6/233  
Best Buys of '98  
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dantium II 300/GS  
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dan Ultimate +2DG  
Editor's Choice  
May 98



dantium II/333WSD  
Expert Buy  
May 98



Educational Systems  
Winner  
June 98



dantium II/W5  
Editor's Choice  
July 98



dan Ultimate 350/98  
Value  
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dan Ultimate II/BX  
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November 98



dan Ultimate II/450HS  
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November 98

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**Best Educational Systems  
Best Network Servers**  
PC Direct Hits Awards 1998  
**WINNER: Dan Technology**



**Most Reliable PC Manufacturer**  
PCW Annual Readers' Awards 1998  
**WINNER: Dan Technology**



"For the first time one vendor won in every category, making it the most consistently reliable service and support organisation we've ever seen. With a string of wins behind it from previous years, Dan remains the place to go for computers that work."



"Quite apart from top marks for consistency, Dan is clearly doing something right. It's not a huge international organisation, but its service, reliability and support are clearly world class. Earlier arguments that it couldn't realistically be compared with the US giants no longer seem to hold water."  
PC Magazine, August '98

## Ultimate 2

with Pentium®II Processor

- Choice of Intel Celeron® or Pentium®II Processor with Cache
- 128MB PC100 SDRAM
- 8.0GB Hard Disk Drive
- ATI 8MB Xpert'98 AGP Video Card
- 17" Iiyama L/R N/I Monitor (A701GT) (Viewable size 16.2"-405mm)
- 1omega 100MB ZIP Drive + cart.
- 32MAX Speed EIDE CD-ROM
- SoundBlaster Live! Value OEM
- Hi-Fi Power Speakers (150W PMPO)
- 56K V90 Voice\*Fax Modem (UK only)
- Midi Tower Case with PSU
- 1 Parallel, 2 Serial and 2 USB Ports
- 1.44MB Floppy Disk Drive
- Windows UK Keyboard
- Microsoft Intellimouse, Microphone
- Windows 98 or 95 (please specify)
- MS Works Suite 99, Serif Page Plus, Encarta 99 US & MMX™ Software
- 1 Year On-site Maintenance

CELERON 400	£ 1270	£ 1493 incl. VAT
PENTIUM II 400	£ 1369	£ 1609 incl. VAT
PENTIUM II 450	£ 1525	£ 1792 incl. VAT

\*additional speakers or headphones are required at extra cost.

## Popular upgrades for Dan systems

### Video Card Upgrades **NEW**

Upgrade from ATI Xpert'98 8MB to

	<b>ATI Rage 128 32MB AGP</b>	£ 76 (€ 90)
	<b>ATI Xpert128 16MB AGP</b>	£ 49 (€ 58)
	<b>TNT Riva 16MB AGP</b>	£ 52 (€ 62)

### ATI All in Wonder Pro

For the ultimate in multimedia graphics and video capabilities in a single card, look no further than the All in Wonder Pro from ATI. Based on ATI's latest 3D Rage Pro processor, the All in Wonder Pro offers just about the most comprehensive solution there is for industry-leading 2D acceleration, arcade-quality 3D acceleration, video capture, output to TV and TV Teletext functions.



**Upgrade to All in Wonder Pro 8MB**  
from ATI Xpert'98 8MB £ 48 (€ 57)

### Creative Sound Blaster Live!

Upgrade to the Sound Blaster Live! Full Edition and experience sounds rather than just hear them! With all the features of the Sound Blaster Live!



Value OEM (surround-sound Environmental Audio, 256-voice synthesis, Environmental Audio Extensions) the Live! Full Edition includes fully featured software and a high quality Digital I/O Audio extension card.

**Upgrade to Sound Blaster Live!**  
from SoundBlaster Live! Value £ 71 (€ 84)  
from SoundBlaster PCI64 £ 103 (€ 122)

**Upgrade to PCWorks FourPoint Surround Speakers**  
from Hi-Fi Power Speakers £ 29 (€ 35)

### Desktop Video Camera

This superb desktop camera uses a 1/4" Colour CCD for use in video conferencing, video capture & still image applications.

**Desktop Video Camera** £ 71 (€ 84)

### Yamaha CRW4416s Rewriter

A cost effective 3-in-1 drive, the CRW4416s CD Rewritable can write/overwrite CD-RW and CD-R discs at 4x speed, and read both formats, together with standard CD discs at 16max speed. (SCSI controller required - sold separately.)



**Yamaha CRW4416s** £244 (€287)

### TEAC CD-R55S CD Writer

The perfect solution for archiving and distributing large amounts of information, the TEAC CD-R55S can write over 600MB of data (74 minutes of audio) to a single CD with performance speeds of 4x write/12x read. (SCSI controller required - sold separately.)

**TEAC CD-R55S** £186 (€219)

### HP CD Writer Plus 8100i

**HP CD Writer Plus 8100i** £272 (€320)

Opening Hours - London/Leeds Showrooms: Mon-Fri 9.30am - 6pm

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# networking

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AMD® K6-2 Processor Based System

- 32MB PC100 SDRAM
- Choice of Hard Disk Drive
- AMD K6-2 Processor
- 512KB Pipeline Burst Cache Memory
- ATI 4MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed EIDE CD-ROM
- Fast EIDE PCI HDD Controller
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- 1 Parallel & 2 Fast Serial Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows 98 or 95 (please specify)
- MS Works 4.5

AMD Processor	AMD K6-2
4.0GB	£ 576
6.4GB	£ 590
8.0GB	£ 607

Intel Express Pro 100 UTP Network Card £ 40

## dantum 2

Celeron/Pentium® II Processor Based System

- 32MB PC100 SDRAM
- Choice of Hard Disk Drive
- Choice of Intel® Celeron or Pentium® II Processor with Cache
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed EIDE CD-ROM
- Fast EIDE PCI HDD Controller
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows 98 or 95 (please specify)
- MS Works 4.5

Intel Processor	CELERON 333	CELERON 400	PENTIUM II 400
4.0GB	£ 583	£ 652	£ 755
6.4GB	£ 597	£ 666	£ 769
8.0GB	£ 614	£ 683	£ 786
4.1GB SCSI	£ 910	£ 979	£ 1082
9.0GB SCSI	£ 1006	£ 1075	£ 1178

450MHz Pentium II upgrade from 400 £ 162

## dantum 2 WS

Dual Pentium® II Processor capability

- 128MB PC100 SDRAM
- Choice of Hard Disk Drive
- Choice of Intel® Celeron or Pentium® II Processor (single or dual) with Cache
- Iomega 100MB ZIP Drive + cartridge
- Matrox 16MB Millennium G200 Video Card
- 19" Super VGA L/R N/I Monitor (Viewable size 18"-450mm)
- 56K V90 Voice\*FaxModem (UK only)
- 32MAX Speed EIDE CD-ROM
- Dual Port SCSI Controller
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- MS IntelliMouse™, Windows UK Keyboard
- Windows NT Workstation
- MS Works 4.5

\*additional speakers or headphones required at extra cost.

Single Processor	CELERON 400	PENTIUM II 400	PENTIUM II 450
10GB UDMA EIDE	£ 1497	£ 1600	£ 1762
9.0GB WIDE SCSI	£ 1704	£ 1807	£ 1969
18GB WIDE SCSI	£ 2038	£ 2141	£ 2303

As above with 2 CPUs installed as standard

Dual Processor	CELERON 400	PENTIUM II 400	PENTIUM II 450
10GB UDMA EIDE	£ N/A	£ 1840	£ 2164
9.0GB WIDE SCSI	£ N/A	£ 2047	£ 2371
18GB WIDE SCSI	£ N/A	£ 2381	£ 2705

**Delivery** cost to mainland UK for one system is £19.

**Windows NT 4 Workstation upgrade... £ 77**  
Call for low cost upgrade to Office 97 & Office 97 Pro

## Network Workstations



All Dan PCs can be used as workstations by adding a network card. The most popular card is the 16-bit Ethernet Novell NE2000 compatible. However, the Intel Express Pro PCI card can give higher performance.

Example of Workstations:

### Entry level Station dantum /W

dantum/K6-2/350	£ 576
16-bit Ethernet card	£ 15
Workstation price	£ 591

### Best Seller Station dantum 2 /W

dantum 2/333	£ 583
Intel Express Pro card	£ 40
Workstation price	£ 623

### Power User Station dantum 2 WS /W

dantum 2 WS/C400	£ 1497
Intel Express Pro card	£ 40
Workstation price	£ 1537



## 6 Years Winner

Annual PC Magazine Service & Reliability Reader Survey

"For the sixth year in a row Dan wins the Overall Satisfaction for Desktop PCs category, making it the most successful vendor in this survey ever. Its achievement is enhanced this year by its taking the overall winner's crown, as well as an equally strong showing in every one of the survey's categories... Quite apart from top marks for consistency, Dan is clearly doing something right. It's not a huge international organisation, but its service, reliability and support are clearly world class... Dan is the company that makes us feel good." PC Magazine, August 1998, Service & Reliability 1998 Reader Survey

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# solutions



All Dan PCs are built with BIOS Complyancy

## dantum 2 Server

Celeron/Pentium® II Processor Based System

- 128MB PC100 SDRAM
- Choice of Ultra DMA HDD from table
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed EIDE CD-ROM
- Intel Express Pro UTP Network Card
- Fast EIDE PCI HDD or Adaptec PCI SCSI Controller
- 1.44MB Floppy Disk Drive
- Full Size Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows 98 or 95 (or NT at extra cost)

Pentium®II Processor	CELERON 400	PENTIUM®II 400	PENTIUM®II 450
4.0Gb	£ 818	£ 921	£ 1083
6.4Gb	£ 832	£ 935	£ 1097
4.1Gb WIDE SCSI	£ 1151	£ 1254	£ 1416
9.0Gb WIDE SCSI	£ 1243	£ 1346	£ 1508

18Gb Wide SCSI HDD from 9Gb Wide £ 334

## dantum 2 Duo Server

DUAL Pentium® II Processor capability

- 128MB PC100 ECC SDRAM
- Choice of Wide SCSI HDD
- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed SCSI CD-ROM
- Intel Express Pro UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- Full Size Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows NT Server (5 user licence)

Single Processor	PENTIUM®II 350	PENTIUM®II 400	PENTIUM®II 450
4.1Gb WIDE SCSI	£ 1883	£ 1960	£ 2122
9.0Gb WIDE SCSI	£ 1975	£ 2052	£ 2214

As above with 2 CPUs installed as standard

Dual Processor	PENTIUM®II 350	PENTIUM®II 400	PENTIUM®II 450
4.1Gb WIDE SCSI	£ 2046	£ 2200	£ 2524
9.0Gb WIDE SCSI	£ 2138	£ 2292	£ 2616

18Gb Wide SCSI HDD from 9Gb Wide £ 334

## dantum 2 RAID Server

DUAL Pentium® II Processor capability

- 128MB PC100 ECC SDRAM
- 18GB SCSI HDD (3x9GB HDDs in RAID 5 config. with HotSwap capability + spare/redundant 9GB HDD worth £346)
- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed SCSI CD-ROM
- Adaptec RAID PCI controller
- Intel Express Pro UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- RAID Server Case with redundant PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows NT Server (5 user licence)

Single Processor	PENTIUM®II 350	PENTIUM®II 400	PENTIUM®II 450
18Gb WIDE SCSI	£3768	£3845	£4007

As above with 2 CPUs installed as standard

Dual Processor	PENTIUM®II 350	PENTIUM®II 400	PENTIUM®II 450
18Gb WIDE SCSI	£3931	£4085	£4409

## dantum 2 XRAID Server

DUAL Pentium® II Xeon™ Processor capability

- 128MB PC100 ECC SDRAM
- 18GB SCSI HDD (3x9GB HDDs in RAID 5 config. with HotSwap capability + spare/redundant 9GB HDD worth £346)
- Choice of single or dual Intel® Pentium®II Xeon™ Processor with choice of Cache Memory
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"-333mm)
- 32MAX Speed SCSI CD-ROM
- Adaptec RAID PCI controller
- Intel Express Pro UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- RAID Server Case with redundant PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows NT Server (5 user licence)

Single Processor	CACHE 512K	CACHE 1MB	CACHE 2MB
XEON 450	£4450	£5427	£6872

As above with 2 CPUs installed as standard

Dual Processor	CACHE 512K	CACHE 1MB	CACHE 2MB
XEON 450	£5146	£7100	£9990

**For Novell Netware File Servers:** you must upgrade the EIDE CD-ROM to SCSI add £ 31 (plus £ 79 for Adaptec AHA 2920 SCSI controller if needed)

Call for information on LVD SCSI Drives

## Network upgrades for Dantum systems

### Network Cards

16-Bit Network Card Ethernet (NE2000 comp. -Thin Ethernet/Twisted Pair)	£ 15
16-Bit Network Card Ethernet (3COM509)	£ 47
32-bit PCI Ethernet Card (3COM900)	£ 51
32-bit PCI 100Mbps base-T Ethernet Card (3COM905)	£ 43
32-bit PCI Intel Express Pro 100UTP Card	£ 40
Intel Express Pro 100UTP Server Card	£ 356

### Network Hubs

8 Port 10 base-T Mini Ethernet Hub	£ 43
16 Port 10 base-T Mini Ethernet Hub	£ 90
Intel stackable 10/100 base 12 Port Hub	£ 558
Intel stackable 10/100 base 24 Port Hub	£ 800

### Uninterruptible Power Supplies - UPS

1000VA UPS Interactive (APC)	£ 324
700VA UPS Interactive (APC)	£ 230

### Tape Streamers for Servers

(Controller & Backup Software not included - figures in brackets denote max. compression rate)	
Seagate TapeStore 8000 SCSI	£ 224
4GB (8GB comp) DAT Streamer+120m tape	£ 487
12GB (24GB comp) DAT Streamer+125m tape	£ 701

### Miscellaneous

15" Colour Monitor from 14" SVGA	£ 20
----------------------------------	------

## 5 Years Winner & Runner-up

Network Server Category, Readers Survey - Direct Hits 1994,'95,'96,'97 &'98

"Yet again we saw the number of Network Servers available through the direct channel rise sharply in '97, with more companies than ever offering servers off the page. Runner-up Dell is just one of the direct manufacturers to seek a portion of this growing market. But the winner is a company that has continued to dominate when it comes to selling servers off the page, winning the Direct Hits Server award year after year, and that's Dan Technology." [Dan has won the Network Server category every year since 1993.]

PC Direct, June 1998, Direct Hits Readers Awards 1998

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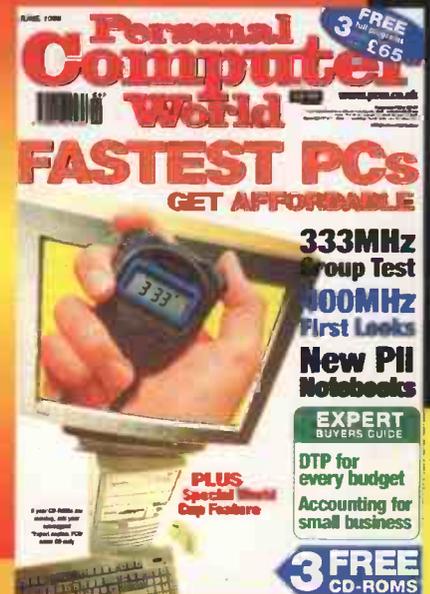
"ADI has grown rapidly since 1979 to become one of the top five monitor manufacturers in the world. When we first introduced ADI monitors to the UK in 1995, it was vital for us to talk direct to a rapidly growing IT market. Personal Computer World was our first choice for launch advertising. Personal Computer World was then as it is today, a market leader with an ever growing circulation, attracting a massive audience of the informed professional readers we wanted to talk to. For us, Personal Computer World delivers the perfect combination where professional users can read about our products in news and reviews, get to know us from our advertisements, and easily buy our products from the leading PC Builders and mail order companies."

"Having won the best monitor award from Personal Computer World for our 17" MicroScan 5G monitor in 1997, we know the fantastic volume of calls and sales that Personal Computer World readers can generate. That is why Personal Computer World is an important partner, helping to build on our success in the UK today, and tomorrow."



Alan Chai  
Managing Director ADI UK

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## Memory

8MB Memory 72-pin Module with Parity	£ 19 ( 23)
16MB Memory 72-pin Module with Parity	£ 37 ( 44)
32MB Memory 72-pin Module with Parity	£ 70 ( 83)
16MB EDO RAM 72-pin Memory Module	£ 26 ( 31)
32MB EDO RAM 72-pin Memory Module	£ 57 ( 67)
64MB EDO RAM 72-pin Memory Module	£ 105 (124)
16MB SDRAM 168-pin Memory Module	£ 17 ( 20)
32MB SDRAM 168-pin Memory Module	£ 33 ( 39)
64MB SDRAM 168-pin Memory Module	£ 65 ( 77)
128MB SDRAM 168-pin Memory Module	£ 130 (153)
32MB PC100 SDRAM 168-pin Memory Module	£ 36 ( 43)
64MB PC100 SDRAM 168-pin Memory Module	£ 71 ( 84)
128MB PC100 SDRAM 168-pin Memory Module	£ 142 (167)

*RAM prices are subject to change. Please call for latest prices.*

## Video Cards

ATI 3D Charger PCI 2MB EDO RAM	£ 16 ( 19)
ATI 3D Charger AGP 2MB EDO RAM	£ 16 ( 19)
ATI 3D Charger AGP 4MB EDO RAM	£ 19 ( 23)
ATI Xpert'98 AGP 8MB SDRAM	£ 26 ( 31)
Riva TNT AGP 16MB	£ 78 ( 92)
Matrox Millennium G200 AGP 8MB SGRAM	£ 70 ( 83)
Matrox Millennium G200 AGP 16MB SGRAM	£ 104 (123)
Matrox Marvel G200 AGP 8MB SGRAM	£ 157 (185)
Creative Voodoo 2 12MB Accelerator card	£ 79 ( 93)

## CPUs/Motherboards

<b>CPUs</b>	
AMD K6-2 300MHz	£ 61 ( 72)
AMD K6-2 350MHz	£ 74 ( 87)
AMD K6-2 380MHz	£ 96 (113)
AMD K6-2 400MHz	£ 108 (127)
Intel Celeron 300A	£ 49 ( 58)
Intel Celeron 333	£ 65 ( 77)
Intel Celeron 366	£ 104 (123)
Intel Pentium II 333MHz	£ 143 (169)
Intel Pentium II 350MHz	£ 157 (185)
Intel Pentium II 400MHz	£ 231 (272)
Intel Pentium II 450MHz	£ 387 (455)
<b>Motherboards</b>	
PCI AT Pentium All w/512K Cache (Asus)	£ 66 ( 78)
PCI Pentium II BX (Asus)	£ 80 ( 94)
PCI Pentium II BX (Supermicro)	£ 75 ( 88)
PCI Dual Pentium II BX w/SCSI Controller	£ 244 (287)
PCI Dual Pentium II GX w/SCSI Controller	£ 298 (351)

## Hard Disk Drives

3.2GB EIDE	£ 84 ( 99)
4.0GB EIDE	£ 89 (105)
6.4GB EIDE	£ 102 (120)
8.4GB EIDE	£ 118 (139)
8.4GB EIDE UDMA (IBM)	£ 140 (165)
10.0GB EIDE UDMA	£ 134 (158)
10.0GB EIDE UDMA 7200rpm (IBM)	£ 203 (239)
13.0GB EIDE UDMA	£ 149 (176)
14.0GB EIDE UDMA (IBM)	£ 260 (306)
4.0GB SCSI	£ 241 (284)
9.0GB SCSI	£ 346 (407)
4.0GB Wide SCSI	£ 245 (288)
9.0GB Wide SCSI	£ 333 (392)

Adaptec ISA 1520 SCSI controller	£ 47 ( 56)
Adaptec PCI 2920 SCSI controller	£ 76 ( 90)
Adaptec PCI 2940 SCSI controller	£ 162 (191)
Adaptec PCI 2940 U/W SCSI controller	£ 203 (239)
Adaptec PCI 3940 SCSI controller	£ 312 (367)
Adaptec PCI 3940 U/W SCSI controller	£ 347 (408)

## Backup Devices

4GB (8GB compressed) int. DAT Streamer +tape	£ 469 (552)
12GB (24GB compressed) int. DAT Streamer +tape	£ 675 (794)
4GB (8GB compressed) ext. DAT Streamer +tape	£ 574 (675)
12GB (24GB compressed) ext. DAT Streamer +tape	£ 774 (910)
Seagate Tape Stor 8000 IDE	£ 182 (214)
Seagate Tape Stor 8000 SCSI	£ 216 (254)
Iomega 100MB ZIP+ external ATAPI Drive	£ 88 (104)
Iomega 100MB ZIP internal ATAPI Drive	£ 52 ( 62)
Iomega 100MB ZIP Cartridge	£ 7 ( 9)
Iomega 2GB JAZ Internal SCSI Drive	£ 220 (259)
Iomega 2GB JAZ Int. SCSI Drive+controller	£ 269 (317)
Iomega 2GB JAZ Cartridge	£ 60 ( 71)
Panasonic LS120 Drive + disk	£ 59 ( 70)

## The Company



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## Network Products

ISA 16-bit Ethernet Combo Card	£ 15 ( 18)
ISA 16-bit 3COM509 Combo Network Card	£ 45 ( 53)
PCI 32-bit 3COM905 Base-T Network Card	£ 42 ( 50)
PCI 32-bit 3COM900 Combo Network Card	£ 49 ( 58)
8-port 10 base-T mini Ethernet Hub	£ 42 ( 50)
16-port 10 base-T mini Ethernet Hub	£ 87 (103)

## Fax/Modems

Internal 56.6KBPS Voice Fax Modem	£ 52 ( 62)
External 56.6KBPS Voice Fax Modem	£ 87 (103)
Sportster External 56.6KBPS Flash Fax Modem	£ 87 (103)
US Robotics External 56.6KBPS Message Pro	£ 128 (151)
Pace ISDN Terminal Adapter	£ 216 (254)

All modems are BABT Approved

Prices in brackets include VAT @ 17.5% E.&O.E.

## Multimedia Devices

32max Speed IDE CD-ROM	£ 30 ( 36)
32x Speed SCSI CD-ROM	£ 60 ( 71)
5x Speed DVD drive + controller + games	£ 146 (172)
Yamaha CD-Rewriter 4416 (controller required)	£ 244 (287)
HP 8100i CD Writer (EIDE)	£ 272 (320)
SoundBlaster 16	£ 16 ( 19)
SoundBlaster PCI64	£ 14 ( 17)
SoundBlaster AWE 64 (OEM)	£ 27 ( 32)
SoundBlaster AWE 64 Gold	£ 81 ( 95)
SoundBlaster Live! PCI (Value)	£ 46 ( 55)
SoundBlaster Live! PCI (Retail)	£ 117 (138)
dp Hi-Fi Power Speakers (150W PMPO)	£ 16 ( 19)
dp Subwoofer + Speakers	£ 30 ( 36)
Yamaha YSTM20 Speakers	£ 38 ( 45)
Yamaha YSTM10 Subwoofer	£ 42 ( 50)
PCWorks FourPoint Surround Speakers	£ 45 ( 53)

## Video/TV Combo Cards

The All in Wonder Pro offers a comprehensive one card solution for 2D acceleration, 3D acceleration, video capture, TV and Teletext functions.	
ATI All in Wonder Pro AGP 4MB	£ 63 ( 75)
ATI All in Wonder Pro AGP 8MB	£ 74 ( 87)
The Hauppauge WinTV PCI board is a single slot Plug and Play card with a 125-channel TV tuner, video digitiser and Teletext Decoder.	
Hauppauge PCI WinTV Card	£ 57 ( 67)
Hauppauge PCI WinTV & Radio Card	£ 90 (106)

## Monitors



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for iiyama monitors only

14" iiyama ProLite Flat Panel LCD Monitor .26dot, 1024x768 @ 79KHz	£ 592 (696)
17" iiyama S701GT SVGA Colour Monitor Shadow Mask, .26dot, 1600x1200 @ 75KHz	£ 275 (324)
17" iiyama A701GT SVGA Colour Monitor DiamondTron, .25ag, 1600x1200 @ 72KHz	£ 320 (376)
21" iiyama A102GT SVGA Colour Monitor DiamondTron, .28ag, 1800x1440 @ 75KHz	£ 690 (811)

14" CTX SVGA Colour Monitor  
Shadow Mask, .28dot,  
800x600 @ 72KHz  
£ 94 (111)



15" CTX PR500T Colour Monitor  
Trinitron, .25ag,  
1024x768 @ 85KHz  
£ 149 (176)

17" CTX VL700 FST SVGA Colour Monitor  
Shadow Mask, .28dot, 1280x1024 @ 60KHz £ 175 (206) |

17" CTX PR710T FST SVGA Colour Monitor  
Trinitron, .25dot, 1600x1200 @ 70KHz £ 293 (345) |

19" CTX VL950T SVGA Colour Monitor  
.26dot, 1600x1200 @ 75KHz £ 315 (371) |

19" ADI MicroScan 6P SVGA Colour Monitor  
FST Tube, .26dot, 1600x1200 @ 75KHz £ 335 (394) |

## Scanners

Featuring USB support (Win98 systems only), the 4100C boasts optical resolutions of 600dpi (1200dpi enhanced), 36-bit colour image processing and infinite scaling for monochrome logos and line art. (Includes 1 year return to base warranty.)



HP ScanJet 4100C £ 130 (153)

## Input Devices

Keytronics Keyboard for Windows 95	£ 11 ( 13)
Microsoft Natural Keyboard	£ 39 ( 46)
Microsoft IntelliMouse	£ 24 ( 47)
Microsoft Joystick	£ 19 ( 23)
Microsoft Joypad	£ 21 ( 25)



Printers



Modems



Memory

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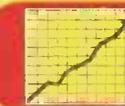
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If your Novatech PC is not ready for dispatch within 2 working days, we'll deliver it for free!



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### Printers

Brother	Exc Vat	Inc Vat
BRO-HL820	£159	£186.83
BRO-HL1040	£179	£210.33
BRO-HLP2000 Mono PSC	£239	£280.83
BRO-HL1050	£209	£245.58
BRO-HL1058	£225	£264.38
BRO-HL1070	£275	£323.13
BRO-HL1078	£289	£339.58
BRO-HL166e	£579	£680.33

Canon	Exc Vat	Inc Vat
BJC250 Colour	£70	£82.25
BJC4300	£91	£106.93
CAN/BJC4300+Scanner	£121	£142.18
BJC80 Colour	£139	£163.33
BJC7000 A4 1200x600 dpi	£146	£171.55
BJC5000 A3 1440 dpi	£165	£193.88
BJC50 Colour	£188	£220.90
BJC4650 A3	£196	£230.30

Epson	Exc Vat	Inc Vat
Stylus 440 Colour	£98	£115.15
Stylus 640 Colour	£127	£149.23
Stylus 700 Colour	£138	£162.15
Stylus 740 Colour 1440dpi	£152	£178.60
Stylus Colour 750 1440dpi	£169	£198.58
Stylus Colour 850	£198	£232.65
Stylus Colour 900 1440dpi	POA	
Stylus Photo EX A3	£282	£331.35
Stylus 1520 A2 Portrait	£432	£507.60
Stylus 3000 A2 1440dpi	£843	£990.53
Stylus Pro 5000 A3	£1,499	£1,761.33

Hewlett Packard	Exc Vat	Inc Vat
DeskJet 420 Colour	£66	£77.55
DeskJet 695 Colour	£96	£112.80
DeskJet 710C+Phot Ret II	£126	£148.05
DeskJet 720C	£141	£165.68
DeskJet 880C USB C6409A	£164	£192.70
D/Jet 895CXI NW+Phot Ret II	£186	£218.55
DeskJet 1120C A3+Phot Ret	£285	£334.88
DeskJet 2000C C4530A	£450	£528.75
D/Jet 2000CN C5901A+Jdr	£675	£793.13
DeskJet 2500C A3/C2684A	£705	£828.38
DeskJet 2500CM/C2685A	£900	£1,057.50
OfficeJet 635C	£296	£347.80
O/JeT 700C PC Fax Win/NT	£323	£379.53
OfficeJet 1170 S/C/P	£491	£576.93
OfficeJet 1175 S/C/P/Fax	£614	£721.45
L/JeT 1100 Ret/C4224A	£232	£272.60
LaserJet 2100 C4170A	£423	£497.03
LaserJet 2100M C4171A	£480	£564.00
LaserJet 2100TN C4172A	£600	£705.00
LaserJet 3100 C3948A	£471	£553.43
LaserJet 4000 C4118A	£741	£870.68
LaserJet 5000 A3/C4110A	£966	£1,135.05
L/JeT 8000 A3/C4085A	£1,477	£1,735.48
LaserJet 8100 32ppm	£1,687	£1,982.23

Kyocera	Exc Vat	Inc Vat
FS 600	£218	£256.15

### Scanners

Epson	Exc Vat	Inc Vat
G17000 SCSI Mac&PC	£138	£162.15
G17000 Phot SCSI Mac&PC	£187	£219.73

Hewlett Packard	Exc Vat	Inc Vat
ScanJet 4100C USB	£116	£136.30
ScanJet 4200 USB W98	£117	£137.48
S/JeT 5200/C7197A USB/Para	£151	£177.43

### Scanners

Hewlett Packard	Exc Vat	Inc Vat
S/JeT 6200C Not Mac Comp	£238	£279.65
S/JeT 6250C Not Mac Comp	£278	£326.65

Novatech	Exc Vat	Inc Vat
AS6E Parallel	£39	£45.83
AS12E Parallel	£49	£57.58

### Hard Drives

Fujitsu	Exc Vat	Inc Vat
MPC3043AT-UD 4.3Gb 11ms	£86	£101.05
MPC3064AT-UD 6.4Gb 11ms	£106	£124.55

Seagate	Exc Vat	Inc Vat
ST33232A 3.2Gb UDMA	£76	£89.30
ST34321A 4.3Gb 11ms Ultra	£81	£95.18
ST36422A 6.4Gb 9.5ms av Ult.	£92	£108.10
ST38641A 8.6Gb 10.5ms Ult.	£112	£131.60
ST39140A 9.1Gb 9.5ms Ult.	£136	£159.80

Western Digital	Exc Vat	Inc Vat
AC33200A 3.2Gb UDMA	£81	£95.18
AC34300 4.3Gb UDMA	£87	£102.23
AC36400 6.4Gb UDMA	£96	£112.80

### Modems

Hayes	Exc Vat	Inc Vat
Accura 56k Internal	£82	£96.35
Accura 56K External	£85	£99.88

Novatech	Exc Vat	Inc Vat
Novatech 56k Internal PCI	£36	£42.30
Novatech 56K Internal ISA	£39	£45.83
Novatech 56K External ISA	£49	£57.58

3Com	Exc Vat	Inc Vat
Voice/Fax 56k V90 Ext	£67	£78.73
Message Plus 56k V90 Ext	£82	£96.35
V90 56k PCMCIA Mhertz	£103	£121.03
Professional Mess. V90 Ext	£101	£118.68

### Monitors

ADI	Exc Vat	Inc Vat
Microscan 4P 15" TCO 95	£115	£135.13
Microscan 5G 17"	£255	£299.63
Microscan 5GT 17" Trinitron	£279	£327.83

CTX	Exc Vat	Inc Vat
15" 1569SE VL500	£101	£118.68

Iiyama	Exc Vat	Inc Vat
Vision Master Pro 400 17"	£284	£333.70
Vision Master Pro 450 19"	£398	£467.65

Novatech	Exc Vat	Inc Vat
14" 0.28mm DP Digital	£79	£92.83
15" 0.28mm DP	£99	£116.33
17" 0.28mm DP	£169	£198.58
17" 0.28mm DP 1600*1200	£257	£301.98

### Networking

NDC (PCI)	Exc Vat	Inc Vat
NWE4300 RJ45 BNC 10Base/T	£19	£22.33
NE 100 TX RJ45 10/100 Auto	£28	£32.90

Dlink	Exc Vat	Inc Vat
528CT Combo PCI	£18	£21.15
530TX PCI 10/100 RJ45 Auto	£23	£27.03

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Graphics Cards

Table with columns: Creative Labs, Exc Vat, Inc Vat. Rows include GB Riva TNT 16Mb AGP, 3D Blaster Voodoo 2 12Mb, Hauppauge Win TV PCI NICAM, Win TV Radio, Novatech PCI S3 3D DX Mpeg 2Mb, PCI S3 3D DX Mpeg 4Mb, AGP Trident 3D-975 4Mb.

Processors

Table with columns: AMD, Exc Vat, Inc Vat. Rows include K6 3D 400 Mhz, IDT WinChip 3D-200Mhz, WinChip 3D-225Mhz, WinChip 3D-240Mhz, Intel Pentium II 350Mhz + Fan, Pentium II 400Mhz, Pentium II 450Mhz.

Sound Cards & Speakers

Table with columns: Creative Labs, Exc Vat, Inc Vat. Rows include SB 16 Value Non IDE, SB 128 PCI, AWE 256 Value, SB Live 256 PCI, 20 Watt(RMS) Speak/Chan., Novatech 60 Watt Speakers, 16 Bit PNP Sound Card, 3D Interactive PCI S/Card, 300 Watt Speaks+Sub Woof.

Memory

Table with columns: 30 Pin, 72 Pin Non Parity, 72 Pin EDO, 72 Pin Parity, 168 Pin Dimms. Rows include 4Mb 30 pin Simm, 8Mb Simm, 16Mb Simm, 32Mb Simm, 8Mb Simm, 16Mb Simm, 32Mb Simm, 8Mb Simm, 16Mb Simm, 32Mb Simm, 32Mb 3.3v SD Ram U/Buf TX, 64Mb 3.3v SD Ram U/Buf LX, 64Mb 3.3v SD Ram U/Buf BX, 128Mb 3.3v SD Ram U/Buf.

Removable Storage

Table with columns: Iomega, Exc Vat, Inc Vat. Rows include Zip Internal IDE, ZIP Drive Parallel Plus 1 Disk, Zip Drive SCSI External, Zip Drive 250Mb Parallel, Zip 100Mb Disk, Zip 250Mb Disk.

CD-ROM Drives

Table with columns: Hitachi, Novatech, HP Reader Writer, Exc Vat, Inc Vat. Rows include 32 x EIDE 80ms Av access, 45 x EIDE, 7200i 2xWrite 6xRead EIDE, Writer Plus Parallel/C4381A, Writer 8100 24r4w2r Int IDE.

Motherboards

Table with columns: Microstar (ATX), Exc Vat, Inc Vat. Row includes 5169 Aladdin 5 100Mhz AGP.

PC Cases

Table with columns: Novatech, Exc Vat, Inc Vat. Rows include Mini Tower AT-CE Approv., Midi Tower ATX-CE Approv., D/Top Case ATX-CE Approv.

Processors

Table with columns: AMD, Exc Vat, Inc Vat. Rows include K6 3D 333 Mhz, K6 3D 350 Mhz, K6 3D 380 Mhz.

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Canon BN22/32	(B1101) £5	P/H £25
Canon BJ130	(B1481) £11	
Canon BJ300/330	(B1642) £9	
Canon BJ10E/EX/20	(BC01) £12	
Canon BJ200/EX/230	(BC02) £12	
Canon 210/240/250	(BC02/05) £13	£16
Canon 240/250 Photo Cart.	(BC06) £16	KIT £22
Canon 240/250 Fluorescent	(BC09F) £21	
Canon BJ300/70/80	(BC10) £22	
Canon BJ300/70 TANKS 3's	(BC10) £10	
Canon BJ70/80	(BC11) £26	
Canon BJ70/80 TANKS 3's	(BC11) £10	£14
Canon BJC600	(BJ20) BK/C/M/Y £5	£5
Canon BJC600 Series SET OF COLOURS		£18
Canon BJC600 or 610/620 PRINTHEAD		£82
Canon BJC800	(BJ1643) £13	£16
Canon BJC4000 Series (BC20/21E)	£19	£25
Canon BJC4000 TANKS (BC21)	£5	£13
Canon 42/4300/45/4650 Photo Cart. (BC22E)		£20
Canon 42/4300/45/4650 Photo Kit (BC22K)		£25
Canon 42/4300/45/4650 Fluorescent (BC29F)		£21
Canon BJC7000 (BC50/61) £22	£24	
Canon BJC7000 Colour Ink Tank (BC16)	£15	£15
Canon BJC7000 (BC62)	£33	

EPSON INK CARTRIDGES	Black	Colour
Stylus Col. Pro XL	(20034/20036) £9	£17
Stylus Pro XL+	(20034/20066) £9	£18
Stylus Col. II/III/820	(20047/20049) £12	£16
StylusPhoto/700/EX	(20093/20110) £13	£12
Stylus 200	(20047/20097) £12	£18
Stylus 300 (4 Colour Cart.)	(20138) £13	£18
Stylus 500	(20093/20097) £13	£18
Stylus 400/600	(20093/20098) £13	£14
Stylus 800/1520	(20108/20089) £14	£14
Stylus 440/640	(20187/20191) £13	£14
Stylus 740	(20189/20191) £14	£14
Stylus 1500	(20062/20049) £27	£16
Stylus 3000	(20118/C130/M126/Y122) £32	£32
Stylus 5000 Pro	(20118/C147/M143) £32	£32

HP INK CARTRIDGES	Black	Colour
HP Deskjet Portable	(51633/25) £14	£17
HP DJet 500 Series	(51626/25) £16	£17



HP DESKJET 500 SERIES BLACK 3 x 26A Ink Cart @ £15.65 £46.95

EPSON INKJET PAPER MEDIA	Price
A6 Photo Glossy Film (10) (S041107)	£3
A6 Photo Inkjet Card (50) (S041054)	£6
A6 Photo Sticker Paper (5) (S041144)	£4
4" x 6" Photo Paper (20) (S041134)	£5
5" x 8" Photo Inkjet Card (30) (S041123)	£5
8" x 10" Photo Inkjet Card (30) (S041122)	£12
A4 Photo Adhesive Paper (10) (S041106)	£8
A4 Glossy (15) (S041071)	£20
A4 Photo Glossy (20) (S041126)	£6
A4 Photo Paper (20) (S041140)	£8
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A4 Transparency (30) (S041053)	£32
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A3+ 360 Dpi (100) (S041066)	£20
A3+ Photo Glossy (20) (S041133)	£18
A3+ Photo Paper (20) (S041143)	£23
A2 Photo Glossy (20) (S041123)	£32
A2 720/1440 Dpi (30) (S041079)	£22
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A2 Panoramic Photo (10) (S041145)	£11
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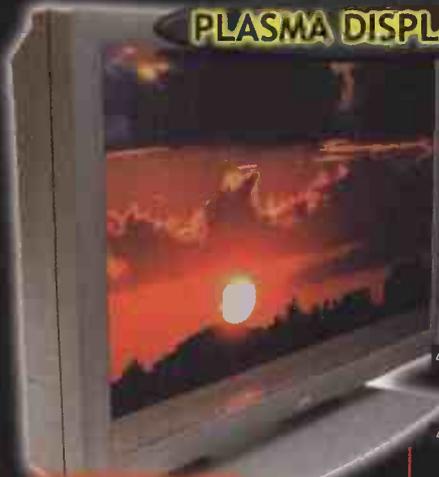
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 CP-X955 (1024x768) LCD 1100ANSI 7.9Kg **£3950**



**CP-S830 £2145**  
**True SVGA (800x600)**  
**Bright 500 Ansi Lumens**  
**Ultra light weight 5kg**  
**Remote control with mouse function**  
**Free carry-bag**

## EPSON

A new ultra portable, ultra bright projector.

Epson EMP-5500 (800x600) LCD 650ANSI 4.2Kg **£3095**  
 Epson EMP-5100 (800x600) LCD 750ANSI 6.6Kg **£3195**  
 Epson EMP-5300 (800x600) LCD 1200ANSI 6.2Kg **£3795**  
 Epson EMP-7100 (1024x768) LCD 650ANSI 6.7Kg **£4195**  
 Epson EMP-7200 (1024x768) LCD 1000ANSI 6.2Kg **£4595**  
 Epson EMP-7300 (1024x768) LCD 1200ANSI 6.2Kg **£6695**  
 Epson EMP-7500 (1024x768) LCD 800ANSI 4.2Kg **£4595**



**EMP5500 £3095**  
**True SVGA (800x600)**  
**High brightness 650 Ansi Lumens**  
**Remote PC operation**  
**Free carry-bag**

# SONY



VPL-SC50  
£2495

Small but beautifully formed - the new Sony SC50 & XC50 are the latest and lightest additions to Sony's range, with the smallest footprint of any projector on the market.

- Built-in stereo speakers**
- Remote mouse receiver + laser pointer**
- Built-in shutter**
- Ultra-small footprint**
- Free carry-bag**

Sony VPL-SC50	(800x600)	LCD	500ANSI	3.7Kg	<b>£2495</b>
Sony VPL-XC50	(1024x768)	LCD	600ANSI	3.7Kg	<b>£3795</b>
Sony VPL-S900	(800x600)	LCD	1000ANSI	5.8Kg	<b>£3495</b>
Sony VPL-X600	(1024x768)	LCD	600ANSI	5.8Kg	<b>£3695</b>



VPL-S900 £3495

The larger Sony VPL-S900/X600 packs powerful, persuasive performance into a magnesium die-cast portable package. Three integral speakers. Choose from either SVGA or XGA resolutions (1000 ansi and 600 ansi respectively), they are tough for the road, yet handsomely styled for the boardroom. Supplied with remote control/mouse receiver and laser pointer.

- Three integral speakers**
- Remote mouse receiver + laser pointer**
- Free carry-bag**

# TOSHIBA

TLP710Z £4695

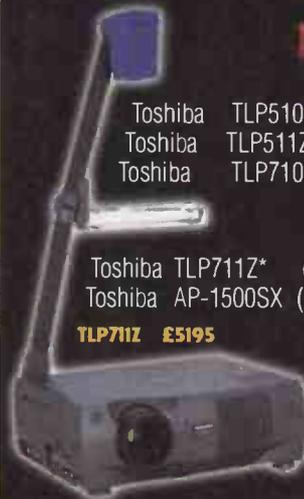


An excellent range of XGA resolution projectors with new models featuring amazing brightness, these next-generation projectors will revitalise your meetings and give a whole new look to your presentations. Whichever model you choose, be ready for dazzling screen

brightness that's double that of previous projectors with no need to darken the room at all. 2 models have a built-in document camera\* (shown below), enabling crystal clear projection of text and 3-dimensional objects with breathtaking resolution.

## New Lower Prices!

Toshiba	TLP510Z (1024x768)	LCD	650ANSI	9.4Kg	<b>£2995</b>
Toshiba	TLP511Z* (1024x768)	LCD	650ANSI	8.0Kg	<b>£3495</b>
Toshiba	TLP710Z (1024x768)	LCD	1400ANSI	6.9Kg	<b>£4695</b>



Toshiba	TLP711Z* (1024x768)	LCD	1400ANSI	8.6Kg	<b>£5195</b>
Toshiba	AP-1500SX (1280x1024)	HDLV	1500ANSI	13.3Kg	<b>£8595</b>

TLP711Z £5195

- 1400 Ansi lumens**
- Dual polarisation technology**
- Flicker suppressing auto-tracking circuit**
- Digital zooming**
- Full auto-scanning**
- Free carry-bag**

# PHILIPS



Hopper SV10 £2595

The Philips Hopper - Pack and Go - no cooldown, so pack it away in its carry bag (included) and make a quick getaway! This small near-silent machine can be ceiling mounted. The Proscreen Projectors from Philips have unique 'Limesco' inside for full automatic multiscan data input handling, VGA up to SXGA resolutions without information loss.

Proscreen4600 Endurance	(800x600)	LCD	500ANSI	8.0Kg	<b>£2195</b>
Proscreen4650	(800x600)	LCD	850ANSI	7.5Kg	<b>£2695</b>
HopperSV10	(800x600)	LCD	600ANSI	5.5Kg	<b>£2595</b>
Proscreen4750	(1024x768)	LCD	750ANSI	7.5Kg	<b>£3595</b>
Proscreen4750i	(1024x768)	LCD	1100ANSI	7.5Kg	<b>£4995</b>

## 4,000 Hour Lamp Life!

These projectors offer extraordinary lamp life from 4,000 - 8,000 hours with virtually constant light output for a perfect picture quality. Free carry-bag.



Proscreen 4650 £2695

# DVMS

How personal is your projector? SVGA & XGA projectors the size of a letter, the height of a floppy disk & the weight of a laptop, or if you want real performance in ambient light there's the superbright 1200 Ansi DPB 1200.



DL450 £1995

DL450	(800x600)	DLP	500ANSI	4.5Kg	<b>£Call</b>
DLX650	(1024x768)	DLP	600ANSI	4.5Kg	<b>£3195</b>
DPB 1200	(1024x768)	LCD	1200ANSI	9.8Kg	<b>£4950</b>

**EASY TO USE:** With colour-coded cables, simple set-up and auto-synching, you'll get your presentations up and running in no time. The DL450 and DLX650 have an optional built in TV tuner. Free carry-bag.

# PLUS

These ultra-portable projectors combine light weight, performance and economy in a unit not much larger than your laptop. Using the PLUS original optical engine and DLP technology they are invaluable for stunning presentations. The new XGA UP1100 is very bright, light and excellent value.



UP-880 £3195

Plus UP800	(800x600)	DLP	600ANSI	4.5Kg	<b>£2395</b>
Plus UP880	(800x600)	DLP	800ANSI	4.5Kg	<b>£3195</b>
Plus UP1100	(1024x768)	DLP	1000ANSI	4.7Kg	<b>£4295</b>

**Digital zoom function (up to 400%), ceiling mounting and rear-projection capabilities, remote mouse receiver and wireless remote control, and above all, superb portability. Free carry-bag.**

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**Warranties:** All our products are covered by full U.K. return-to-base warranties, normally 2 years. Extended and Swap-out warranties available on request.  
**Payment:** We accept cheque/BACS/Draft. Corporate accounts available on request. Business leasing available for limited companies.  
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8.30 - 5.30 Mon-Fri  
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**W2.FM  
DIRECT**

# Total Solution Supplier



- \*19" Rack Mountable PC.
- \*386/486/Pentium CPU Cards.
- \*RAM/ROM Disk Card.
- \*PC-Bus Card Cage.
- \*Passive backplane for Pentium Plug-in CPU Cards.
- \*Rack Mountable Monitor.
- \*PC Peripherals.
- \*Data Acquisition Cards.
- \*Digital I/O Cards.
- \*D/A Output Cards.
- \*Timer/Counter Card.
- \*RS-232/422/485 Interface.
- \*Relay Output Card.
- \*Stepping Motor Controller Cards.
- \*Signal Conditioning.
- \*Wiring Accessories.
- \*Application Software.

## Monitor Rack Mount Chassis & Keyboard

- \* For 15" Monitors
- \* Extruded aluminium handles
- \* Knock down type , 8U High
- \* Protective Lexon anti-glare screen built in
- \* 14" Touch screen option available

**£139**

### Keyboard & Draw

- \*19" Rack-mount keyboard drawer with space for mouse **£176**
- \*19" Rack-mount keyboard drawer with trackball **£139**



- \*Accommodates 14" monitors
- \*19" rack/panel mount
- \*Provides hold-down device
- \*Touch Screen Support **£205**

## 19" Rack Mount HD/CD ROM Chassis

### Special Offer



- \* 19" Hard Disk/CD ROM enclosure 4U.
- \* Designed for disk array system.
- \* 6 x 5 1/4" Horizontal drive bay.
- \* Optional SCSI ID selector & Cables.
- \* 300W CE/TUV/UL approved AT power supply fitted.
- \* Hot swappable internal SCSI/IDE rack available. **£280**
- \*Dual Push/Pull cooling fans.
- \*Removable air filter.
- \*Lockable security door.
- \*Front and rear keyboard connection.
- \*250W CE/TUV AT PSU (300W optional).
- \* Motherboard Version (baby AT) **£159**
- \* Passive Backplane Version **£235**



## PC-based Industrial Automation

UCS supplies a wide range of computer products and services for commercial, industrial and engineering applications. We evaluate, design and implement significant and cost effective system solutions.



### Quality Assurance

Every product that we recommend and sell is manufactured with quality and reliability, and tested to the highest industry standards.



### Technical Support

Our application engineers are always ready to assist you in solving your application problem before and after purchase. We will also inform you about suitable products as they become available.



### Service

Our business philosophy is simple, customers come first. We listen and give unbiased expert advice to ensure that your application needs are satisfied within your projected price range.

## U.C.S.

Provides reliability, service and value.

## CPU Cards

### All-in-one Pentium PCI/ISA CPU Card



### Advanced PCI/ISA Dual Pentium-ProAll-in-oneSBC

- \* Dual Intel Pentium-Pro processor up to 200 MHz
- \* Award PCI/ISA system BIOS
- \* Support 8MB up to 256MB of FPM,EDO and BEDO DRAM
- \* Intel 82440FX PCI chipset

Pentium Pro PCI Card, Multi I/O, SCSI	<b>£428</b>
Pentium PCI Card, Multi I/O, MMX, SCSI, VGA, Ethernet	<b>£347</b>
Pentium PCI Card, Multi I/O, MMX, SCSI 486 Card, Multi I/O, VGA, LCD, Ethernet, SSD, RS422/485	<b>£270</b>
No CPU with any of above items	<b>£211</b>
All-in-one CPU Card with 386SX CPU	<b>£39</b>

\* All The Above Have Built in Multi I/O Controller

### Passive Backplane Series



- \* 3 PCI slots, 4 ISA slots
- \* 1 dedicated slot for PCI CPU card
- \* 4-layer PCB with ground and power planes
- \* Plug-in termination resistors **£53**
- \* Terminal block connector and LED power indicators

Quad PC-BUS (For Four CPU Cards)	<b>£53</b>
Dual PC-BUS (For Two CPU Cards)	<b>£55</b>
PC-BUS Passive Backplane Series 6,8,12,20 & Quad slot boards also available.	
PCI/AT-bus Optical Expansion Kit	<b>£578</b>

## Digital Input and Output

### Digital I/O Counter Card



- \* 32 bit digital I/O
- \* 3 Programmable counter
- \* High output driving capacity **£84**
- \* Large breadboard area

32-Channel Isolated Digital I/O Card	<b>£92</b>
144-bit (24 * 6) of Buffered Digital I/O Card	<b>£145</b>
8-Channel Relay + 8 Channel Isolated Digital I/O	<b>£90</b>
48-bit Digital I/O Cards	<b>£67</b>
32-Ch. High Speed Digital I/O + Vectored IRQ	<b>£131</b>
6/12 Channel 12bit D/A Output Card (16 Channel Digital I/O) Also Available.	

## Best Buys

### Programmable I/O Card:



- \* 48 programmable I/O lines
- \* 3 Independent 16 bit counters
- \* Address selectable **£24**
- \* 16 LED I/O indicators

### PC AD/DA Converter:



- \* 12 bit resolution **£49**
- \* 16 Single ended A/D input
- \* One channel analogue output
- \* Port address selectable

\*All prices exclude VAT, carriage and are subject to availability.  
\* Please note that the minimum order is £50, any order below this value will be subject to a small surcharge of £5.

\*All prices are subject to change without prior notice.

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Tel: (01902) 428688

Fax: (01902) 428670

\* All prices exclude VAT, carriage and are subject to availability. \* All prices are subject to change without prior notice.

## Industrial Comms.

- 8-port Intelligent RS-232/422 Card
- \* 8-port RS-232 interface
- \* 12-MHz 80286 processor
- \* Speeds up to 38.4kbps (8-ports) **£248**
- \* Optional isolated RS-422 interface
- \* Free Dos and Windows driver, Datascop utility (PC-ComLIB) included

8 Port Connection Box for the above **£52**

62 Way D-Type to 8 Line 25 Ways D-Type Cable for the above **£25**

### 4-port RS-232/422/485 Interface Card



- \* Each port configurable for RS-232/422/485
- \* 16C550 UARTs with 16-byte FIFO
- \* Automatic RS-485 data flow control
- \* Extended "AT" interrupt selection **£128**
- \* Free Dos and WIN NT driver (PC-ComLIB) included

Single port RS-232/RS-422/RS-485 (FIFO) **£59**

Dual port RS422/485 Interface Card **£59**

Isolated Dual-port RS-232 Current-loop Card **£96**

Isolated Dual-port RS-422/485 PC Card **£80**

Serial/Parallel Card **£19**

Dual Serial RS232 (FIFO, Com1,2,3,4 Selectable) **£29**

Dual Parallel Card (EPP/ECP) **£22**

4 Port RS232 (FIFO) standard **£35**

IEEE-488 Interface Board **£131**

RS232/422 or 485 Converter self powered **£59**

RS232/20mA Current Loop Converter **£59**

PCMCIA RS232/422/485 Module with Cable **£139**

8 Slot PCV Bus Card **£65**

6 Slot Wallmount IPC Chassis (full length) **£222**

Micro Box IPC 3 Slots Chassis **£83**

## PC/104 Modules

### 386SX-33 CPU Module

- \* Low power consumption
- \* Up to 4MB ZIP DRAM
- \* Built in RTC with lithium battery backup
- \* Single +5 V operation
- \* 60° operation **£104**

Super I/O Module **£67**

Four Port RS232 Interface Card **£82**

Ethernet Module **£74**

30-KHz A/D Module **£226**

PCMCIA Slot Module **£107**

Flat Panel/CRT VGA Module **£88**

Solid State Disk Module 1MB **£66**

Fax/Modem Module **£136**

48-channel Digital I/O Module **£73**

Secondary PCMCIA Module **£104**

Isolated RS-232 and RS-422/485 Module (two port) **£131**

## Solid-State Storage

### High Density Flash Solid State Disk Card

- \* Auto Bootable
- \* 1-32 MB on-board capacity
- \* Up to 128MB (4 cards per system)
- \* True FFSR software included
- \* Fully MS-DOS, MS-Windows, Unix and QNX compatible
- With 1 Mb Flash on board **£55**
- With 2 Mb Flash on board **£73**
- With 8 Mb Flash on board **£184**

## Adam 4000 Series



### GENERAL FEATURES

- \* RS-485 to host (2-wire)
- \* Field-configurable via software
- \* ASCII command/response protocol
- \* +10 to +30 VDC power requirement
- \* Mounts easily on panel, DIN-rail or piggyback stack

Analog Input Module(mV, VmA, Thermocouple) **£127**

Analog Input Module(mVmA, High Voltage) **£116**

Analog Input Module(RTD) **£116**

Analog Input Module with Display(mVmA) **£150**

Analog Output Module(V or mA) **£116**

8-channel Analog Input Module(mV, VmA) **£150**

8-channel Thermocouple Input Module **£162**

Digital I/O Module **£82**

Isolated Digital I/O Module **£82**

Relay Output Module **£82**

Counter/Frequency Input Module with Display **£150**

RS-422/485 repeater Module **£65**

Isolated RS-232/RS-485 Converter Module **£65**

Digital I/O Module Carrier Backplane **£43**

Industrial Power Supply for Panel Mounting (3A) **£61**

## Data Acquisition & Control Card

### 16 Channel Analogue and Digital I/O Card

- \* 12 Bit A/D, 30KHz Sampling
- \* 16 Single-ended channels
- \* Programmable Input Range
- \* Pacer, Software Trigger
- \* Two 12Bit D/A, 16 Digital I/O & Counter **£203**

Multi Function 8Ch., 12Bit Card with Prog Gain **£145**

High Speed 16Ch., 12 Bit, 100KHz Card **£287**

32 Channel, 12Bit Data Acquisition Card **£227**

High Performance 330KHz Card with Prog Gain **£460**

Modular Multifunction 16Ch, 16Bit, 100KHz Card **£460**

## Motion Control

### 3-axis Stepping Motor Control Card

- \* Step rate up to 16 Kpps
- \* 3 intelligent chips for simultaneous control of up to 3 motors
- \* 5 DI per axis for limit switching

\* Half-sized PC add-on card **£265**

3-axis Servo Motor Control Card **£287**

## Industrial WorkStations

### Industrial Workstation with 15" Colour CRT Monitor



- \* Highly-Integrated PC workstation
- \* 1280x1024 colour CRT Monitor
- \* 19" rack/panelmount **£1309**
- \* 250-watt power supply
- \* 4 ISA/ 2 PCI/ 1 CPU slot passive backplane

\* Industrial 19" Rackmount Workstation with ISA/PCI Backplane, PSU, 10.4" Color TFT **£1637**

ISA Backplane, PSU, 10" Color CRT **£1649**

Mini Industrial Workstation, 4 Slots, PSU, 10.4" Color TFT **£1156**

## Superslim Panel PC

### PC-Based industrial computer



This slim panel PC provides a fully integrated 486-based PC a built in 50W power supply and comprehensive networking support, three RS-232 and one RS-232/422/485 ports. It is an ideal solution for distributed control and monitoring applications.

\* 486 all-in-one PC-board (up to DX4-120&5x86)

\* Up to 32Mb RAM

\* 10.4" Colour TFT LCD display, touch screen optional

\* Watchdog timer

\* One Parallel (ECP, EPP) **£944**

\* 4 Isolated digital I/O

\* Space for 2.5" HDD

\* Ethernet, Novell NE-2000 compatible, 10 Base-T interface

\* 342mm(W)x265mm(H)x61.5mm(D)

\* Touch Screen Optional **£1068**

Pentium Panel PC, 10.4" DSTN Colour Display **£2357**

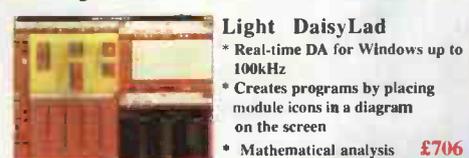
Pentium Panel PC, 13.8" TFT Colour, Floppy, CD Drive

## Application Software

### GENIE Software

- \* Real-time DA & C, graphic display & data logging (MS Windows)
- \* Icon-based, object oriented
- \* Unlimited number of blocks & I/O devices
- \* User programmable blocks
- \* Supports most LabCards & ADAM 4000 Series

Genie Light Versin **£159**, Genie full version **£268**



### Light DaisyLad

- \* Real-time DA for Windows up to 100kHz
- \* Creates programs by placing module icons in a diagram on the screen
- \* Mathematical analysis **£706**

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SAMSUNG M

**SAMSUNG M6000**

- Max RAM 128MB; 4MB VRAM
- 12.1" to 14.1" TFT Display
- Touchpad Pointing Device
- Li-Ion Battery; PC-Card 2 x II or 1 x III
- 24 Speed CD-ROM
- 64 Bit PCI Bus; Zoom Video Compliant



Model	CPU / Display / RAM / Hard Disk / CD-ROM	Ex-VAT	Inc-VAT
M6260cT W98	P Cel 266; 12.1" SVGA TFT; 32MB; 3.2GB; 24 Speed CD	£1135	£1333.63
M6300cT W98	P Cel 300; 12.1" SVGA TFT; 32MB; 3.2GB; 24 Speed CD	£1310	£1539.25
M6300cX W98	P Cel 300; 13.3" XGA TFT; 32MB; 4.0GB; 24 Speed CD	£1545	£1815.38
M6300cXT W98	PII Cel 300; 14.1" XGA TFT; 32MB; 4.0GB; 24 Speed CD	£1635	£1921.13
M6330X W98	PII P333; 13.3" XGA TFT; 32MB; 4.0GB; 24 Speed CD	£1810	£2126.75
M6330XT W98	PII P333; 14.1" XGA TFT; 64MB; 6.4GB; 24 Speed CD	£1999	£2348.83
M6360XT W98	PII P366; 14.1" XGA TFT; 64MB; 6.4GB; 24 Speed CD	£2360	£2773.00
VL5300T W95	P300MMX; 12.1" SVGA TFT; 32MB; 3.2GB; 24 Speed CD	£1020	£1198.50
SN6260cT W98	P Cel 266; 12.1" SVGA TFT; 32MB; 4.0GB; CD Option	£1455	£1709.63
SN6300cT W98	P Cel 300; 12.1" SVGA TFT; 32MB; 4.0GB; CD Option	£1545	£1815.38



SAMSUNG VL

**SAMSUNG VL**

- Max RAM 128MB; 2MB VRAM
- Built-in Power Supply
- Built-in 24 Speed CD-ROM and FDD
- PC-Card 2 x II or 1 x III

## TOSHIBA



SATELLITE 4010CDT

**SATELLITE SERIES**

- Up to PII 366
- 12.1" to 14.1" TFT Display
- Max RAM 192MB
- Up to 6GB HDD
- 24 Speed CD-ROM
- PC-Card 2 x II or 1 x III



LIBRETTO 110CT

**LIBRETTO 110CT**

- P233MMX
- 7.1" TFT Display
- 32MB Ram
- 3.82GB HDD
- PC-Card 2 x II
- Mini-Card Station



TECRA 8000

**TECRA 8000 SERIES**

- Up to PII 366
- 12.1" to 14.1" TFT Display
- Max RAM 256MB
- Up to 14GB HDD
- Max 24 Speed CD with Optional DVD

Model	CPU / Display / RAM / Hard Disk / CD-ROM	Ex-Vat	Inc Vat	Model	CPU / Display / RAM / Hard Disk / CD-ROM	Ex-Vat	Inc Vat
Libretto 100CT	P166MMX; 7.1" SVGA TFT; 32MB; 2.16Mi.B; No CD	£ 910	£1069.25	Portege 7010CT	PII P300; 12.1" SVGA TFT; 32MB; 3.82GB; CD Option	£1935	£2273.63
Libretto 110CT	P233MMX; 7.1" SVGA TFT; 32MB; 3.82GB; No CD	£1090	£1280.75	Portege 7020CT	PII P366; 13.3" XGA TFT; 64MB; 6GB; CD Option	£ Call	£ Call
Sat 4010CDS	PII P266; 12.1" SVGA DS; 32MB; 3.82GB; 24 Speed CD	£ 985	£1157.38	Tecra 8000	PII P266; 12.1" SVGA TFT; 32MB; 4.0GB; 24 Speed CD	£1783	£2095.03
Sat 4010CDT	PII P266; 12.1" SVGA TFT; 32MB; 3.82GB; 24 Speed CD	£1170	£1374.75	Tecra 8000	PII P266; 13.1" SVGA TFT; 64MB; 6.0GB; 24 Speed CD	£1869	£2196.08
Sat 4030CDS	P Cel 300; 13" SVGA DS; 64MB; 3.82GB; 24 Speed CD	£ Call	£ Call	Tecra 8000	PII P300; 13.1" SVGA TFT; 64MB; 6.0GB; 24 Speed CD	£2099	£2466.33
Sat 4030CDT	P Cel 300; 13.3" XGA TFT; 64MB; 3.82GB; 24 Speed CD	£ Call	£ Call	Tecra 8000	PII P300; 14.1" SVGA TFT; 64MB; 7.63GB; DVD/16x CD	£2499	£2936.33
Sat 4060XCdT	PII P333; 13.3" XGA TFT; 64MB; 5.96GB; 24 Speed CD	£ Call	£ Call	Tecra 8000	PII P333; 13.3" XGA TFT; 64MB; 6GB; 24 Speed CD	£ Call	£ Call
Sat 4080XCdT	PII P366; 14.1" XGA TFT; 64MB; 5.96GB; 24 Speed CD	£ Call	£ Call	Tecra 8000	PII P366; 14.1" XGA TFT; 64MB; 6GB; 24 Speed CD	£ Call	£ Call
Portege 3010CT	P266MMX; 10.4" SVGA TFT; 32MB; 3.2GB; CD Option	£1365	£1603.88	Tecra 8000	PII P366; 14.1" XGA TFT; 64MB; 14GB; DVD	£ Call	£ Call
Portege 3020CT	P300MMX; 10.4" SVGA TFT; 32MB; 6GB; CD Option	£ Call	£ Call				



EXTENSA

**ACER EXTENSA**

- Up to PII 300
- Max RAM 128MB
- 12.1" to 13.3" XGA TFT Display
- 20 Speed CD-ROM



Model	CPU / Display / RAM / Hard Disk / CD-ROM	Ex-VAT	Inc-VAT
TM 312D	P233MMX; 8.4" SVGA DS; 32MB; 3.2GB; No CD	£ 850	£998.75
TM 312T	P233MMX; 8.4" VGA TFT; 16MB; 2.1GB; Ext. CD	£1099	£1291.33
TM 313T	P266MMX; 8.4" SVGA TFT; 32MB; 3.2GB; 24 Speed CD	£1199	£1408.83
Ext 501T	P266MMX; 12.1" SVGA TFT; 32MB; 3.2GB; 20 Speed CD	£1150	£1351.25
Ext 710T	PII P233; 12.1" SVGA TFT; 32MB; 3.0GB; 20 Speed CD	£1199	£1408.83
Ext 711TE	PII P266; 13.3" XGA TFT; 64MB; 4.0GB; 20 Speed CD	£1599	£1878.83
Ext 712TE	PII P300; 13.3" XGA TFT; 64MB; 6.0GB; 24 Speed CD	£1999	£2348.83
Ext 712TEV	PII P300; 13.3" XGA TFT; 64MB; 6.0GB; 20 Speed CD	£2225	£2614.38
TM 7300	PII P266; 13.3" XGA TFT; 64MB; 4.0GB; 20 Speed CD	£2099	£2466.33



TRAVELMATE 7300

**ACER TRAVELMATE**

- PII 266
- Max RAM 128MB
- 13.3" XGA TFT Display
- PC-Card 2 x II or 1 x III
- 20 Speed CD-ROM

# Panasonic



CF25

**Panasonic CF25 Mk III**  
 Built for the Mobile Environment  
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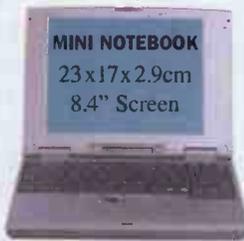
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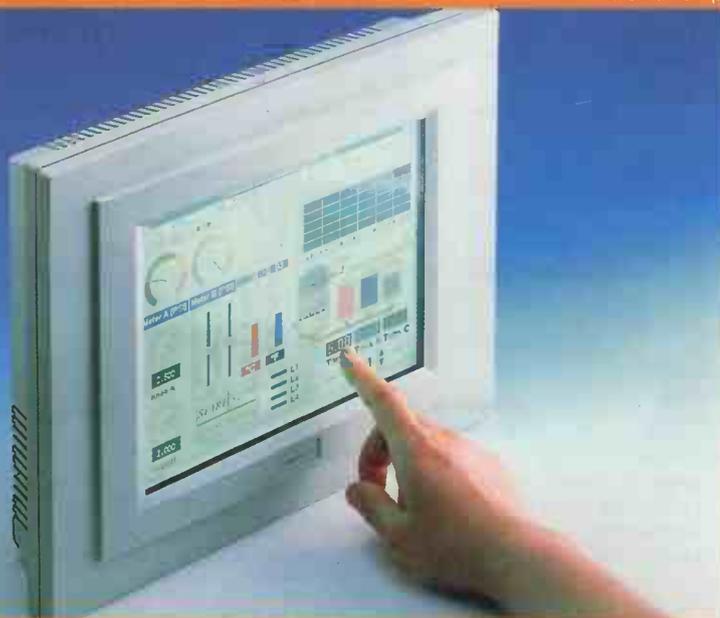
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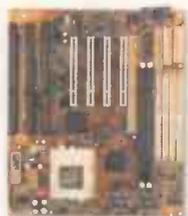
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### ARMADA 7800

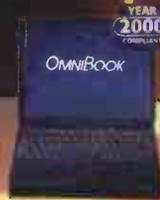
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P75 17" 0.28.....£359  
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300GL, PII400, 32MB, 3.2GB, X32, WIN98.....£979  
300GL, PII450, 64MB, 6.4GB, WIN98.....£1129  
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PII350, 64MB, 6GB, X32, WIN NT.....£699  
PII400, 64MB, 6GB, X32, WIN 95/98.....£749  
PII400, 64MB, 6GB, X32, WIN NT/4.....£799  
PII450, 64MB, 8GB, X32, WIN 95/98.....£909  
PII450, 64MB, 8GB, X32, WIN NT/4.....£959  
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PII350, 32MB, 3.2GB, WIN 95.....£669  
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MODEL	PRICE
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MODEL	PRICE
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MODEL	PRICE
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<b>CTX 600</b>	(SVGA)	550ANSI	5.4Kg	<b>£2295</b>

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**EPSON  
QUALITY**

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MODEL				PRICE
<b>EMP 5500</b>	(SVGA)	650ANSI	4.2Kg	<b>£3450</b>
<b>EMP 5300</b>	(SVGA)	1200ANSI	6.2Kg	<b>£4495</b>
<b>EMP 7300</b>	(XGA)	1200ANSI	6.2Kg	<b>£6700</b>
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MODEL				PRICE
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MODEL				PRICE
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MODEL				PRICE
<b>L556</b>	(SVGA)	600ANSI	5Kg	<b>NEW £2995</b>
<b>L595</b>	(SVGA)	700ANSI	8.5Kg	<b>£2600</b>
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**INFOCUS**

**EDITOR'S  
CHOICE**

The Infocus 725 is very portable at only 5kg. With 750 ANSI Lumens and true 800x600 resolution and the facility to compress to 1024x768 resolution. July 97 Editor's Choice PC Magazine.



MODEL				PRICE
<b>INFOCUS 725</b>	(SVGA)	750ANSI	5Kg	<b>£3400</b>
<b>INFOCUS 735</b>	(XGA)	650ANSI	5Kg	<b>£4450</b>
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**NEC**

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Contrast  
Ratio**

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MODEL				PRICE
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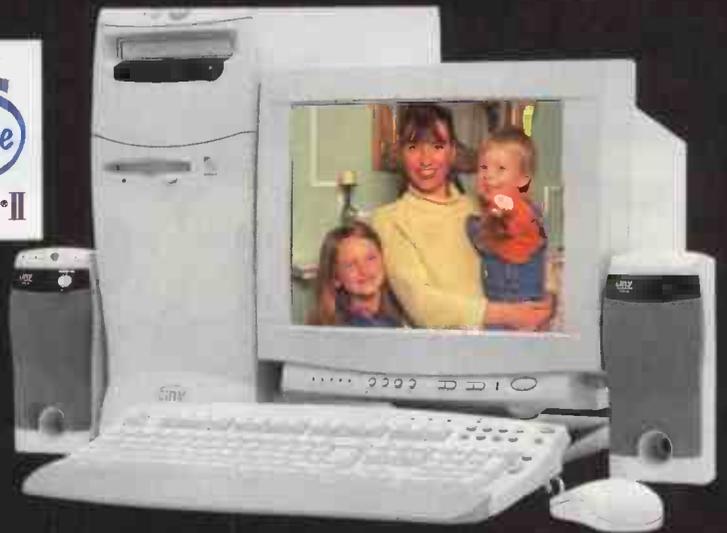
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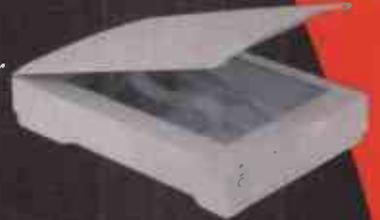
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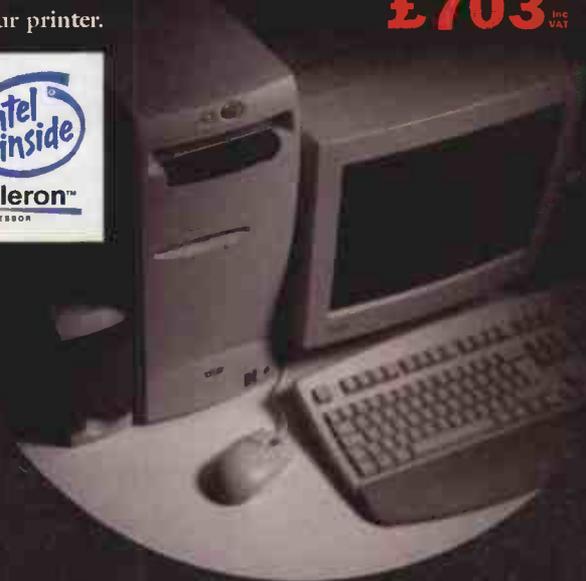
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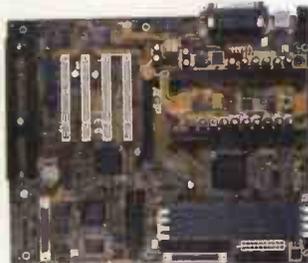
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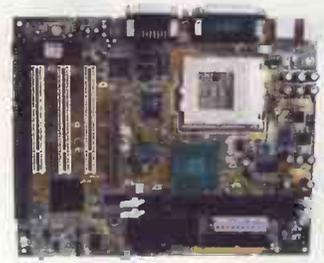
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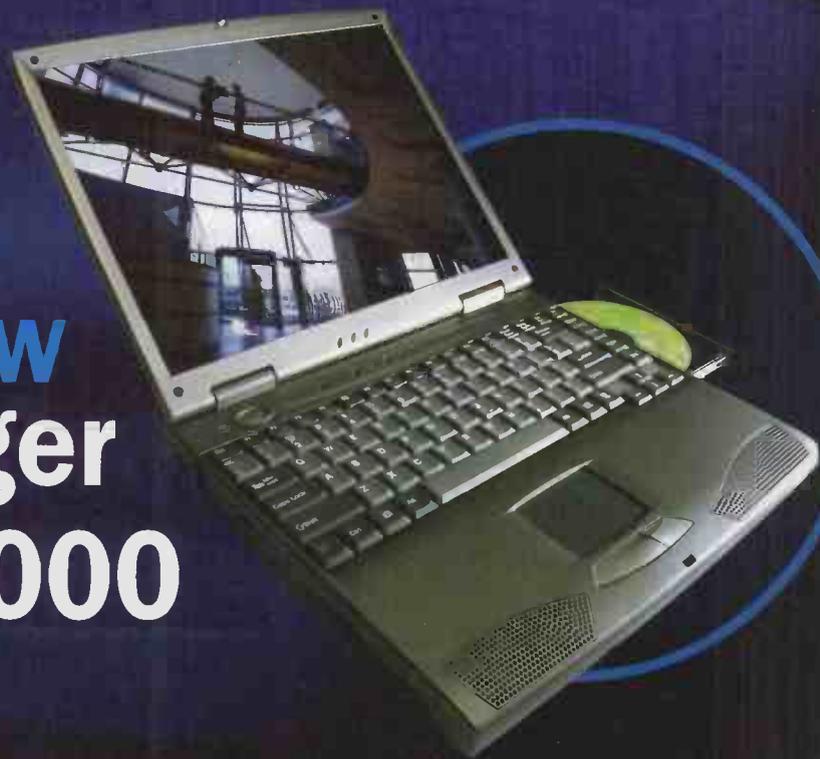
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## ValeStart Installation

Do you need a little help installing your new computer?

For just (£50+vat) **£57.58** a ValeStart technician will deliver, install and commission your PC.

Please note that actual products (including screen displays) may not exactly match the photographic representations. On-site warranty applies to UK mainland only. Industry standard practice is to quote a monitor's CRT size – the actual viewing area is approximately 1" less. Hard disk capacities are quoted in thousands of millions of bytes (as is industry standard practice). Bundled versions of video cards, sound cards and software are not full retail packs, and the software features on-line documentation. Occasionally we may supply vouchers for software titles which need to be redeemed with the manufacturers. Note that we are unable to offer a 14 day moneyback guarantee on any software, or on any special order item which is not featured in the advertisement. The Intel Inside logo, Pentium Processor logo, Pentium, MMX, and Celeron are trademarks of Intel Corporation. Microsoft is a registered trademark and the Office logo is a trademark of Microsoft Corporation. All other trademarks acknowledged. All orders are subject to Evesham Micros' standard Terms and Conditions of trading – these are available on request. E&OE. As part of our staff training programme some telephone calls may be monitored.



## The Best Service and Support

### on-site Warranty



We know that if something goes wrong you need expert help and that you don't want the inconvenience of despatching your system back to the manufacturer. We have our own nationwide team of skilled engineers ready to support you. Such is our confidence in the quality of our systems that we are able to make this industry leading offer: Prestige and Platinum systems are now covered by two years parts and labour on-site warranty as standard. Fileservers and DesignStations come with three years cover.

Compare this with our competitors - you could pay as much as £200 for 2 years on-site cover!!



## 0800 Technical Support



Above: Our technical support department which now numbers over 45 strong.

"I have found your helpline and on-site maintenance to be of the highest standard." G. B., Flitwick

"Very prompt and helpful service" C.R. Shipston on Stour

"An excellent, no quibble, fast service. Thank you." G. D., Bristol

"As usual, excellent – decisive, expert support gets my business every time. Showroom pre-sales always objective and informed." I. C., Cheltenham

At Evesham Micros we understand it isn't enough to just build an award winning PC range like EveshamVale, we must have the right people to support it. We believe in taking care of our customers, from friendly sales advice to unrivalled technical support.

Our EveshamVale technical department is manned by friendly & knowledgeable staff, who have a full history and build schedule of each individual PC. You can now reach them via a Freephone number, Monday to Saturday.



"Evesham showed how customer service should be done"

"I've always been dubious of mail order purchasing but my fears have proved unfounded in dealing with Evesham Micros. The equipment and backup service surpass all expectations!" P. D., Shepperton

## All EveshamVale PCs Include the following:

- 14 Day moneyback guarantee
- 2 years on-site warranty (PC Systems)
- 2 years warranty with accidental damage insurance (notebooks)
- 3 years on-site warranty (Fileservers and DesignStations)
- Lifetime freephone technical support hotline
- Free Internet access with local rate call charges (models with modems)
- Year 2000 ready BIOS
- 2 USB ports (PCs), 1 USB port (notebooks)
- 1 parallel port and 2 serial ports with 16550 UART
- 3.5" 1.44MB floppy disk drive
- Windows98 installed, with full manuals and disks supplied. (Windows95 is a no cost option)
- TÜV approved power supply with low noise fan

BIRMINGHAM  
**0121 683 6868**  
Fax: 0121 683 6869

CAMBRIDGE  
**01223 323 898**  
Fax: 01223 322 883

MILTON KEYNES  
**01908 230 898**  
Fax: 01908 230 865

LEEDS  
**0113 203 2000**  
Fax: 0113 203 2001

DUBLIN  
**00 353 1 855 4444**  
Fax: 00 353 1 855 4440

# EveshamVale

Buy Now  
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SEE PAGE 3 FOR DETAILS

## Prestige

Our benchmark PC - available in a range of configurations to suit most applications.

### Prestige Standard models:

- ◆ Intel 440 AGPset (Celeron models)
- ◆ Intel 440BX AGPset (Pentium models)
- ◆ 128kB processor speed cache (Celeron models)
- ◆ 512kB cache (Pentium models)
- ◆ ATI 8MB Xpert98 AGP video card
- ◆ 15" EveshamVale monitor (Celeron models)
- ◆ 17" EveshamVale monitor (Pentium models)
- ◆ 2x Universal Serial Bus (USB) ports
- ◆ 14 day moneyback guarantee
- ◆ 2 years on-site maintenance for parts and labour
- ◆ Lifetime technical support hotline
- ◆ Choice of desktop or mid-tower case
- ◆ 'Windows95' keyboard
- ◆ Logitech 'wheel' mouse

### Prestige MULTIMEDIA, Media98 and Office models also have the following hardware:

(in addition to Standard)

- ◆ 32x CD-ROM drive
- ◆ SoundBlaster 16 compatible sound (Celeron models)
- ◆ SoundBlaster PCI 64 value wavetable sound (Pentium models)
- ◆ Zy-Fi amplified speakers



Prestige Multimedia PC with 17" EveshamVale monitor



### EveshamVale Prestige: 15" monitor, 32MB RAM, 4GB HDD

Processor:	Standard	MULTIMEDIA	Media98	Office
Intel Celeron™ 333	(£519-VAT) £609.83	(£559-VAT) £656.83	(£639-VAT) £750.83	(£689-VAT) £809.58

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

### EveshamVale Prestige: 15" monitor, 64MB RAM, 6.4GB HDD

Processor:	Standard	MULTIMEDIA	Media98	Office
Intel Celeron™ 366	(£599-VAT) £703.83	(£639-VAT) £750.83	(£719-VAT) £844.83	(£769-VAT) £903.58
Intel Celeron™ 400	(£629-VAT) £739.08	(£669-VAT) £786.08	(£749-VAT) £880.08	(£799-VAT) £938.83

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

### EveshamVale Prestige: 17" monitor, 64MB RAM, 6.4GB HDD

Processor:	Standard	MULTIMEDIA	Media98	Office
Intel Pentium® II 400	(£869-VAT) £1021.08	(£909-VAT) £1068.08	(£989-VAT) £1162.08	(£1039-VAT) £1220.83
Intel Pentium® III 450	(£969-VAT) £1138.58	(£1009-VAT) £1185.58	(£1089-VAT) £1279.58	(£1139-VAT) £1338.33
Intel Pentium® III 500	(£1099-VAT) £1291.33	(£1139-VAT) £1338.33	(£1219-VAT) £1432.33	(£1269-VAT) £1491.08

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

### Prestige upgrades

32MB to 64MB RAM (Celeron 333 models)	(£40-VAT) £47.00
64MB to 96MB RAM (Celeron 366/400 models)	(£40-VAT) £47.00
64MB to 128MB RAM (Pentium models)	(£80-VAT) £94.00
15" Taxan Ergovision 550 TCO95 monitor (Celeron models)	(£30-VAT) £35.25
17" EveshamVale monitor (Celeron models)	(£85.11-VAT) £100.00
17" Taxan Ergovision 735 TCO99 monitor (Celeron models)	(£130-VAT) £152.75
17" Taxan Ergovision 735 TCO99 monitor (Pentium models)	(£45-VAT) £52.88
Diamond PCI v.90 56k voice capable modem	(£49-VAT) £57.58
Panasonic CW7582 recordable CD drive with Adaptec Easy CD Creator software (OEM version)	(£165-VAT) £193.88
ValeStart delivery and installation service (see page 3)	(£50-VAT) £58.75

### Create your own CDs!

- ◆ Create data and multimedia CDs on your PC.
- ◆ Create custom audio CDs which are playable in any CD player.
- ◆ Send video postcards on CD that automatically play on any PC.
- ◆ Back up important files such as tax records, spreadsheets and financial data.



Panasonic CW7582 recordable CD drive with Adapter Easy CD Creator software (OEM version).....(£165+VAT) £193.88

## SpaceStation

### Prestige Celeron 366MHz MULTIMEDIA PC with Taxan Crystalvision 640 TCO95-S flat panel LCD monitor

- ◆ 14.1" LCD panel with 1024 x 768 resolution
- ◆ Perfectly flat square display with no distortion

◆ Similar screen area to a 17" conventional monitor

◆ Only 170 mm overall depth including stand



(£1099+VAT)  
£1291.33

Including the PC!

## Reviews



"The Prestige is a good machine at a very competitive price. If you're working to a tight budget, this machine must be at the top of your short list" EveshamVale Prestige



"Superb value in a machine which doesn't compromise on speed either... comes with such a good selection of peripherals and software that it scoops our Value award." EveshamVale Prestige



"A well specified system for the money, proving that a good PC can be built from Intel's newest budget CPU. The big question is the performance, and this proved to be good. Considering you're getting a fast high-spec PC from a well known company, the price seems very reasonable. The EveshamVale Prestige 333 is a well-rounded PC and shows what can be done with Intel's latest chip. If you're after decent performance at a reasonable price, it's a good choice." EveshamVale Prestige 333



"What is certainly more than adequate is the performance of the 333MHz Celeron, which gave a PC Plus index of 4.59, over 50% faster than some of the 6x86MXs in the group and a good 20% faster than the fastest K6-2. This machine is a little scorchier at a very competitive price." EveshamVale Prestige 333, Performance 10/10



"an excellent starter pack of software... Internally there is plenty of space to plug in any extra bits and pieces... I feel I'd have to recommend this machine to the beginner." EveshamVale Prestige



"A good, well-designed machine offering superb value for money." EveshamVale Prestige



"If ever a PC offered everything in one bundle, then this is it... Bags of upgrade potential, plus some great extras." Computer Buyer, Prestige TNT Media98+

# SPRING SPECIALS

Now Open  
On Sunday  
10:00 - 20:00

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## Scorcher 400

Intel have done it again with the new Celeron 400 processor. Using the same ground breaking technology as the 333, the new model brings a performance boost to keep it firmly ahead of the competition in the power per pound stakes. Combine this with EveshamVale's legendary build quality and service, and you have an unbeatable performance PC at a budget price.

### Scorcher MULTIMEDIA models:

- Latest Intel motherboard with Intel 440ZX AGPset
- 128kB processor speed cache
- 64MB SDRAM
- 6.4GB hard disk
- 8MB ATI Xpert98 AGP 3D graphics accelerator
- 15" EveshamVale monitor
- 32x CD-ROM drive
- Creative Labs SoundBlaster PCI 64 Value wavetable sound
- Zy-Fi amplified speakers
- Diamond PCI v.90 56k voice capable modem
- Free Internet access (local rate call charges)
- 2x Universal Serial Bus (USB) ports
- Logitech 'wheel' mouse
- 14 day moneyback guarantee
- 2 years on-site maintenance for parts and labour
- Lifetime technical support hotline
- Midi-tower case



Prestige Scorcher 400 with optional 17" monitor

### Scorcher 400 - 15" monitor, 64MB RAM, 6.4GB HDD

Processor:	MULTIMEDIA	Media98	Media98+	Office
Celeron™ 400	(£680-VAT) <b>£799</b>	(£760-VAT) <b>£893</b>	(£816.17-VAT) <b>£959</b>	(£810-VAT) <b>£951.75</b>

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

## Scorcher 400 - DVD TNT

Both Scorchers use the very latest Intel manufactured motherboards utilising the 440ZX chipset for the very best in quality and performance.

### Scorcher 400 with the following upgrades:

- 8.4GB Ultra ATA hard disk
- 16MB STB Velocity 4400 2D/3D graphics accelerator
- 3rd generation 4.8x DVD-ROM drive
- 17" EveshamVale monitor

### Scorcher 400 DVD TNT - 17" monitor, 64MB RAM, 8.4GB HDD

Processor:	MULTIMEDIA	Media98	Media98+	Office
Celeron™ 400	(£850.21-VAT) <b>£999</b>	(£930.21-VAT) <b>£1093</b>	(£986.38-VAT) <b>£1159</b>	(£980.21-VAT) <b>£1151.75</b>

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

## Prestige - DVD TNT

TNT models get their name from STB's exciting new Velocity 4400 graphics accelerator. At its heart is the Vidia Riva TNT graphics engine, which has quickly established itself as the 2D/3D chipset. Add 128MB RAM and the latest DVD-ROM drive and you have a system that is at the cutting edge of technology.

### Scorcher 400 DVD TNT with the following upgrades:

- Intel 440BX AGPset
- 512kB cache (Pentium models)
- 128MB SDRAM (100MHz)
- 10.2GB Quantum Fireball EX Ultra ATA hard disk with Shock Protection System for long term reliability (Pentium models)
- Zy-Fi Pro amplified speakers

### Prestige DVD TNT - 17" monitor, 128MB RAM, 10.2GB hard disk

Processor:	MULTIMEDIA	Media98	Office
Celeron™ 400	(£979-VAT) <b>£1150.33</b>	(£1059-VAT) <b>£1244.33</b>	(£1109-VAT) <b>£1303.08</b>
Pentium® II 400	(£1149-VAT) <b>£1350.08</b>	(£1229-VAT) <b>£1444.08</b>	(£1279-VAT) <b>£1502.83</b>
Pentium® III 450	(£1249-VAT) <b>£1467.58</b>	(£1329-VAT) <b>£1567.58</b>	(£1379-VAT) <b>£1620.33</b>
Pentium® III 500	(£1379-VAT) <b>£1620.33</b>	(£1459-VAT) <b>£1720.33</b>	(£1509-VAT) <b>£1773.08</b>

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Media98+ models include all the Media98 extras plus

Add a splash of colour



1100 Colour Jetprinter

The family colour printer with - Disney's Print Studio CD-ROM

## "Vive La Différence"

A great printer / scanner combination at a great price

### Mustek ScanExpress 12000P colour scanner



- 1200x600dpi genuine optical resolution
- 36-bit colour
- iPhoto Plus scanning and re-touching software
- Textbridge OCR software
- Micrografix Picture Publisher v6.0

"High quality photo scan: The Mustek 12000P captures the colour and especially the detail of our test photo brilliantly - the quality isn't far off what a professional drum scanner can achieve."

"Greyscale text scan: The level of detail achieved by the Mustek 12000P is remarkable again." Computer Buyer, Mustek 12000P



### LEXMARK 3200 Colour Jetprinter

- 1200x1200dpi resolution
- Laser sharp black text, vivid colours and ultimate six colour photo quality with optional photo cartridge.



"Our group test showed that this printer offers great print quality at a bargain price. You'll have trouble telling it's black text from laser output, whilst colour was the best of all in the test."

Computer Buyer, Lexmark 3200

Both are 4x the resolution of the cheaper units bundled with most systems!

Give your Scorcher or Platinum TNT Live! the scanning and printing quality it deserves for just (£169.36-VAT) **£199**

## Microsoft software bundles

Available with any EveshamVale Multimedia or Media98 PC - see page 2 for details

BIRMINGHAM  
0121 683 6868  
Fax: 0121 683 6869

CAMBRIDGE  
01223 323 898  
Fax: 01223 322 883

MILTON KEYNES  
01908 230 898  
Fax: 01908 230 865

LEEDS  
0113 203 2000  
Fax: 0113 203 2001

DUBLIN  
00 353 1 855 4444  
Fax: 00 353 1 855 4440

# Evesham Vale

BUY NOW  
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## Platinum

We have long maintained the tradition that every component in the Platinum must be chosen for outstanding performance, reliability and pleasure of use, as well as being technically bang up to date. This formula has earned the Platinum range a consistent stream of awards from the specialist press.

### All Platinum models:

- ◆ Chaintech 6BTM motherboard with Intel 440BX AGPset, 100MHz bus, and SeePU and APTC technologies
- ◆ 128kB processor speed cache (Celeron models)
- ◆ 512kB cache (Pentium models)
- ◆ 64MB SDRAM, (100MHz)
- ◆ 2x Universal Serial Bus (USB) ports
- ◆ 8.4GB Ultra ATA high speed hard disk
- ◆ 8MB ATI Xpert 98 AGP 3D graphics accelerator
- ◆ 17" Taxan Ergovision 735 TCO99 monitor with integral USB hub providing 4 USB ports.
- ◆ 32x CD-ROM drive
- ◆ SoundBlaster PCI 64 Value wavetable sound
- ◆ Zy-Fi amplified speakers
- ◆ Logitech 'wheel' mouse
- ◆ 14 day moneyback guarantee
- ◆ 2 years on-site maintenance for parts and labour
- ◆ Lifetime technical support hotline
- ◆ Keytronic PS/2 'Windows 95' keyboard
- ◆ Choice of high quality ATX style desktop or midi-tower case



Platinum Multimedia PC in the Mid-Tower case

### Create your own CDs!

- ▼ Create data and multimedia CDs on your PC
  - ▼ Create custom audio CDs which are playable in any CD player
  - ▼ Send video postcards on CD that automatically play on any PC
  - ▼ Back up important files such as tax records, spreadsheets and financial data.
- Panasonic CW7582 recordable CD drive with Adaptor Easy CD Creator software (OEM version) ..... (£165-VAT) £193.88

### Platinum Media98 models include the following Software:

- ◆ Microsoft Media98 software package (see p2 for details)

### Platinum Office models include the following Software:

- ◆ Microsoft Office Small Business Edition (see p2 for details)



Platinum - 17" monitor, 64MB SDRAM, 8.4GB HDD			
	MULTIMEDIA	Media98	Office
Celeron™ 400	(£829-VAT) £974.08	(£909-VAT) £1068.08	(£959-VAT) £1126.83
Pentium® II 400	(£979-VAT) £1150.33	(£1059-VAT) £1244.33	(£1109-VAT) £1303.08
Pentium® III 450	(£1079-VAT) £1267.83	(£1159-VAT) £1361.83	(£1209-VAT) £1420.58
Pentium® III 500	(£1209-VAT) £1420.58	(£1289-VAT) £1514.58	(£1339-VAT) £1573.33

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

### Platinum upgrades

64MB to 128MB RAM	(£80-VAT) £94.00
128MB to 256MB RAM	(£160-VAT) £188.00
64MB to 256MB RAM	(£240-VAT) £282.00
Diamond PCI v90 56k voice capable modem	(£89-VAT) £57.58
DVD-ROM drive instead of CD-ROM drive	(£60-VAT) £70.50
17" iiyama Vision Master 400 monitor	(£100-VAT) £117.50
17" iiyama Vision Master Pro 400 monitor	(£145-VAT) £170.38
17" Taxan Ergovision 745 TCO99 monitor	(£37-VAT) £43.48
17" Taxan 750 TCO95 monitor	(£150-VAT) £176.25
19" Taxan 975 TCO95 monitor	(£130-VAT) £152.75
21" Taxan 2160 TCO95 monitor	(£570-VAT) £669.75
Creative Labs SoundBlaster Live! 256 sound card	(£45-VAT) £52.88
Creative Labs SoundBlaster Live! 256 sound card with FourPointSurround speaker system	(£100-VAT) £117.50
Panasonic LS-120 120MB drive instead of 1.44MB floppy drive	(£50-VAT) £58.75
Panasonic CW7582 recordable CD drive with Adaptor Easy CD Creator software (OEM version)	(£165-VAT) £193.88
Maxtor DiamondMax 2500 10GB hard disk	(£120-VAT) £141.00
Matrox G200 Millennium 8MB video card	(£40-VAT) £47.00
ValeStart delivery and installation service (see page 3 for full details)	(£50-VAT) £58.75

## Reviews

### Platinum Range

#### "Fastest PC"



"The Vale Platinum PII/400 is the latest in a series of ever-more powerful machines we've recently seen from Evesham... Evesham's system is one for the hardcore speed freaks... The PC equivalent of a land-speed record holder... All too predictably, the Platinum 400 knocks the Platinum 333 off its perch as the fastest system yet seen in PC Pro... if you must have the fastest PC currently known to man, or at least man at PC Pro, then this is it" EveshamVale Platinum



#### "BEST PC"

"We put 18 machines through their paces. Only two come up trumps, and one is the best PC we've ever seen." Evesham has created a lightning-fast PC at a really low price point. If you want cutting-edge technology, without taking out a second mortgage, look no further. This is a worthy speed award winner." EveshamVale Platinum, PC Pro



"A great choice" "Good features make this the best choice at this lower end of the price range" "...the two-year on-site warranty is excellent value. Overall this is a system whose features belie its low price." EveshamVale Platinum, PC Magazine, Value for Money



"It's easy to set up and the user manual is informative, well written and illustrated." "Evesham Micros gets a special mention for future-proofing its PC with a DVD-ROM drive" "the insides of this PC are a tribute to good housekeeping" "GOOD POINTS: Performance, ease of use and installation, warranty, monitor, DVD-ROM drive" EveshamVale Platinum



"Evesham's latest Pentium II machine is not so much a Vale as a high plateau... Performance of the Platinum PII-333 was very strong... With a two year, on-site warranty thrown in, this Vale Platinum PII-333 wins a deserved Value for Money award." EveshamVale Platinum



"We can always rely on Evesham to come up with something good..." "The Platinum is an unpretentious machine with a lot under the hood." "Add in a two year, on-site warranty to the machine and you have a high value bundle which few suppliers can touch. This is a machine which should last you well to the millennium and is a sound buy for serious home use and the odd game. It's well worth a PC Plus Gold." PC Plus Verdict: 10/10 EveshamVale Platinum



"the machine excelled in our benchmark tests, benefiting from a speedy hard drive." "The Vale came with a 17" Taxan monitor offering a clear, steady, flicker-free image." "A machine to suit most business needs." EveshamVale Platinum



"This is a well specified system... and is configured appropriately for both home and games usage, delivering very good performance." "Evesham's Vale gets our vote for it's overall level of presentation." EveshamVale Platinum



"1 year test" "Based on price and quick delivery times, I decided to go with Evesham Micros" "GOOD POINTS: Fast, expandable, quiet fan CONCLUSION: I'm very happy EveshamVale Platinum

# EveshamVale

Buy Now  
PAY SEP '99  
See page 3 for details

## Platinum TNT Live!

Surely everything you could need in a PC - the Platinum TNT Live! has not only the STB Velocity 4400 2D/3D graphics accelerator, but incredible audio performance to match: the Creative Labs SoundBlaster Live! 256 card and FourPointSurround speaker system bring a whole new dimension to computer sound. There is also a massive hard disk and top notch branded monitor

Platinum TNT models have the following enhancements to Platinum models:

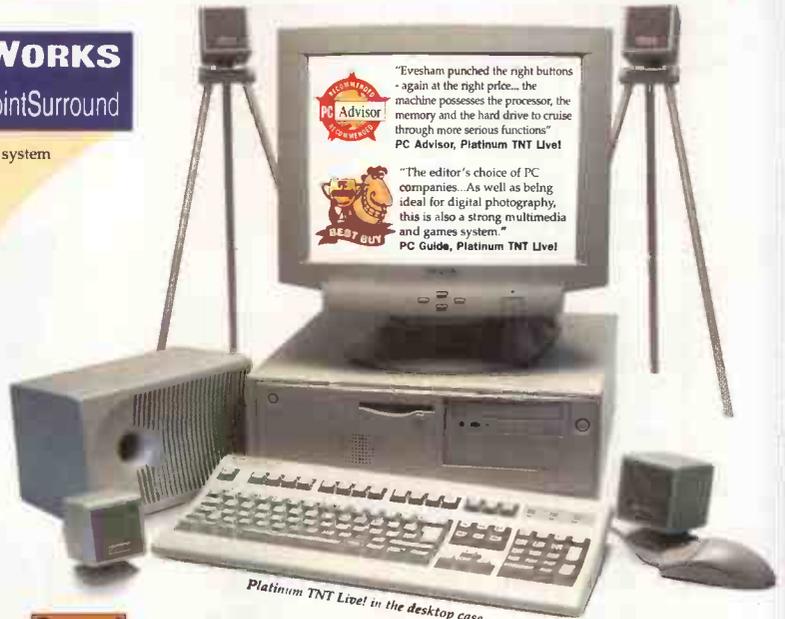
- 128MB SDRAM (100MHz)
- 12.7GB Quantum Fireball EX Ultra ATA hard disk with Shock Protection System for long term reliability
- 3rd generation 4.8x DVD-ROM drive
- 16MB STB Velocity 4400 2D/3D graphics accelerator
- Creative Labs SoundBlaster Live! 256 sound card
- Creative Labs PCWorks FourPointSurround speaker system
- Diamond PCI v.90 56k voice capable modem
- Free Internet access (local rate call charges)

Other features as Platinum models

### PCWORKS FourPointSurround

The latest speaker sound system from Creative Labs to fully utilise the advanced Environmental Audio™ and Creative Multi Speaker Support™ abilities of the SB Live! card.

- Four 2.75" wide satellite speaker cubes
- Compact, floor standing powered subwoofer
- Remote in-line master volume control



Platinum TNT Live! in the desktop case

### Platinum TNT Live! - 17" monitor, 128MB SDRAM, 12.7GB HDD

	MULTIMEDIA	Media98	Office
Penteleron™ 400	(£1119-VAT) £1314.83	(£1199-VAT) £1408.83	(£1249-VAT) £1467.58
Pentium® II 400	(£1289-VAT) £1491.08	(£1349-VAT) £1585.08	(£1399-VAT) £1643.83
Pentium® III 450	(£1369-VAT) £1608.58	(£1449-VAT) £1702.58	(£1499-VAT) £1761.33
Pentium® III 500	(£1499-VAT) £1761.33	(£1579-VAT) £1855.33	(£1629-VAT) £1914.08

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

### Sound BLASTER™ Live!

#### PCAnswers verdict

- Knockout surround sound
- Powerful sound processor
- Open and excellent EAX standard
- Not quite Digital Dolby standard

Overall 91%



"The best sound card yet from Creative Labs." PC Pro, SoundBlaster Live!



"A brilliant all-rounder for music and games. Should stand the test of time." Computer Buyer, SoundBlaster Live!



"It really is stunningly fast, giving performance roughly equal to a dedicated Voodoo II add-on-card. But remember, the Velocity 4400 is a combined 2D/3D card, meaning there's no messing about with video pass-through and no extra PCI slot is required. There's no doubt that the Riva TNT is currently the best 2D/3D chipset out there, and the Velocity uses it to supreme effect." Personal Computer World, Velocity 4400



"Blistering performance for windows and games. A clear Top 50 champion!" Computer Buyer, Velocity 4400



"The RIVA TNT chip broke a few records for its outstanding DirectX 3D gaming speed." PC Advisor, Velocity 4400

## Satellite TNT Live!

Please call and ask for technical data sheet SAT2000 for full information & FAQs

Access the Internet at 256k and receive digital video broadcast via Eutelsat live on PC.

Satellite TNT Live! models have the following enhancements to Platinum TNT Live! models:

- Adaptec 1030 satellite receiver card
  - STB DVD/MPEG 2 Movie Theatre playback card.
  - STB Velocity 4400 card specially designed for satellite.
- \*Satellite Dish is not included as standard.

Other features as Platinum models

### Satellite TNT Live! - 17" monitor, 128MB SDRAM, 12.7GB HDD

	MULTIMEDIA	Media98	Office
Pentium® II 400	(£1699-VAT) £1996.33	(£1779-VAT) £2090.33	(£1829-VAT) £2149.08
Pentium® III 450	(£1839-VAT) £2160.83	(£1919-VAT) £2254.83	(£1969-VAT) £2313.58
Pentium® III 500	(£1969-VAT) £2313.58	(£2049-VAT) £2407.58	(£2099-VAT) £2466.33

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.



Satellite TNT Live!

### Microsoft software bundles

Available with any EveshamVale Multimedia or Media98 PC - see page 2 for details

BIRMINGHAM  
0121 683 6868  
Fax: 0121 683 6869

CAMBRIDGE  
01223 323 898  
Fax: 01223 322 883

MILTON KEYNES  
01908 230 898  
Fax: 01908 230 865

LEEDS  
0113 203 2000  
Fax: 0113 203 2001

DUBLIN  
00 353 1 855 4444  
Fax: 00 353 1 855 4440

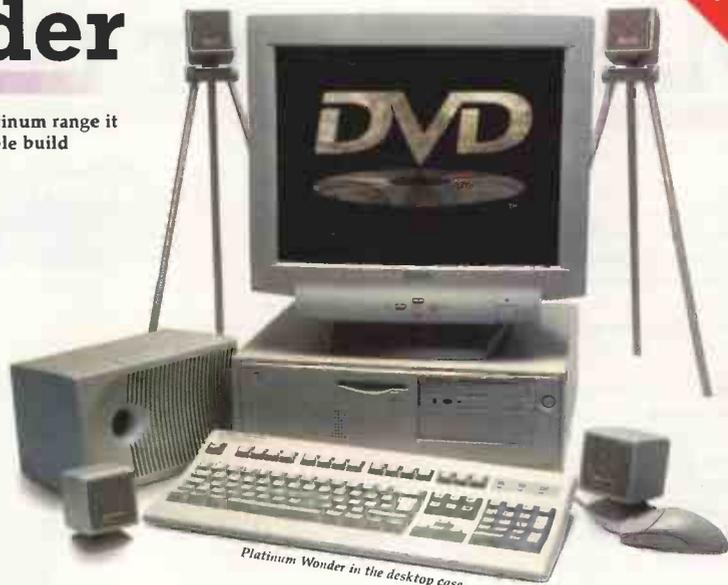
## Platinum Wonder

The Platinum Wonder is the affordable 'ultimate' PC. Like the rest of the Platinum range it is based on our proven formula of the very best components, solid and reliable build quality, and award winning customer care.

### Platinum Wonder key features:

- ◆ Intel 440BX AGPset (100MHz bus)
- ◆ 128MB SDRAM (100MHz)
- ◆ 12.7GB Quantum Fireball EX Ultra ATA hard disk with Shock Protection System for long term reliability
- ◆ ATI 8MB All-in-Wonder Pro AGP video card
- ◆ 12MB Voodoo 2 3Dfx card
- ◆ 19" Taxan Ergovision 975 TCO95 monitor
- ◆ 3rd generation 4.8x DVD-ROM drive
- ◆ Software for DVD movie playback
- ◆ Creative Labs SoundBlaster Live! 256 sound card
- ◆ Creative Labs PCWorks FourPointSurround speaker system
- ◆ Iomega zip drive
- ◆ Diamond PCI v.90 56k voice capable modem
- ◆ Free Internet access (local rate call charges)
- ◆ Microsoft Natural keyboard

Other features as Platinum models



Platinum Wonder in the desktop case

### Platinum Wonder: 128MB SDRAM, 12.7GB HDD

	MULTIMEDIA	Media98
Celeron™ 400	(£1419-VAT) £1667.33	(£1499-VAT) £1761.33
Pentium® II 400	(£1569-VAT) £1843.58	(£1649-VAT) £1937.58
Pentium® III 450	(£1709-VAT) £2008.08	(£1789-VAT) £2102.08
Pentium® III 500	(£1849-VAT) £2172.58	(£1929-VAT) £2266.58

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

CREATIVE  
CREATIVE LABS



DESKTOP  
THEATRE 5.1

Dolby Surround sound for just (£99-VAT) £119

DVD movies on a PC and surround sound gaming are the future of entertainment. This digital multi-speaker system has been specifically designed to complement the latest DVD movies and games that include the Dolby Digital (AC3) audio format. Desktop Theatre includes 4 x satellite speakers, 1 x center speaker for voice, 1 x subwoofer and a digital audio decoder that delivers a similar audio experience to that found in cinemas. This cutting edge speaker system will produce incredible, room-shaking surround effects from either Digital (AC-3) or Creative Surround. (Available at £99 as an upgrade only)

### Platinum Wonder upgrades

128MB to 256MB RAM.....	(£160-VAT) £188.00
Upgrade to 21" Taxan 2160 monitor.....	(£390-VAT) £458.25
10 pack CD-R disks.....	(£13-VAT) £15.28
DVD-RAM (rewritable) drive instead of DVD-ROM drive.....	(£380-VAT) £446.50 <small>(Includes SCSI controller card)</small>
Panasonic CW7582 recordable CD drive with Adaptec Easy CD Creator software (OEM version).....	(£165-VAT) £193.88
Upgrade to Creative Labs Desktop Theatre 5.1 speakers.....	(£99-VAT) £116.33
2x 9GB Quantum Viking II LVD SCSI super fast hard disks with Adaptec 2940 LVD U2W SCSI controller.....	(£899-VAT) £1056.33 <small>(This option includes an upgrade to the High Tower case as illustrated on P13)</small>

SEE PLATINUM MODELS FOR OTHER UPGRADES



### All-in-Wonder Pro

The 7-in-1 TV, graphics and multimedia board

The heart of the Incredible video capabilities of the Platinum Wonder is ATI's new All-in-Wonder Pro card. This combines the acclaimed 3D Rage Pro graphics accelerator found in the Xpert@work with a host of multimedia functions

- ATI Rage Pro video and graphic accelerator
- 8MB memory
- Intelligent TV tuner with DBX™ Stereo
- 2D graphics acceleration



"All in all, this is an extremely impressive package... when you bear in mind the price you could expect to pay for all those extra bits on board, it's something of a bargain... Just for once, this is a product that does everything it sets out to do, and it does it all well."

PC Pro, All-in-Wonder Pro

- 3D graphics acceleration
- High quality MPEG2 video playback
- Still and motion video capture
- TV set display



## GameStation III

The new 3Dfx Voodoo 2 chip has taken 3D gaming performance into a new dimension. The GameStation III combines the power of the 12MB Creative Labs Voodoo 2 3Dfx card with a 400Mhz Intel Celeron processor and 64MB of RAM for maximum speed. Big performance is coupled with a big monitor, a 17" model, and big sound from the incredible FourPointSurround system which comes with a sub-woofer. If you want the best in 3D performance this system offers incredible value for money!!

### GameStation III:

Prestige Celeron 400 MULTIMEDIA PC with the following upgrades:

- ◆ 10GB hard disk
- ◆ Creative Labs 12MB Voodoo 2 3Dfx card
- ◆ Creative Labs SoundBlaster Live! 256 sound card
- ◆ 17" EveshamVale monitor
- ◆ Diamond PCI v.90 56k voice capable modem
- ◆ Free Internet access (local rate call charges)
- ◆ 3rd generation 4.8x DVD-ROM drive
- ◆ Creative Labs FourPointSurround speaker system
- ◆ Suncom F15-E Talon joystick

See page 4 for full details of Prestige models

(£1020.43+VAT)

£1199

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.



Want the PC with the best game-playing performance?

# Evesham Micros

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0800 496 0800  
Web: <http://www.evesham.com>

Buy Now  
PAY SEP '99  
See page 3 for details

## MovieStation

The best DV capture card in the world is now available in PAL format, enabling us to offer this professional video editing suite...

### MovieStation 98

- 300MHz Intel Pentium® II processor
- Equal processor capable motherboard with Intel 440BX AGPset
- 28MB RAM
- 2 x 9GB Quantum Viking II LVD SCSI super fast hard disks
- Adaptec 2940 LVD U2W SCSI controller
- 4GB IDE boot disk
- ATI 8MB Xpert98 AGP 3D graphics accelerator and
- ATI 8MB Xpert@Work PCI graphics accelerator
- 19" Taxan Ergovision 975 TC095 monitor and
- 5" Ergovision 550 TC095 monitor
- Canopus DVREX-M1 digital audio and video capture with
- Lead MediaStudio Pro 5.02 - the ultimate video editing solution now with audio scrubbing
- 4th generation 4.8x DVD-ROM drive - or upgrade to DVD-RAM
- Creative Labs SoundBlaster Live! 256 sound card
- Creative Labs PCWorks FourPointSurround speaker system
- Logitech 'wheel' mouse
- Windows 98
- 4 day moneyback guarantee
- 3 years on-site maintenance for parts and labour
- Free telephone technical support hotline



**NEW**  
**REX EDIT 2.0**  
**SOFTWARE**

Improvements include the addition of simple editing transitions and titling on the Rex's native AVI files - which can be as large as 4GB.

**Cv ratings**

Performance	5
Features	5
Ease of use	4
Value for money	4
<b>Overall rating</b>	<b>90%</b>

"Video capture was rock solid from either analogue or fire-wire sources, and device controlled batch capture was seamless. Similarly, playback off the Media Studio timeline was smooth. Overlay exhibited none of the problems you occasionally find."

"...this Evesham DV Rex-M1 package gives you a complete editing solution that works extremely well."  
James Morris - **Computer VIDEO**



£4249+VAT) **£4992.58**

### canopus DVREX-M1

- The complete DV editing system
- Internal (drive bay) or external breakout box
  - Two Firewire IEEE1394 ports, composite and S-video
  - In and out, component video out
  - Optimised Sony DVBK-1 hardware DV CODEC, no loss of quality
  - Convert existing analogue video to DV
  - High quality, real-time, full-screen preview and to external video monitor
  - DV batch capture. Capture up to 20 minutes in one .AVI file - seamlessly capture longer clips to multiple files
  - Hardware shuttle and jog with wheel mouse, real-time audio and video scrubbing
  - Rex Edit Version 2: now with full range of editing transitions and WYSIWYG titles. Also rendering speed like you wouldn't believe - 1 sec dissolve in about 3 seconds
  - Digital audio in/out (coaxial and optical) with DVREX-M2 option

**DV REX-M1 ALSO AVAILABLE SEPARATELY**  
**£2113.85**

### MovieStation NT

- Specifications as MovieStation 98 with the following differences:
- ATI 8MB Xpert98 AGP 3D graphics accelerator
  - 21" Taxan Ergovision 2160 TC095 DiamondTron monitor
  - Windows NT

£4449+VAT) **£5227.58**

### MovieStation EL

- Specifications as MovieStation 98 with the following differences:
- Single processor capable motherboard
  - 10.2GB Quantum Fireball EX IDE hard disk
  - 8MB ATI Xpert98 AGP 3D graphics
  - 19" Taxan Ergovision 975 TC095 monitor

£3249+VAT) **£3817.58**

**newmedia.com**

"Canopus has made the most of it's hardware with support for native DV audio, simultaneous video previews on the computer screen and video monitor, and the best software integration currently on the PC."  
newmedia.com, DVREX-M1



"DVREX's reliability surpasses any plug-in based solution we've seen. To an editor on deadline, reliability just might be the most elegant feature of all."  
PC Magazine Online (US), DVREX-M1



"this is a professional system that will find happy use in day-to-day editing situations."  
DV Live, DVREX-M1

### Canon XL1 DV camcorder

(£2720+VAT) **£3196**



"this is a brilliant camcorder, which used in most settings will produce outstanding results. It certainly deserves its growing reputation as a DV ground-breaker and should produce a lot of footage of the 'broadcast' variety."



The ideal companion to the MovieStation

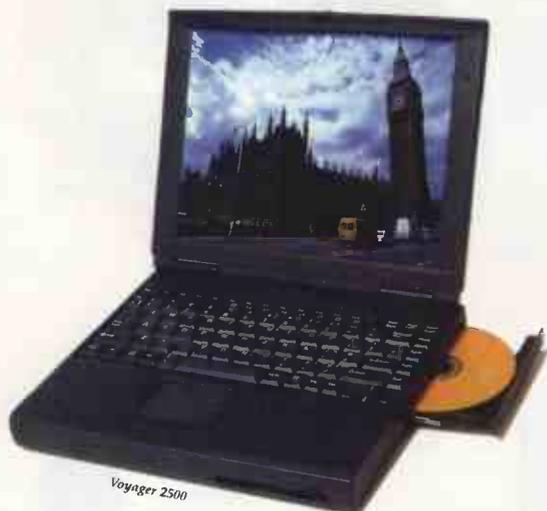
### MovieStation Upgrades

DV-REX M2 option board	(£300+VAT)	£352.50
Upgrade to 256MB RAM	(£160+VAT)	£188.00
32x CD-ROM drive instead of DVD ROM drive	deduct (€40+VAT)	£47.00
DVD-RAM drive instead of DVD-ROM (MovieStation 98 and NT models only)	(£280+VAT)	£329.00
Panasonic CW7582 recordable CD drive with Adaptec Easy CD Creator software (OEM version)	(£165+VAT)	£193.88
Canon XL1 DV camcorder	(£2720+VAT)	£3196.00

# Evesham Vale

BUY NOW  
PAY SEP '99  
SEE PAGE 3 FOR DETAILS

All Voyagers have a 2 year warranty with accidental damage insurance



## Voyager 2500

### Voyager 2500 MULTIMEDIA models:

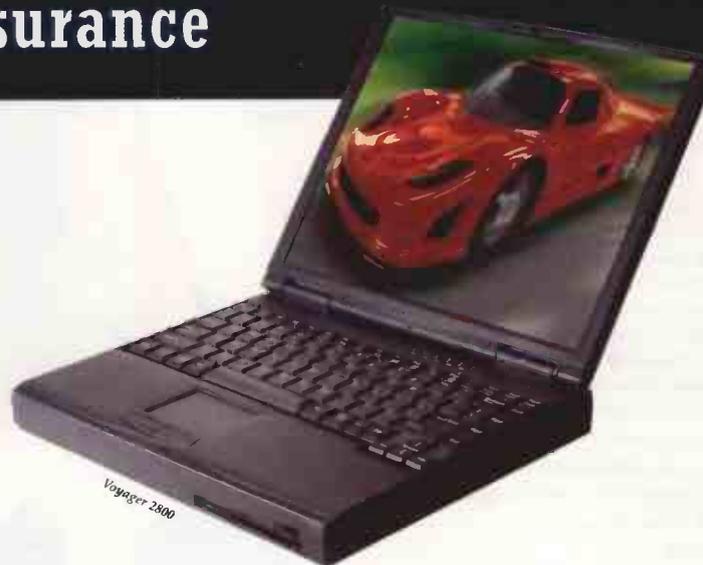
- ◆ 2 year warranty, with accidental damage insurance
- ◆ 256kB asynchronous cache
- ◆ 32MB EDO RAM
- ◆ 5GB hard disk
- ◆ 2MB 64bit PCI graphics accelerator
- ◆ 12.1" TFT colour display with 800x600 SVGA resolution
- ◆ 20x CD-ROM drive
- ◆ 3.5" floppy drive
- ◆ Nickel MetalHydride battery
- ◆ Extensive power management features, including 'suspend to RAM' and 'suspend to disk'

### Voyager 2500 Office models also have:

- ◆ Microsoft Office97 Small Business Edition (see page 2)

### Voyager 2500 - 12.1" TFT display, NiMH battery

	MULTIMEDIA (TFT)	Office (TFT)
AMD K6 300	(£899+vat) £1056.33	(£1029+vat) £1209.08



## Voyager 2800

### Voyager 2800 MULTIMEDIA models:

- ◆ 2 year warranty, with accidental damage insurance
- ◆ Low voltage Intel Mobile Pentium® II processor
- ◆ 13.3" TFT colour display with 1024 x 768 resolution
- ◆ 512kB cache
- ◆ 96MB RAM
- ◆ 5GB hard disk (233/266 models)
- ◆ 6.4GB hard disk (300 models)
- ◆ 24x CD-ROM drive
- ◆ 2MB 64bit PCI graphics accelerator
- ◆ 3.5" floppy drive
- ◆ Nickel MetalHydride battery
- ◆ Extensive power management features, including 'suspend to RAM' and 'suspend to disk'

### Voyager 2800 Office models also have:

- ◆ Microsoft Office97 Small Business Edition (see page 2)

### Voyager 2800 - 13.3" TFT display, NiMH battery

	MULTIMEDIA (TFT)	Office (TFT)
Pentium® II 233	(£1149+vat) £1350.08	(£1279+vat) £1502.83
Pentium® II 266	(£1199+vat) £1408.83	(£1329+vat) £1561.58
Pentium® II 300	(£1349+vat) £1585.08	(£1479+vat) £1737.83

## WHAT PC?

### Testdrive

"When he looked at the Evesham Vale Voyager 2000's specification, Tim found it hard to believe it fell within his budget." "In the end, the EveshamVale Voyager 2000 looked the most promising." EveshamVale Voyager 2000

## WHAT PC?

"quality screen... good colour and contrast: it is also visible from a good range of angles." "The keyboard is comfortable to type on." EveshamVale Voyager 2000



"The Evesham is definitely a bargain and, while other budget notebooks we reviewed may beat some of its features, they invariably do so at the cost of other components - and for more money." EveshamVale Voyager 2800

### Voyager 2000 series also feature:

- ◆ Good solid keyboard with Windows95 keys
- ◆ Built-in touchpad with palm rest
- ◆ Built-in 16bit stereo sound with stereo speakers and microphone
- ◆ ZV-enabled PCMCIA ports for two type II or one type III card
- ◆ 16550 compatible serial port
- ◆ EPP/ECP bi-directional parallel port
- ◆ PS/2 mouse or keyboard port
- ◆ External monitor port (runs simultaneously)
- ◆ Jacks for external speakers and stereo line in
- ◆ Infra red data link
- ◆ Anchor for Kensington security cable
- ◆ Windows98 installed (Windows95 is a no cost option)

### Voyager 2000 series upgrades

32MB to 96MB RAM (2500 models) .....	(£75+vat) £88.13
Car cigar lighter adaptor .....	(£79+vat) £92.83
Second battery .....	(£79+vat) £92.83
EveshamVale 56k PCMCIA modem.....	(£79+vat) £92.83
EveshamVale ethernet adaptor.....	(£59+vat) £69.33



Madrid  
(£30+vat) £35.25



Pisa  
(£85+vat) £76.38

# Evesham Micros

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0800 496 0800

Web: <http://www.evesham.com>



# Evesham Vale



## Prestige

The Prestige offers an entry level solution to your business requirements.

- Intel Celeron™ 333MHz processor
- Intel 440EX AGPset
- 32MB SDRAM
- 4GB hard disk
- ATI 8MB Xpert98 AGP video card
- 15" EveshamVale Monitor

(See page 4 for full details of Prestige models)

**£519+VAT**

### Prestige upgrades

32MB to 64MB RAM .....£40+VAT  
Rack mount case .....£220+VAT



Windows NT 4  
the right choice for business £75+VAT



## Rapier Server

Fast and reliable, the Rapier Server is a real office workhorse. From a modest print and file server to a powerful SBS implementation, the possibilities are endless.

- Intel Pentium® II 400MHz processor (upgradeable to dual processors)
- 128MB high performance RAM
- Safety first – 9GB Ultra Wide SCSI hard disk and dual redundant PSUs
- Dedicated server case for maximum expansion potential
- Delivered and commissioned on-site free of charge

**£2299+VAT**

Evesham Finance example:  
**£82.70+VAT per month\***

### Rapier Server upgrades

P II-400 to dual P II-400 processor .....£279+VAT  
128MB to 256MB RAM .....£160+VAT  
4/8GB DAT drive .....£650+VAT  
12/24GB DAT drive .....£799+VAT



## Samurai RAID Server

Safe, secure and powerful – the Samurai RAID Server uses industry proven technology to give you the peace of mind that comes from knowing that your data integrity will be maintained.

- Intel Pentium® II 400MHz processor (upgradeable to dual processors)
- Maximum data protection with 27GB Ultra Wide RAID 5 hot swappable hard disks
- Handle applications with 128MB high performance RAM
- Delivered and commissioned on-site free of charge

**£3399+VAT**

Evesham Finance example:  
**£122.26+VAT per month\***

### Samurai RAID Server upgrades

P II-400 to dual P II-400 processor .....£279+VAT  
128MB to 256MB RAM .....£160+VAT  
4/8GB DAT drive .....£650+VAT  
12/24GB DAT drive .....£799+VAT



## Evesham Micro

### BUSINESS SALES CENTRE

- Put a face to your business partner with a dedicated account manager
- Local experience and on the spot advice
- Voted best "Product knowledge of sales staff" In Computer Weekly survey
- Local technical support and engineering

Novell. Novell.



Does your network have up to 25 users



Microsoft BackOffice Small Business Server (SBS) helps provide easier ways to run your business

- A reliable and stable network operating system for business applications
- Efficient file and printer sharing between users
- Communicate with colleagues and customers through secure e-mail
- Gain controlled access to the Internet.
- Without the expense and luxury of a full-time IT specialist on the payroll!

Ultimately, SBS combined with an EveshamVale server and the right advice provides the complete solution that makes it easy to grow and manage your company.

From **£999+VAT** for a 5 client license

## Evesham FINANCE

All equipment and services from Evesham Micros can be financed through Evesham Finance.

### Why Evesham Finance?

- Spread the cost of equipment over realistic life
- No large capital outlay
- Payments inflation proof
- Automatic Change Out Options
- 100% tax allowable as a revenue expense
- Specialist Finance solutions for all Businesses and Public sector

For an immediate free consultation call Evesham Finance Helpdesk on **0800 496 0600**

\*Evesham Finance examples are for a 3 year period. This facility is offered subject to status.

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**0800 389 9393**  
Web: <http://www.evesham.com>



# Evesham Micros

## Peripherals

### MOTHERBOARDS

Buy a motherboard and processor together and you get a free heatsink and fan.

Name	Form factor	Processor support			Chipset	Cache	RAM support				Exp. slots			USB	Price
		K6	Pentium	Pentium II			Fast page/EDO	SD	ISA	PCI	AGP				
Chaintech 5T1M	ATX	•	•		430TX	512KB	•	•	•	4"	4"		•	(£45+VAT) £52.88	
Chaintech 6ESA	ATX			•	430EX	on CPU	•	•	•	2"	2"	1	•	(£59+VAT) £69.33	
Chaintech 6LTM-2	ATX			•	440LX	on CPU	•	•	•	2"	4"	1	•	(£61+VAT) £71.68	
Chaintech 6BTM	ATX			•	440BX	on CPU	•	•	•	3"	4"	1	•	(£79+VAT) £92.83	

Note some motherboard features may not work without Windows 98 \*One slot shared \*Use of USB requires cable @ (£5+VAT) £5.88



### CHAINTECH COMPUTER CO., LTD.

**SeePU** Innovative simple CPU installation via BIOS - no jumpers  
**APTC** High security Active Processor Temperature Control - multi-level CPU temperature protection function



SYMBOL OF EXCELLENCE WINNER  
Chaintech 6BTM

### RUN!PC

"Technology Creativity" award.  
Chaintech 5T1M



Tom's hardware guide RECOMMEND  
Chaintech 6BTM

### AnandTech

<b>5T1M</b> "features the spectacular SeePU jumperless CPU setup" "I suggest that you seriously consider the Chaintech 5T1M" Ratings: Performance ★★★★★ Ease of use ★★★★★ Documentation ★★★★★	<b>6ESA</b> "...don't underestimate the power this puppy packs. Its meek bark is made up for by sheer power..." "...you can enjoy the awesome FPU performance of a Celeron/6ESA combo for a previously unheard of price..." AnandTech's website
---	--



Chaintech 6ESA Motherboard, Celeron 333MHz, Cooler & 32MB SDRAM ..... (£199+VAT) £233.83

Windows 98 CD (only available with bundle) ..... (£59+VAT) £69.33

Note - some motherboard features may not be supported without upgrading to Windows 98

## UPGRADE PACKS

Chaintech 6BTM Motherboard, Celeron 333, Cooler, 64MB PC100 SDRAM ..... (£209+VAT) £245.58

Chaintech 6BTM Motherboard, Pentium II-350, Cooler, 64MB PC100 SDRAM ..... (£289+VAT) £339.58

Chaintech 6BTM Motherboard, Pentium II-400, Cooler, 128MB PC100 SDRAM ..... (£469+VAT) £551.08

### CASES WITH POWER SUPPLY

Style	Form factor	Drive bays		Price
		Internal	External	
Desktop	ATX	1x5.25" 2x3.5"	2x5.25" 1x3.5"	(£55+VAT) £64.63
Mini-tower	ATX	3x3.5"	2x5.25" 3x3.5"	(£49+VAT) £57.58

### PROCESSORS

Celeron 333 ..... (£99+VAT) £116.33  
 Pentium II 350 ..... (£159+VAT) £186.83  
 Pentium II 400 ..... (£279+VAT) £327.83

### MEMORY MODULES

8MB 72-pin ..... (£19+VAT) £22.33  
 16MB 72-pin ..... (£35+VAT) £41.13  
 8MB EDO ..... (£18+VAT) £21.15  
 16MB EDO ..... (£34+VAT) £39.95  
 32MB EDO ..... (£69+VAT) £81.08  
 SDRAM DIMMs  
 32MB ..... (£40+VAT) £47.00  
 64MB PC100 ..... (£90+VAT) £105.75  
 128MB PC100 ..... (£170+VAT) £199.75

### 120MB FLOPPY DRIVE

Panasonic LS-120 internal bare drive ..... (£65+VAT) £76.38  
 120MB floppy disk ..... (£14+VAT) £16.45  
 Panasonic 1.44MB floppy disk drive ..... (£15+VAT) £17.63

### STORAGE & BACKUP

**omega ditto tape drives:**  
 Tapes for ditto 2GB ..... 3 pack (£39+VAT) £45.83  
 Tapes for ditto 3.2GB ..... (£25+VAT) £29.38  
**omega ditto Max tape drives:**  
 Tapes for ditto Max 7GB ..... 2 pack (£35+VAT) £41.13  
 10GB Internal ..... (£139+VAT) £163.33  
 10GB external ..... (£169+VAT) £198.58  
 Tapes for ditto Max 10GB ..... (£22+VAT) £25.85  
 All ditto capacities quoted are with 2x compression  
**omega zip drives:**  
 Zip internal drive ..... (£65+VAT) £76.38  
 Zip external drive 'parallel port' ..... (£79+VAT) £92.83  
 Zip external drive 'SCSI' ..... (£80+VAT) £94.00  
 Zip external drive 'USB' ..... (£99+VAT) £116.33  
 Cartridge for zip drive ..... (£10+VAT) £11.75  
 Cartridge for zip drive ..... 6 pack (£40+VAT) £47.00  
 Battery pack for zip drive ..... (£49+VAT) £57.58  
**omega 1GB jaz drives:**  
 Cartridge ..... (£69+VAT) £81.08  
**omega 2GB jaz drives:**  
 internal ..... (£265+VAT) £311.38  
 external ..... (£265+VAT) £311.38  
 SCSI card ..... (£65+VAT) £76.38  
 Cartridge ..... 3 pack (£179+VAT) £210.33

Panasonic Zip internal drive with media ..... (£65+VAT) £76.38

Seagate 120m DAT tape ..... (£25+VAT) £29.38  
 4/8GB internal DAT drive ..... (£650+VAT) £763.75

hp SureStore 12/24GB DAT drive ..... (£799+VAT) £938.83

### HARD DISKS & CONTROLLERS

Optional installation kit (5.25" mounting bracket plus cables) ..... (£10+VAT) £11.75  
**Quantum**  
 Viking II LVD 4.5GB SCSI (3.5") ..... (£235+VAT) £276.33  
 Viking II LVD 9GB SCSI (3.5") ..... (£399+VAT) £468.33  
**Seagate** 1.2GB IDE ..... (£79+VAT) £92.83  
**SAMSUNG** 6.4GB IDE ..... (£105+VAT) £123.83  
 8.4GB IDE ..... (£129+VAT) £151.33  
**Promise** PCI Ultra ATA controller ..... (£49+VAT) £57.58

### MODEMS

### Quality hardware voice modems

Internet access starter pack: Includes full Internet and World Wide Web access software, with first month membership free and 10 hours free on-line time  
 Cables included  
 K56flex units include SuperVoice software  
 v.90 ready

K56flex internal ..... (£49+VAT) £57.58

K56flex external ..... (£59+VAT) £69.33  
 56k PCMCIA (not voice) ..... (£79+VAT) £92.83

ISDN card ..... (£99+VAT) £116.33

Plug & Play 16 bit ISDN card  
 32 bit VxD CAPI 2.0 driver  
 Answering machine  
 Telephone book/call log  
 Telephone through port  
 RVS-COM software for Windows 95/NT provides Microsoft Internet Explorer, Fax group 3 reception/transmission, and E-mail

pace 56 Voice internal ..... (£73+VAT) £85.33  
 56 Voice external (supports UK caller ID) ..... (£95+VAT) £111.33  
 56 Solo ..... (£155+VAT) £182.33

### US Robotics

Sportster 56.6 Flash internal ..... (£84+VAT) £98.33  
 Sportster 56.6 Flash external ..... (£85+VAT) £99.33  
 Sportster Message ..... (£99+VAT) £116.33

All modems include internet connection software with free trial connection period.

### Network Products

Evesham Vale PCI ethernet adaptor ..... (£29+VAT) £34.33  
 PCMCIA ethernet adaptor ..... (£59+VAT) £69.33

Intel Pro 10/100 PCI ..... (£55+VAT) £64.33  
 Pro 10/100 PCI ..... 45 pack (£259+VAT) £304.33  
 10Mbps 5 port hub ..... (£45+VAT) £52.83  
 10Mbps 8 port hub with BNC ..... (£65+VAT) £76.33  
 100Mbps 4 port fast hub ..... (£135+VAT) £158.33  
 100Mbps 8 port fast hub ..... (£245+VAT) £287.33  
 100Mbps 8 port fast hub with 10/100 bridge port ..... (£485+VAT) £569.33  
 10Mbps 8 port switch ..... (£365+VAT) £428.33  
 10Mbps 8 port switch with two 10/100 bridge ports ..... (£499+VAT) £586.33  
 Internet station ..... (£275+VAT) £323.13

The cost effective way to share one internet connection over your 10Base-T network  
 Uses analogy of ISDN modems  
 Use up to two additional modems to share fax services, bulletin board access etc.

hp Jet Direct External Plus 3 ..... (£265+VAT) £311.33

FICON TECHNOLOGY Mobile PCMCIA ..... (£195+VAT) £229.33  
 Diva (PCI) ..... (£115+VAT) £135.33  
 Diva Pro (PCI) ..... (£189+VAT) £222.00  
 Diva terminal adapter ISDN modem (external) ..... (£155+VAT) £182.33  
 Diva server card ..... (£329+VAT) £386.58

### UPSs

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Armada 1700	LAPC63	P233 II	12.1" TFT	32	4.0Gb	24X	WIN 95	£1,145.99	£1,346.54
Armada 1700	LAPC64	P266 II	13.3" TFT	32	4.0Gb	24X	WIN 95	£1,512.99	£1,777.76
Armada 1700	CPQ876E302	P300 II	14.1" TFT	32	5.0Gb	24X	WIN 95	£1,675.99	£1,969.29
Armada 3500	CPQ876E303	P266 II	12.1" TFT	32	4.0Gb	Optional	WIN 95	£1,366.99	£1,606.21
Armada 3500	CPQ876E304	P266 II	12.1" TFT	32	4.0Gb	Optional	WIN NT	£1,410.99	£1,657.91
Armada 3500	CPQ876E313	P300 II	13.3" TFT	32	6.4Gb	Optional	WIN 95	£1,719.99	£2,020.99
Armada 3500	CPQ876E305	P300 II	13.3" TFT	32	6.4Gb	Optional	WIN NT	£1,764.99	£2,073.86
Armada 6500	CPQ876E306	P300 II	14.1" TFT	64	6.4Gb	24X	WIN 95 + 56K MODEM	£2,516.99	£2,957.46
Armada 6500	CPQ876E330	P300 II	14.1" TFT	64	6.4Gb	24X	WIN NT + 56K MODEM	£2,560.99	£3,009.16
Armada 7400	CPQ876E307	P266 II	13.3" TFT	32	4.0Gb	24X	WIN 95	£1,675.99	£1,969.29
Armada 7400	CPQ876E308	P266 II	13.3" TFT	32	4.0Gb	24X	WIN NT	£1,719.99	£2,020.99
Armada 7400	CPQ876E309	P300 II	13.3" TFT	64	6.4Gb	24X	WIN 95	£1,985.99	£2,333.54
Armada 7400	CPQ876E310	P300 II	13.3" TFT	64	6.4Gb	24X	WIN NT	£2,029.99	£2,385.24
Armada 7800	CPQ876A258	P266 II	13.3" TFT	64	5.0Gb	24X	WIN 95	£1,853.99	£2,178.44
Armada 7800	CPQ876A259	P266 II	13.3" TFT	64	5.0Gb	24X	WIN NT	£1,897.99	£2,230.14
Armada 7800	CPQ876C152	P266 II	14.1" TFT	64	8.0Gb	24X	WIN 95	£2,115.99	£2,486.29
Armada 7800	CPQ876C153	P266 II	14.1" TFT	64	8.0Gb	24X	WIN NT	£2,162.99	£2,541.51
Armada 7800	CPQ876E311	P300 II	14.1" TFT	64	8.0Gb	24X	WIN 95	£2,674.99	£3,143.11
Armada 7800	CPQ876E312	P300 II	14.1" TFT	64	8.0Gb	24X	WIN NT	£2,427.99	£2,852.89
HEWLETT PACKARD - NOTEBOOKS									
Omnibook 900	HP943H366	P300 II	12.1" TFT	32	4.0Gb	Optional	WIN 95/98 DUAL BOOT	£1,574.99	£1,850.61
Omnibook 900	HP943H384	P300 II	12.1" TFT	32	4.0Gb	Optional	WIN NT	£1,649.99	£1,938.74
Omnibook 900	HP943H402	P366 II	12.1" TFT	32	6.4Gb	Optional	WIN 95/98 DUAL BOOT	£2,089.99	£2,408.74
Omnibook 900	HP943H435	P366 II	12.1" TFT	32	6.4Gb	Optional	WIN NT	£2,124.99	£2,496.86
Omnibook 2100	HP943C900	P233 II	12.1" TFT	32	4.0Gb	24X	WIN 95	£1,174.99	£1,380.61
Omnibook 2100	HP943C926	P266 II	12.1" TFT	32	4.0Gb	24X	WIN 95	£1,319.99	£1,550.99
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Omnibook 2100	HP943E561	P300 II	13.3" TFT	64	4.0Gb	4X	WIN 95	£1,649.99	£1,938.74
Omnibook 2100	HP943C887	P233 II	12.1" TFT	32	4.0Gb	24X	WIN NT	£1,219.99	£1,433.49
Omnibook 2100	HP943C913	P266 II	12.1" TFT	32	4.0Gb	24X	WIN NT	£1,369.99	£1,609.74
Omnibook 2100	HP943G426	P300 II	12.1" TFT	32	4.0Gb	24X	WIN NT	£1,539.99	£1,809.49
Omnibook 2100	HP943E575	P300 II	13.3" TFT	64	4.0Gb	24X	WIN NT	£1,499.99	£1,997.49
Omnibook 4100	LAPHP56	P266 II	14.1" TFT	32	4.0Gb	24X	WIN 95	£1,014.99	£1,267.61
Omnibook 4100	HP943A266	P266 II	14.1" TFT	32	4.0Gb	24X	WIN 95	£1,869.99	£2,197.24
Omnibook 4100	LAPHP54	P233 II	13.3" TFT	32	4.0Gb	24X	WIN 95	£1,639.99	£1,926.99
Omnibook 4100	HP943D326	P266 II	13.3" TFT	32	4.0Gb	24X	WIN 95	£1,793.99	£2,107.94
Omnibook 4100	HP943A268	P266 II	14.1" TFT	32	4.0Gb	24X	WIN NT	£2,009.99	£2,455.74
Omnibook 4100	HP943A269	P266 II	14.1" TFT	32	4.0Gb	24X	WIN NT	£1,945.99	£2,286.54
Omnibook 4100	HP943A267	P233 II	13.3" TFT	32	4.0Gb	24X	WIN NT	£1,687.99	£1,983.39
Omnibook 4100	HP943D341	P266 II	13.3" TFT	32	4.0Gb	24X	WIN NT	£1,850.99	£2,174.91
Omnibook 4150	HP943E589	P300 II	14.1" TFT	64	6.4Gb	24X	WIN 95	£2,249.99	£2,643.74
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Omnibook 4150	HP943H537	P333 II	14.1" TFT	64	6.4Gb	24X	WIN 95/98 DUAL BOOT	£2,455.99	£2,885.71
Omnibook 4150	HP943H556	P333 II	14.1" TFT	64	6.4Gb	24X	WIN NT	£2,532.99	£2,976.71
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SLVX-30TZ	LAPTW45	P300 II	12.1" TFT	64	4.0Gb	24X	WIN 98	£1,348.99	£1,585.06
SLVX-26TG	LAPTW46	P266 II	13.3" TFT	64	3.1Gb	24X	WIN 98	£1,286.99	£1,512.21
SLVX-30TG	LAPTW47	P300 II	13.3" TFT	64	4.0Gb	24X	WIN 98	£1,406.99	£1,653.21
SLGX-30TK	LAPTW70	P300 II	14.1" TFT	64	4.0Gb	24X	WIN 98	£1,759.99	£2,067.99
SLGX-30TK	LAPTW71	P300 II	14.1" TFT	64	6.4Gb	24X	WIN 98	£1,839.99	£2,161.99
SLGX-D33TK	LAPTW72	P333 II	14.1" TFT	64	6.4Gb	24X	WIN 98	£2,029.99	£2,385.24
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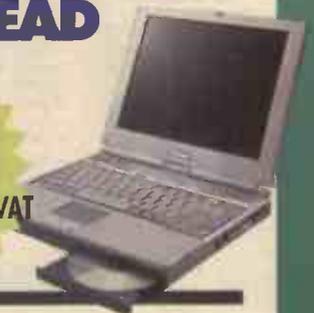
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HP Vectra VL8	HP943C083	Pentium® II 350	NO	32Mb	4.3Gb	NO	512K	MGA-G100 4Mb	Win NT	£822.99	£967.01
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HP Vectra VL8	HP943G067	Pentium® II 400	NO	64Mb	6.4Gb	NO	512K	MGA-G100 4Mb	Win NT	£935.99	£1,099.79
HP Vectra VL8	HP943C078	Pentium® II 400	NO	64Mb	6.4Gb	32X	512K	MGA-G100 4Mb	Win NT	£1,006.99	£1,183.21
HP Vectra VL8	HP943F552	Pentium® II 400	NO	64Mb	6.4Gb	32X	512K	MGA-G200 8Mb	Win NT	£1,127.99	£1,325.39
HP Vectra VL8	HP943E986	Pentium® II 450	NO	64Mb	10.1Gb	32X	512K	MGA-G100 4Mb	Win NT	£1,262.99	£1,484.01
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TYPE	SKU	PROCESSOR	MON	RAM	HDD	CD	CACHE	GRAPHICS	OP/SY	PRICE	INC/VAT
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M6400/CDS	CPQ876C930	333 celeron®	NO	64Mb	6.4Gb	32X	128K	ATI Rage Pro AGP 1X 4Mb	Win NT	£679.99	£798.99
M4300	CPQ876D087	Pentium® II 350	NO	64Mb	4.3Gb	NO	512K	MGA-G200 8Mb	Win 95	£719.99	£845.99
M4300	CPQ876D109	Pentium® II 350	NO	64Mb	4.3Gb	NO	512K	MGA-G200 8Mb	Win NT	£764.99	£898.86
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M10G/CDS	CPQ876E999	Pentium® II 350	NO	64Mb	10Gb	32X	512K	MGA-G200 8Mb	Win 98	£839.99	£986.99
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M10G/CDS	CPQ876C952	Pentium® II 400	NO	64Mb	10Gb	32X	512K	MGA-G200 8Mb	Win 95	£889.99	£1,045.74
M10G/CDS	CPQ876F015	Pentium® II 400	NO	64Mb	10Gb	32X	512K	MGA-G200 8Mb	Win 98	£989.99	£1,163.24
M10G/CDS	CPQ876C974	Pentium® II 400	NO	64Mb	10Gb	32X	512K	MGA-G200 8Mb	Win NT	£1,029.99	£1,210.24

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Equium 7100S	PCTS22	Pentium® II 350	NO	64Mb	4.3Gb	32X	512K	ATI 3D RAGE AGP 2Mb	Win NT	£831.99	£977.59
Equium 7100S	PCTS19	Pentium® II 400	NO	64Mb	4.3Gb	32X	512K	ATI 3D RAGE AGP 2Mb	Win 98	£924.99	£1,086.86
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Equium 7100D	PCTS24	Pentium® II 350	NO	64Mb	4.3Gb	32X	512K	ATI 3D RAGE AGP 2Mb	Win NT	£874.99	£1,028.11
Equium 7100D	PCTS20	Pentium® II 400	NO	64Mb	4.3Gb	32X	512K	ATI 3D RAGE AGP 2Mb	Win 98	£968.99	£1,136.21
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Insight



# cables



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BC30-60	SINGLE DRIVE 60CM	£5.00	£5.88
BC40	2 DRIVES 58CM	£6.00	£7.64

## SCSI III

BC60	SINGLE DRIVE 30CM	£21.00	£24.68
BC70	SINGLE DRIVE 60CM	£24.00	£28.20
BC50	2 DRIVE 90CM	£32.00	£37.60
BC80	3 DRIVE 90CM	£39.00	£45.83
BC90	4 DRIVE 100CM	£59.00	£69.33
BC100	SCSI III/SCSI I ADAPTOR MDB68M/50M	£27.00	£31.73
BC110	SCSI III/SCSI I ADAPTOR MDB68F/50F	£23.00	£27.03

## EXTERNAL SCSI CABLES AND SCSI TERMINATORS - SCSI I

BC115	B25M/CENT 50M 90CM	£10.00	£11.75
BC120	DB25M/CENT 50M 1.8M	£12.00	£14.10
BC130	CENT 50M/CENT 50M 90CM	£10.00	£11.75
BC125	CENT 50M/CENT 50M 1.8M	£13.00	£15.28
BC135	TERMINATOR SINGLE CENT 50M PASSIVE	£7.00	£8.23
BC140	TERMINATOR SINGLE CENT 50M ACTIVE	£12.00	£14.10
BC145	TERMINATOR IN LINE CENT 50M/CENT 50F PASSIVE	£12.00	£14.10
BC150	TERMINATOR IN LINE CENT 50M/CENT 50F ACTIVE	£20.00	£23.50

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BC155	MICRO DB50M/CENT 50M 1.2M	£19.00	£22.33
BC160	MICRO DB50M/CENT 50M 1.8M	£27.00	£31.73
BC165	MICRO DB50M/CENT 50F ADAPTOR	£15.00	£17.63
BC170	MICRO DB50M/MICRO DB50M 1.2M	£23.00	£27.03
BC175	MICRO DB50M/MICRO DB50M 1.8M	£27.00	£31.73
BC180	MICRO DB50M/DB25M 1.2M	£25.00	£29.38
BC185	MICRO DB50M/DB25M 1.8M	£30.00	£35.25
BC190	TERMINATOR MICRO DB50M SINGLE END PASSIVE	£16.00	£18.80
BC195	TERMINATOR MICRO DB50M SINGLE END ACTIVE	£19.00	£22.33

## SCSI III

BC200	SCSI II/SCSI III HDD68M/MICRO DB50M	£35.00	£41.13
BC205	HDD68M/CENT 50M 1.2M	£35.00	£41.13
BC210	HDD68M/CENT 50M 1.8M	£38.00	£44.65
BC215	DB25M/HDD68M 1.2M	£59.00	£69.33
BC220	TERMINATOR MICRO DB68M SINGLE ENDED ACTIVE	£49.00	£57.58

## HIGH QUALITY PARALLEL PRINTER CABLES - ASSEMBLED

BC300	ASSEMBLED 1.8M NON-BIDIRECTIONAL	£3.50	£4.11
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BC310	IBM NOTEBOOK PARALLEL 60CM	£6.50	£7.64
BC315	PREMIUM 1.8M BI-DIRECTIONAL	£7.50	£8.81
BC320	PREMIUM 3M BI-DIRECTIONAL	£8.50	£9.98
BC325	PREMIUM 4.5M BI-DIRECTIONAL	£9.50	£11.16
BC330	PREMIUM 6M BI-DIRECTIONAL	£10.50	£12.34
BC340	PREMIUM 7.5M BI-DIRECTIONAL	£11.50	£13.51
BC345	IEEE 1284 1.8M BI-DIRECTIONAL	£11.00	£12.93
BC350	IEEE 1284 3M BI-DIRECTIONAL	£14.50	£17.04

## HIGH QUALITY SERIAL PRINTER AND MODEM CABLES

BC370	IBM PC/LASERJET CABLE 3M	£8.50	£9.98
BC375	IBM AT/LASERJET CABLE 3M	£8.50	£9.98
BC380	IBM PC/HAYES MODEM CABLE 1.8M	£7.50	£8.81
BC385	IBM PC/HAYES MODEM CABLE 3M	£8.50	£9.98
BC390	IBM AT SERIAL ADAPTOR DB9M/DB25F	£4.50	£5.29
BC395	IBM AT SERIAL ADAPTOR DB9F/DB25M	£4.50	£5.29
BC400	IBM AT/HAYES MODEM CABLE 1.8M	£6.00	£7.05
BC410	IBM AT/HAYES MODEM CABLE 3M	£6.00	£7.05
BC420	NULL MODEM ADAPTOR DB25 M/F	£5.00	£5.88
BC425	INTERLINK/LAPLINK UNIVERSAL SERIAL CABLE 3M	£8.00	£9.40

## MONITOR SIGNAL, POWER AND KEYBOARD CABLES

BC430	LAPTOP KEYBOARD/MOUSE SPLITTER CABLE 6 PIN MINI DIN MALE/2 X 6 PIN MINI DIN FEMALE	£9.00	£10.58
BC435	J/STICK "Y" 1.8M DB15M/2 X DB15 F	£7.50	£8.81
BC440	JOYSTICK EXTENSION DB15 M/F 1.8M	£7.50	£8.81
BC445	IBM PC 5 PIN DIN K/BROD EXT CABLE 1.8M	£6.00	£7.05
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BC456	AT TO PS2 6 PIN MINI DIN MALE	£6.50	£7.64
BC457	PS2 to AT 6 PIN MINI DIN	£6.50	£7.64
BC458	AT MOUSE EXTENSION CABLE	£3.00	£3.53
BC459	PS2 6 PIN DIN KEYBOARD EXT. 3M	£6.00	£7.05
BC490	PS2 6 PIN DIN KEYBOARD EXT. 1.8M	£6.00	£7.05
BC470	AC POWER CABLE EXTENSION 1.8M	£6.00	£7.05
BC475	AC UK POWER CABLE 1.8M	£6.00	£7.05
BC480	VGA MONITOR EXTENSION CABLE 1.8M	£6.00	£7.05
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BC510	25 PIN MALE TO MALE 3M	£7.50	£8.81
BC515	25 PIN MALE TO MALE 4.5M	£8.50	£9.99
BC520	25 PIN MALE TO FEMALE 1.8M	£6.50	£7.63
BC525	25 PIN MALE TO FEMALE 3M	£7.50	£8.81

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BC530	DB25 FEMALE/FEMALE	£4.50	£5.28
BC535	DB25 MALE/MALE	£4.50	£5.28
BC540	DB9 FEMALE/FEMALE	£4.50	£5.28
BC545	DB9 MALE/MALE	£4.50	£5.28

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BC550	IDF DUAL HARD DRIVE CABLE 48CM	£5.00	£5.88
BC555	UNIVERSAL FLOPPY CONTROLLER	£5.50	£6.46
BC560	Y POWER SPLITTER CABLE 5.25"		
	4 PIN MALE / 2 X FEMALE	£3.50	£4.12
BC570	MPC II CD AUDIO CABLE, UNIVERSAL 3 CONNECTOR	£5.00	£5.88

## TOOL KITS

BC650	20 PIECE TOOL KIT	£19.50	£22.91
BC660	36 PIECE TOOL KIT	£37.50	£44.06
BC665	55 PIECE TOOL KIT	£47.50	£55.83
BC666	65 PIECE TOOL KIT	£57.50	£67.57

## PRINTER SWITCH BOXES

BC700	2 POSITION MANUAL SWITCH KIT WITH ALL CABLES TO CONNECT 2 COMPUTERS TO 1 PRINTER	£17.00	£19.98
BC710	2 POSITION MANUAL SWITCH KIT WITH ALL CABLES TO CONNECT 1 COMPUTER TO 2 PRINTERS	£27.50	£32.31

## COMPACT PARALLEL SWITCHES ALLOW 2 OR 4 PCs TO SHARE ONE PRINTER OR CONNECTION OF 1 PC TO 2 OR 4 PRINTERS.

BC720	COMPACT PARALLEL AUTO SWITCH REVERSIBLE 2 POSITION	£25.50	£29.96
BC730	COMPACT PARALLEL AUTO SWITCH REVERSIBLE 4 POSITION	£44.50	£52.29
BC910	HP recommended Bitronics Manual reversible 2-1 switch. Incl. IEEE1284 cable (FUI123-KIT)	£39.00	£45.83
CABC002	BITRONICS AUTO SWITCH KIT 2 PORT	£42.00	£49.35
CABC003	BITRONICS AUTO SWITCH KIT 4 PORT	£75.00	£88.12

## OMNIVIEW

BC915	OmniView 2 port (FD064U)	£139.00	£163.33
BC920	OmniView 4 port (FD066U)	£229.00	£269.08
BC930	OmniView AT cable kit (A3X932U)	£10.00	£11.75
BC940	OmniView PS/2 cable kit (A3X982U)	£10.00	£11.75

## DIGITISERS, KEYBOARDS, JOYSTICKS, MICE

### GRAPHICS TABLETS

DT-D	DABBLER SOFTWARE FOR USE WITH TRUST 18 X 12 DIGITISING	£39.00	£45.83
DT5	TRUST 18 X 12 DIGITISING	£115.00	£135.13
WAC001	WACOM A6 INTOUS GRAPHICS	£115.00	£135.13
WAC002	WACOM A4 INTOUS GRAPHICS	£199.99	£234.99
WAC003	WACOM A4 INTOUS GRAPHICS	£295.99	£347.79
WAC004	WACOM A4 INTOUS GRAPHICS CAD	£329.99	£387.74
DT11	WACOM A5 GRAPHICS TABLET	£188.00	£220.90
DT12	WACOM A4 GRAPHICS TABLET	£279.00	£327.83
DT13	WACOM A3 GRAPHICS TABLET	£479.00	£562.83
DT14	WACOM A2 GRAPHICS TABLET	£1,259.00	£1,479.33

### SERIAL KEYBOARDS

K11	ALPS NEWAYE WIN 95 105 KEY	£10.00	£11.75
K121	TRUST 105 KEYBOARD WIN 95	£11.00	£12.93
K26	TRUST ERGOTRACK KEYBOARD	£19.00	£22.33
K15	CHERRY 6000 UK KEYBOARD	£16.00	£18.80
K16	CHERRY 3000 UK KEYBOARD	£22.00	£25.85
K28	HITSUMI ERGO 105 KEY	£9.00	£10.58
K34	MEDIAFORCE WIN 95 KEYBOARD	£8.00	£9.40
K4	MEDIA FORCE 105 KEY WIN 95	£7.00	£8.23
K36	BTC 7931 WIN 95 HIGH QUALITY	£10.00	£11.75
K37	BTC SPLIT ERGO W95 KEYBOARD	£19.00	£22.33
K38	BTC WIRELESS KEYBOARD W95	£26.00	£30.55
K39	BTC 105 WIN95 MEMBRANE KEY	£9.00	£10.58
K40	BTC ERGONOMIC SOLID KEYBOARD	£16.00	£18.80
K41	BTC 8140 TOUCHPAD KEYBOARD	£20.00	£23.55
K50	KEY TRONIC KT6105	£12.00	£14.10
K51	KEY TRONIC KT2000 WIN 95	£18.00	£21.15
K52	KEY TRONIC TRACKBALL	£42.00	£49.35
K53	KEY TRONIC TOUCHPAD	£59.00	£69.33
K54	KEYTRONIC LIFETIME WIRELESS	£69.00	£81.08
K55	KEYTRONIC LIFETIME WIRELESS	£81.00	£95.18
K30	MICROSOFT NATURAL KEYBOARD	£29.00	£34.08
KEDE001	DIGITAL EDGE CONTROL DECK	£25.00	£29.38

### PS2 KEYBOARDS

CHI2971	CHICONY 2971 WIN95 PS2	£8.99	£10.56
K17	CHERRY G84-4100PPAG8 PS2	£45.00	£52.88
K28-PS2	MITSUMI WIN 95 PS2 KEYBOARD	£10.00	£11.75
K3-PS2	FUJITSU 105 PS2 8725-402	£16.00	£18.80
KECH002	CHERRY WIN 95 105 KEY PS2	£17.00	£19.98

### RODENTS

M10	GENERIC 2 BUTTON SERIAL MOUSE	£2.00	£2.35
M12	HITSUMI HIGH QUALITY SERIAL MOUSE	£5.00	£5.88
M12-PS2	MITSUMI HIGH QUALITY PS2 MOUSE	£5.00	£5.88
M130	ALPS PS2 2 BUTTON MOUSE	£7.00	£8.23
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M110	TRUST AMI-MOUSE 98 PS2/SERIAL	£9.00	£10.58
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M108	TRUST AMI-MOUSE SCROLL PS2/SERIAL	£8.99	£10.56
M109	TRUST AMI-MOUSE SCROLL PRO	£10.99	£12.91
MS803F567	MS WHEEL MOUSE PS2/SERIAL	£14.99	£17.61
M1170	MS HOME MOUSE SERIAL	£15.00	£17.63
M115-R	MS RETAIL BOX MOUSE	£24.00	£28.20
M160	MS INTELLIMOUSE PS2/SERIAL	£31.00	£36.43
MS803G235	MS INTELLIMOUSE USB	£25.99	£30.54
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M161	MS INTELLIMOUSE TRACKBALL	£32.00	£37.60

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DC43	CASIO QV-70 DIGITAL CAMERA	£168.99	£198.56
DC44	CASIO QV-700 DIGITAL CAMERA	£238.99	£280.81
DCA001	CASIO QV-5000SX	£349.99	£411.24
DC41	EPSON PHOTO PC 600	£299.99	£352.49
DC47	EPSON PHOTO PC 700	£361.00	£424.18
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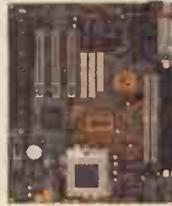


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M222	TX Pro II On board VGA 512K Baby AT	£39.99	£46.99
MBPC7670	INTEL BX BABY AT 8MB VIDEO ON BOARD + SND.100MHZ	£74.99	£88.11
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MBG1004	GA-6LA7 SOCKET 370 AT LX FOR CELERON	£67.99	£79.89
MBG1005	GA-6LMM7 SOCKET 370 LX ATX SOUND/VIDEO	£92.99	£109.26
MBG1006	GA-6LX7A SOCKET 370 ATX LX FOR CELERON	£59.99	£70.49
MBG1002	GA6BXDS DUAL PII BX ATX UW SCSI	£179.99	£211.49
M92-BXE	GA6BXE PENT II BX ATX 100MHz bus	£82.99	£97.51
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MB70-1	P6LX-A+ PII Single Slot 440LX - ATX	£74.99	£88.11
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MOAS005	P2B-D 440BX, ATX Form Factor, Dual Slot 1	£199.99	£234.99
MOAS006	P2B-DS 440BX chipset, ATX Form Factor, On Board SCSI, Dual Slot 1	£319.99	£375.99

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### SOYO

MBS0001	5EHM ETEQ Chipset Baby AT, AGP 1Mb	£69.99	£82.24
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### SUPERMICRO

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MOSH002	SUPERMICRO 370SLM MOTHERBOARD 370SBA SOCKET 370 ATX BX FOR CELERON	£75.99	£89.29
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- Intel LCMD registered utility



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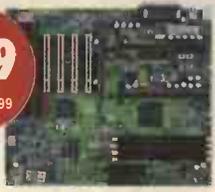
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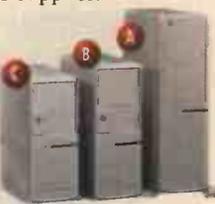
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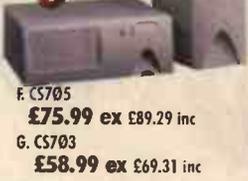


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# Seagate

## IDE hard drives

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HD431-SS	4.3GB	ST34321A	2.5"	10.5MS	5400	UDMA33				£77.49	£91.05
HD641-SU	6.4GB	ST36531A	2.5"	10.5MS	5400	UDMA33				£87.99	£103.39
SG003	6.4GB	ST36422A	2.5"	9.5MS	5400	UDMA33				£89.99	£105.74
HD860-S	8.6GB	ST38641A	2.5"	10.5MS	5400	UDMA33				£108.99	£128.06
HD100-S	10.2GB	ST310240A	2.5"	10.5MS	5400	UDMA33				£124.99	£146.86
HD101-S	10.2GB	ST310230A	2.5"	10.5MS	5400	UDMA33				£129.99	£152.74

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<b>MEDALIST PRO SCSI DRIVES</b>											
HASE004	4.55Gb	Medalist Pro ST34520N	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / NARROW	£139.99	£164.49
HASE003	4.55Gb	Medalist Pro ST34520W	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / WIDE	£139.99	£164.49
HASE005	6.5Gb	Medalist Pro ST36530N	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / NARROW	£179.99	£211.49
HASE006	6.5Gb	Medalist Pro ST36530W	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / NARROW	£179.99	£211.49
HASE007	9.1Gb	Medalist Pro ST39140N	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / NARROW	£244.99	£287.86
HASE008	9.1Gb	Medalist Pro ST39140W	SCSI	9.5ms	512k	7200	3.50	3 Yrs	Ultra SCSI 3 / WIDE	£249.99	£293.74
<b>BARRACUDA SCSI DRIVES</b>											
HASE009	4.55Gb	Barracuda ST34573N	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra SCSI 3 / NARROW	£239.99	£281.99
HASE010	4.55Gb	Barracuda ST34573W	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra SCSI 3 / WIDE	£249.99	£293.74
HASE033	4.55Gb	Barracuda ST34573WC	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra Wide Single Connector	£316.99	£372.46
HASE035	4.55Gb	Barracuda ST34573LW	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Ultra 2 Wide	£279.99	£328.99
HASE036	4.55Gb	Barracuda ST34573LC	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Ultra 2 Wide Single Connector	£319.99	£375.99
HASE037	4.55Gb	Barracuda ST34573FC	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Fiber Channel	£339.99	£399.49
HD911-S	9.1Gb	Barracuda ST39173N	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra SCSI 3 / NARROW	£299.99	£352.49
HD911-SW	9.1Gb	Barracuda ST39173W	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra SCSI 3 / WIDE	£275.99	£324.29
HASE002	9.1Gb	Barracuda ST39173WC	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra Wide Single Connector	£309.99	£364.24
HASE038	9.1Gb	Barracuda ST39173WD	SCSI	7.1ms	512k	7200	3.50	5 Yrs	Ultra Wide Differential	£299.99	£352.49
HASE039	9.1Gb	Barracuda ST39173LW	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Ultra 2 Wide	£299.99	£352.49
HD913-SW	9.1Gb	Barracuda ST39173LC	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Ultra 2 Wide Single Connector	£339.99	£399.49
HASE040	9.1Gb	Barracuda ST39173FC	SCSI	7.1ms	1024k	7200	3.50	5 Yrs	Fiber Channel	£279.99	£328.99
HASE041	18.2Gb	Barracuda ST118273N	SCSI	7.6ms	512k	7200	3.5x1.6	5 Yrs	Ultra SCSI 3 / NARROW	£489.99	£575.74
HASE042	18.2Gb	Barracuda ST118273W	SCSI	7.6ms	512k	7200	3.5x1.6	5 Yrs	Ultra SCSI 3 / WIDE	£519.99	£610.99
HASE043	18.2Gb	Barracuda ST118273WC	SCSI	7.6ms	512k	7200	3.5x1.6	5 Yrs	Ultra Wide Single Connector	£549.99	£646.24
HASE044	18.2Gb	Barracuda ST118273WD	SCSI	7.6ms	512k	7200	3.5x1.6	5 Yrs	Ultra Wide Differential	£629.99	£740.24
<b>CHEETAH SCSI DRIVES</b>											
HASE016	4.55Gb	Cheetah ST34502LW	SCSI	5.2ms	1024k	10,025	3.50	5 Yrs	Ultra 2 Wide	£319.99	£375.99
HASE019	9.1Gb	Cheetah ST39102LW	SCSI	5.2ms	1024k	10,025	3.50	5 Yrs	Ultra 2 Wide	£419.99	£493.49
HASE020	9.1Gb	Cheetah ST39102LC	SCSI	5.2ms	1024k	10,025	3.50	5 Yrs	Ultra 2 Wide Single Connector	£419.99	£493.49
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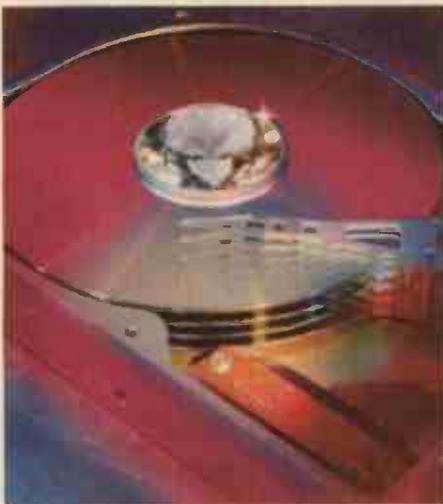
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HAMX017		6.8GB	256K	<9MS	5400	UDMA 33	£114.99	£135.11
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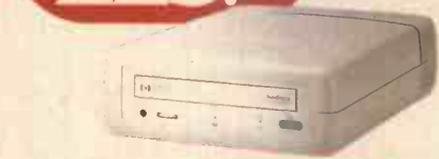
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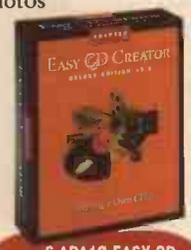


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T62-S	SURESTORE 5000i	£309.99	£364.24
HP943G609	SURESTORE 5000e	£399.99	£469.99
HP943F239	SURESTORE 5000eU	£399.99	£469.99
HP943F240	SURESTORE DAT 8i	£479.99	£563.99
HP943F241	SURESTORE DAT 8e	£554.99	£652.11
HP943D116	SURESTORE T20i 10-20GB SCSI	£259.99	£305.49
HP120E	SURESTORE T20e 10-20GB SCSI	£315.99	£371.29
T24i	SURESTORE DAT 24i	£674.99	£793.11
T24E	SURESTORE DAT 24e	£748.99	£880.06
HP943G605	SURESTORE DAT 24eU	£829.99	£975.24
HP943B210	SURESTORE DAT 24 X 6i AUTOLOADER	£2,013.99	£2,366.44
BAHP002	SURESTORE DAT 24 X 6e AUTOLOADER	£2,000.99	£2,445.16
BAHP005	SURESTORE DLT 40i INT 20/40GB DRIVE	£1,796.99	£2,111.46
DLT140	SURESTORE DLT 40e EXT 20/40GB DRIVE	£1,959.99	£2,302.99
HP943D263	SURESTORE DLT 70i INT 70GB DRIVE	£4,214.99	£4,952.61
DLT170	SURESTORE DLT 70e EXT 70GB DRIVE	£4,319.99	£5,075.99

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LCE1006	DVD RAM EXT SCSI inc ADAPTEC 2902 KIT	£511.99	£601.59
LCE1007	NSR TRAVAN EXT SCSI inc ADAPTEC 2902 KIT	£273.99	£321.94

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SG2750699	HORNET TRAVAN INT 8GB ATAPI	£169.99	£199.74
SG2750707	HORNET TRAVAN INT 8GB SCSI	£193.99	£227.94
SG1000	HORNET TRAVAN NS INT 8GB SCSI	£205.99	£242.04
SG1001	HORNET TRAVAN NS INT 20GB SCSI	£234.99	£276.11

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SG2750496	SCORPION DDS/DC INT 4GB SCSI-2	£378.99	£445.31
SG2750502	SCORPION DDS/DC EXT 4GB SCSI-2	£455.99	£535.79
SG2750498	SCORPION DDS-2 INT 8GB SCSI-2	£455.99	£535.79
SG2750504	SCORPION DDS-2 EXT 8GB SCSI-2	£532.99	£624.26
SG2750753	SCORPION DDS-3 INT 24GB SCSI-2	£597.99	£702.64
SG2750754	SCORPION DDS-3 EXT 24GB SCSI-2	£679.99	£798.99

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SG2750787	SIDEWINDER AIT INT 50GB FW SCSI-2	£1,440.99	£1,693.16
SG2750789	SIDEWINDER AIT EXT 50GB FW SCSI-2	£1,652.99	£1,942.26
SG2750793	SIDEWINDER AIT CARTRIDGE 25/50GB	£61.99	£72.84

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PD225	PD INT IDE DRIVE LF1196AB KIT	£184.99	£217.36
PD330	PD EXT P/PORT DRIVE LF1500PB KIT	£224.99	£264.36
CD205	650MB PD MEDIA	£14.99	£17.61
LF-D10 1E	DVD RAM INT SCSI SCSI LF-D10 1E	£334.99	£393.62
DVDRAM26	DVD 2.6GB MEDIA	£17.99	£21.14
DVDRAM52	DVD 5.2GB MEDIA	£24.99	£29.36
LS-120S	LS120 INT IDE KIT	£59.99	£70.49
T72-PA	ZIP DRIVE INT IDE REATIL KIT	£64.99	£76.36

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TEX40	IDE NEST AND CONTROLLER	£39.99	£46.99
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TEX80	IDE NEST READY ZIP DRIVE	£39.99	£46.99
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T410	POWER MD 230-II - Mac & SCSI	£180.99	£212.66

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T48	TR3	£14.99	£17.61
T48-A	TR4	£18.99	£22.31
T4E-E	VERBATIM TR1 EXTRA 1GB CAP	£14.99	£17.61
T4E-F	VERBATIM TR3 EXTRA 4.4GB CAP	£18.99	£22.31
T49	QIC3080 4GB	£18.99	£22.31
T40	FORMATTED DC2120	£5.99	£7.04
T41	DC2120 XL 350MB	£11.00	£12.93
DLT110	DLT 15/30GB MEDIA	£35.99	£42.29
DLT120	DLT 20/40GB MEDIA	£69.99	£82.24
DD53	DDS-3 CARTRIDGE 5 PACK	£75.99	£89.29

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TF30	MC3000XL DATA	£11.99	£14.09
T43-F	4MM DAT TAPE 90M	£2.99	£3.51
T45-F	4MM DAT 120M (DDS-2)	£7.49	£8.80
DD53F	4MM DAT 125M (DDS-3)	£17.99	£21.14
T43-C	4MM DAT CLEANING	£5.99	£7.04
T44-F	8MM DAT TAPE 112M	£4.99	£5.86
DLT120	DLT MEDIA FOR 20/40GB OR 70GB	£54.99	£64.61
DP128	128MB 3.5" OPTICAL	£5.49	£6.45
DP230	230MB 3.5" OPTICAL	£5.99	£7.04
OP540	540MB 3.5" OPTICAL	£17.49	£20.55
OP640	640MB 3.5" OPTICAL	£17.49	£20.55
OP650	650MB 5.25" OPTICAL	£17.49	£20.55
OP120	1.2GB 5.25" OPTICAL	£23.00	£27.03
OP130	1.3GB 5.25" OPTICAL	£23.00	£27.03
OP260	2.6GB 5.25" OPTICAL	£28.99	£34.06
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TDK5880013	DC4-60M 4MM 1.3GB DATA CTDRGE PC 60M	£3.99	£4.69
TDK5880014	DC8-112M 8MM 2.3GB DATA CTDRGE PC 112M	£3.99	£4.69
TDK5880026	DC2120 120MB MINI DATA CTDRGE MAC/PC	£3.99	£4.69
TDK5880029	DC6250 250MB STNRD DATA CTDRGE MAC/PC	£7.99	£9.39
TDK5880030	DC6150 150MB STANDARD DATA CTDRGE PC	£5.99	£7.04
TDK5880031	MO-120 3.5 128MB MO MAGNETO PC	£3.99	£4.69
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OP640	640MB 3.5" OPTICAL	£17.49	£20.55
OP650	650MB 5.25" OPTICAL	£17.49	£20.55
OP120	1.2GB 5.25" OPTICAL	£23.00	£27.03
OP130	1.3GB 5.25" OPTICAL	£23.00	£27.03
OP260	2.6GB 5.25" OPTICAL	£28.99	£34.06

DATA CARTRIDGES

TF20	2120XL QIC 80 DATA	£7.99	£9.39
TF30	MC3000XL DATA	£11.99	£14.09
T43-F	4MM DAT TAPE 90M	£3.99	£4.69
T45-F	4MM DAT 120M (DDS-2)	£8.99	£10.56
DD53F	4MM DAT 125M (DDS-3)	£17.99	£21.14
T43-C	4MM DAT CLEANING	£5.99	£7.04
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- Drive weight: about a pound
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\*250MB and 100MB capacity where 1MB= 1 million bytes. The capacity reported by your operating system may differ.



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OP35-3	JAZ 1GB DISK THREE PACK	£150.00	£176.25
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MOGE002	K56 EXT. VOICE B APT APPROVED	£46.99	£55.21
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XIR200	Credit card ethernet + 336 Modem 10BaseT/10Base2 CEM-33BC/M	£189.00	£222.08
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A low-cost ISDN only External adaptor, aimed at corporate remote workers and SOHO users.

### MEGAHERTZ 56K GLOBAL PC CARD

- x2™ technology at upto 56Kbps
- Flash DSP/Flash ROM upgradeable
- World Ready approved for use over 250 countries and regions
- Digital line guard



F709  
**£103.00**  
 £121.02

see page 22 for other MegaHertz products



F705-E 56K VOICE FAX  
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F700-P WINMODEM  
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High speed external data/fax modem V90

- Connect to the internet at 56Kbps
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- Send and receive faxes without interrupting your current work session
- Consistently voted best-buy modem
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MOGE002	K56 EXT. Voice BAPT APPROVED	£46.99	£55.21
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- Gold Card Global 56K + FAX also GSM and ISDN upgradeable via optional Upgrade

NETGLOBAL 56K + 10MB £164.99 (£193.86)

ISDN UPGRADE £119.99 +VAT



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PSD5530100	ALCATEL HCI000	£88.99	£104.56
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PSD5530293	ERICSSON 600/700	£88.99	£104.56
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U-A65	Smart-UPS 1400i NET - c/w PowerChute Plus	£352.49	£352.49
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3C900TPO-Etherlink XL PCI UTP only	N140 £31.99	£37.59	N140-5 £139.99	£164.49
3C900-Combo Etherlink XL PCI Combo	N141 £69.99	£82.24	N141-5 £319.99	£375.98
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PC Card with X-Jack connector

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3CM3823089	CARDBUS 10/100MBPS RJ45	£89.99	£105.74
3CM3823130	CARDBUS 10/100MBPS RJ45 5 PACK	£419.99	£493.49
3CM3823131	CARDBUS 10/100MBPS RJ45 20 PACK	£1,599.99	£1,879.99
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3CM3823231	56K MODEM + 10MBPS LAN RJ45	£149.99	£176.24
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NR310	hub/TP16C 16x BNC thin ethernet 3C16702	£99.99	£117.49
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NE3C025	BASELINE DUAL SPEED HUB 12X10/100 TX 3C16592	£361.99	£425.34
NE3C026	BASELINE DUAL SPEED HUB 24X 10/100BASETX 3C16593	£579.99	£681.49
NR240	BASELINE SWITCH 12X10BASET / 2 X10/100 PORTS 3C16460	£359.99	£422.99
NE3C027	BASELINE FAST ETHERNET SWITCH 12X10/100 PORTS 3C16464	£639.99	£751.99
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NETGEAR mixed port switches (SW500) offer cost effective performance by providing one or two 10/100 ports for server attachment or uplinking plus a set of 10Base-T ports for workstation or printer attachment. For the ultimate in performance and flexibility, choose NETGEAR Fast Ethernet Switches (FS100 / FS500) with 10/100 auto-sensing on every port.



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USB004	4 PORT USB ETHERNET HUB 3 USB + 1 ETHERNET PORT	£79.00	£92.82

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USB009	USB TO ETHERNET	£49.00	£57.57



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BC620	BNC 1.8M PATCH	£5.00	£5.88
BC625	BNC 3M PATCH	£7.00	£8.23
BC630	BNC 7.5M PATCH	£10.00	£11.75
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BC825	15m Red	£12.00	£14.10
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NS106	FB108	Fast Ethernet Starter Kit - FE108 + Two FA310TX + Two 25' Cables	£119.99	£140.99
NS107	EB104	Ethernet Starter Kit - EN104 + Two EA201c 10Mbps + Two 2-25' Cables	£44.99	£52.86

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NS120	FA310	10/100Mbps Fast Ethernet TP PCI Card	£22.49	£26.43
NS125	FA310-10	10/100Mbps Fast Ethernet TP PCI Card - 10 pk	£199.99	£234.99
NS130	FA310-50	10/100Mbps Fast Ethernet TP PCI Card - 50 pk	£849.99	£998.74
NS135	FA410	10/100Mbps TP PCMCIA Card	£69.99	£82.24

### NETGEAR ADAPTER CARDS - 10Mbps

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NS115	EA201-10	10Mbps ISA Network Card for PCs - 10 pk	£114.99	£135.11

### NETGEAR HUBS - 10Mbps

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NS145	EN104	4 Port Slimline 10Base-T Ethernet Hub with integrated BNC port ext psu (inc UK220 volt ext power adpt)	£33.99	£39.94
NS150	EN106TP	6 Port Slimline 10Base-T Ethernet Hub ext psu (inc UK220 volt ext power adpt)	£29.99	£35.24
NS152	EN106TP	8 Port Slimline 10Base-T Ethernet Hub ext psu (inc UK220 volt ext power adpt)	£34.49	£40.53
NS155	EN108	8 Port Slimline 10Base-T Ethernet Hub with integrated BNC port or AUI ext psu (inc UK220 volt ext power adpt)	£49.99	£58.74
NS160	EN308	8 Port 10Base-T Ethernet Hub with int power supply BNC and AUI port int psu (inc UK power cord)	£55.99	£65.79
NS170	EN116	16 Port Slimline 10Base-T Ethernet Hub with integrated BNC and AUI port ext psu (inc UK220 volt ext power adpt)	£74.99	£88.11
NS175	EN516	16 Port 10Base-T Ethernet Hub with int power supply BNC and AUI port rack mount int psu (inc UK power cord)	£94.99	£111.61
NS180	EN524	24 Port 10Base-T Ethernet Hub with int power supply BNC and AUI port rack mount int psu (inc UK power cord)	£129.99	£152.74

### NETGEAR HUBS - 100Mbps

NS185	FE104	4 Port Slimline Class II 100Base-TX Fast Ethernet Hub ext psu (inc UK220 volt power adpt)	£59.99	£70.49
NS190	FE108	8 Port Slimline Class II 100Base-TX Fast Ethernet Hub ext psu (inc UK220 volt power adpt)	£99.99	£117.49
NS191	FE116	16 Port Slimline Class II 100Base-TX Fast Ethernet Hub ext psu (inc UK220 volt power adpt)	£195.99	£230.29
NS195	FE508	8 Port 100Base-TX Fast Ethernet Cascade Port Rackmount Stackable Hub int psu (inc UK power cord)	£199.99	£234.99
NS200	FE516	16 Port 100Base-TX Fast Ethernet Cascade Port Rackmount Stackable Hub int psu (inc UK power cord)	£289.99	£340.74

### NETGEAR HUBS - 10/100Mbps

NS204	DS104	4 Port Dual Speed Hub (inc UK power cord)	£74.99	£88.11
NS205	DS108	8 Port Slimline Dual Speed Hub ext psu (inc UK power cord)	£125.99	£148.04
NS210	DS508	8 Port Dual Speed Cascade Port Rackmount Stackable Hub int psu (inc UK power cord)	£225.99	£265.54
NS215	DS516	16 Port Dual Speed Cascade Port Rackmount Stackable Hub int psu (inc UK power cord)	£335.99	£394.79
NS216	DS524	24 Port Dual Speed Cascade Port Rackmount Stackable Hub int psu (inc UK power cord)	£419.99	£493.49

### NETGEAR SWITCHES - MIXED PORT

NNS220	SW108	8 Port Slimline 10Base-T Ethernet Switch ext psu inc	£145.99	£171.54
NS235	SWS10	10 Port Ethernet Switch with eight 10Base-T Ethernet Ports and two speed-sensing 10/100Mbps UTP Ports Rack int psu (inc UK power cord)	£219.99	£258.49
NS240	SWS18	18 Port Ethernet Switch with sixteen 10Base-T Ethernet Ports and two speed-sensing 10/100Mbps UTP Ports Rack int psu (inc UK power cord)	£389.99	£458.24

### NETGEAR SWITCHES - 10/100Mbps

NS245	FS102	2 Port Fast Ethernet Switch speed-sensing ext psu (inc UK220 volt power adpt)	£79.99	£93.99
NS250	FS104	4 Port Fast Ethernet Switch speed-sensing ext psu (inc UK220 volt power adpt)	£175.99	£206.79
NS320	FS108	8 Port Slimline 10/100 auto sensing Switch ext PSU	£245.99	£289.04
NS325	FS308	8 Port 10/100 auto-sensing switch int PSU	£289.99	£340.74
NS330	FS562	6 x 10/100Base-T + 2 x 100meg Fibre Rack Mount Switch Int PSU	£809.99	£951.74
S335	FS566	6 x 10/100Base-T + 6 x 100meg Fibre Rack Mount Switch Int PSU	£1,099.99	£1,292.49
NS340	FS509	8 x 10/100Base-T + 1 x Gigabit ethernet Rack Mount Switch Int PSU	£709.99	£834.24
NS255	FS508	8 Port Fast Ethernet Switch speed-sensing rack mount int psu	£439.99	£516.99
NS260	FS516	16 Port Fast Ethernet Switch speed-sensing rack mount int psu (inc UK power cord)	£699.99	£822.49

### NETGEAR INTERNET ACCESS / ROUTERS

NS280	RT328	128k ISDN Router Multilink PPP, NAT, DHCP, 2 phone ports	£179.99	£211.49
NS285	RH348	128k ISDN Router with features of RT328 + built in 4 port hub	£219.99	£258.49
NS286	RM356	56k V90 IP Router, NAT, DHCP + built-in 4 port hub	£179.99	£211.49
NS290	XW128	128k ISDN Digital Modem with ST interface 2 (A-low) POTS Multilink PPP 2 Analog Ports (inc UK power adpt)	£119.99	£140.99

### NETGEAR PRINT SERVERS

NS295	PS104	10Mbps Print Server 1 x parallel + integrated 4 port hub	£85.99	£101.04
NS300	PS110	10/100Mbps Print Server with 2 parallel ports	£115.99	£136.29



120 SALES LINES OPEN 9am-7pm MONDAY to FRIDAY. 10am-4pm SATURDAY

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Insight

NETWORKS



# MONITORS

ADI			
MNAD002	PROVISTA E33 14"	£95.00	£111.63
MNAD003	PROVISTA E44 15"	£105.00	£123.38
ADI0055	PROVISTA E55 17"	£175.00	£205.63
MO525	MICROSCAN 4P 15"	£119.00	£139.83
MO527	MICROSCAN 5P 17"	£189.00	£222.08
MO522	MICROSCAN 5G 17"	£255.00	£299.63
MO528	MICROSCAN 5GT 17"	£279.00	£327.83
MO19	MICROSCAN 6P 19"	£369.00	£433.58
MO524	MICROSCAN 6G 21"	£549.00	£645.08
MNAD001	MICROSCAN 5T 14" TFT	£649.00	£762.58
MNAD004	MICROSCAN 6L 15" TFT	£699.00	£821.33

BELINEA			
MMO745	104010 14IN CRT 54KHz MPRII DIGITAL	£78.99	£92.81
MNBL018	102010 15IN FST 0.28DP 85KHz MPRII	£89.99	£105.74
MO747	105035 15IN FST 0.28DP 69KHz MPRII	£93.99	£110.44
MNBL006	105046 15IN FST 0.28DP 70KHz TCO95	£107.99	£126.89
MNBL002	105080 15IN FST 0.28DP 70KHz TCO95	£120.99	£142.16
MNBL019	103040 17IN FST 0.26DP 85KHz TCO95	£169.99	£199.74
MNBL004	107060 17IN FST 0.27DP 70KHz TCO95	£184.99	£217.36
MNBL013	107035 17IN FST 0.25DP 85KHz TCO95	£226.99	£266.71
MNBL014	107065 17IN FST 0.26DP 85KHz	£229.99	£270.24
MO750	107050 17IN DIAMONDTRON		
	0.25DP 95KHz TCO 95	£239.99	£281.99
MNBL010	106020 19IN FST 0.26DP 95KHz TCO95	£288.99	£339.56
MNBL015	106070 19IN FST 0.25DP 95KHz		
	ZENITAN TCO95	£335.99	£394.79
MNBL005	108050 21IN FST 0.26DP 95KHz TCO95 BNC	£508.99	£598.06
MNBL016	108015 21IN FST 0.25DP 115KHz TCO95	£609.99	£716.74
MNBL016	101510 15IN TFT FLAT PANEL	£649.99	£763.74

NOKIA			
MO311	NOKIA 4472A 17IN FST 0.26DP	£268.99	£316.06
MO312	NOKIA 447XPRO 17IN TRINITRON	£328.99	£386.56
MNNK001	NOKIA 447X PRO AUDIO 17IN	£348.99	£410.06
MNNK002	NOKIA 446Xs 19IN FST MONITOR	£418.99	£492.31
MO313	NOKIA 446X PRO 19IN FST	£439.99	£516.99
MNNK003	NOKIA 445X PLUS 21IN FST	£664.99	£781.36
MNNK006	NOKIA 500XA 15.1IN TFT PANEL	£779.99	£916.49

SAMSUNG			
SAS105	SM5105 15IN	£109.99	£129.24
MO201	SM500B 15IN	£139.99	£164.49
MO204	SM7005 17IN	£188.99	£222.06
MO205	SM700P 17IN	£285.99	£336.04
MO206	SM1000P 21IN	£707.99	£831.89
SA320TFT	SM320TFT 13.3IN TFT PANEL	£599.99	£704.99
SA400TFT	SM400TFT 14.1IN TFT PANEL WITH AUDIO	£649.99	£763.74
SA520TFT	SM520TFT 15IN TFT PANEL	£719.99	£845.99
SA720TFT	SM720TFT 17IN TFT PANEL	£1,899.99	£2,232.49
SAB00TFT	SM800TFT 18IN TFT PANEL	£2,599.99	£3,054.99

SONY			
MO410	MULTISCAN 100ES 15IN	£149.99	£176.24
MO411	MULTISCAN 100GST 15IN	£209.99	£246.74
MO413	MULTISCAN 120AS 15IN	£239.99	£281.99
MO412	MULTISCAN 200ES 17IN	£269.99	£317.24
MO409	MULTISCAN 200GST 17IN	£299.99	£352.49
MO415	MULTISCAN 220AS 17IN	£324.99	£381.86
MO414	MULTISCAN 200PST 17IN	£379.99	£446.49
MNSY001	MULTISCAN 400PST 19IN	£479.99	£563.99
MO406	MULTISCAN 20SEH 20IN	£689.99	£810.74
MO416	MULTISCAN 500PST 21IN	£749.99	£881.24

VIEWSONIC			
MO800	E641 14IN MONITOR	£83.99	£98.69
MO801	E655 15IN MONITOR	£108.99	£128.06
MO48-1	E771 17IN FST 0.27DP	£194.99	£229.11
MNVW001	G653 15IN	£160.99	£189.16
V56524146	GA655 15IN MULTIMEDIA	£155.00	£182.13
MO33-1	G771 17IN FST 0.27DP	£220.00	£258.50
MO811	GS771 17IN MONITOR	£220.00	£258.50
MNVW002	GA771 17IN 0.27MM	£280.00	£329.00
MO808	GT775 17IN	£295.00	£346.63
MO49-1	G790 19IN 0.26DP	£395.00	£464.13
MO807	G800 20IN	£585.00	£687.38
MO33-2	P655 15IN	£135.00	£158.63
MO44-1	P775 17IN FST 0.25DP	£299.00	£351.33
MO809	PT775PRO 17IN	£345.00	£405.38
V58920050	PS790 19IN 0.25DP SUPERCLEAR	£435.00	£511.13
MO803	P810 21IN	£675.00	£793.13
MO806	PT813 21IN	£685.00	£804.88
MO805	P815 21IN	£815.00	£957.63
MO813	VPA145 14.5IN LCD	£685.00	£804.88
V58920051	VP150 15IN LCD	£765.00	£898.88
MNVW003	VPA150 15IN LCD	£835.00	£981.13

LIGHTWARE PROJECTORS			
LWR800	VP800 800X600 300 LUMENS SVGA	£1,499.99	£1,762.49



Turn on your imagination

## SCAN 50 15"

- Flat-square CRT with Invar alloy shadow mask to ensure colour stability at sustained high brightness levels.
- Improved front-panel, MPU-based on-screen user controls.
- 1280 x 1024 @ 60 Hz non-interlaced maximum addressable resolution. Fine 0.28 mm dot pitch
- Integrated tilt and swivel base
- 3 Year Warranty 1st year on site



MT5630067 SCAN50  
**£126.99**  
£149.21

MITSUBISHI			
MMT5630067	MITSUBISHI SCAN 50 15in FST	£126.99	£149.21
MNM1002	MITSUBISHI SCAN 70 17in FST	£189.99	£223.24
MNM1013	MITSUBISHI PLUS 71 17in Diamondtron	£255.99	£300.79
MNM1005	MITSUBISHI PLUS 72 17in Diamondtron	£298.99	£351.31
MNM1006	MITSUBISHI PRO 700 17in Diamondtron	£364.99	£428.86

## PLUS 71 17" DIAMONDTRON

- Compact 17" DIAMONDTRON™ monitor with 16" viewable area & on-screen menu
- Super-fine 0.25mm grille pitch with a maximum resolution of 1280 x 1024 @ 60Hz
- Meets latest environmental & safety standards including VESA, MPR-II, Energy Star & TCO95.
- 3 Year Warranty 1st year on site



MNM1013 PLUS71  
**£255.99**  
£300.79

MITSUBISHI			
MNM1012	MITSUBISHI SCAN 90 19in	£370.99	£435.91
MTS630075	MITSUBISHI PRO 900E 19IN 0.28DP Diamondtron	£419.99	£492.49
MNM1007	MITSUBISHI PRO 91TXM 21in Diamondtron	£651.99	£766.09
MNM1009	MITSUBISHI PRO1010 21in Diamondtron	£814.99	£957.61
MNM1011	MITSUBISHI LXAS20W 15.1in TFT	£744.99	£875.36



## 1555E/ML510

CRT Size/Viewable 15"/13.8"  
Dot Pitch (mm) 0.28mm  
CRT Type FST  
Max. Resolution 1024x768@70Hz  
Rec. Resolution 800x600@90Hz  
Special Features MPRII, CE

MO614 1555E/ML510  
**£99.00**  
£116.33

MITSUBISHI			
CTXS300052	1451E/VL400 14IN 0.28DP 1024X768	£85.00	£99.88
MO614	1555E/ML510 15IN 0.28DP 1024X768	£99.00	£116.33
CTXS300053	1569SE/VL500 15IN 0.28DP 1280X1024	£105.00	£123.38
MO609	1569ME/MS500 15IN 0.28DP 1280X1024 SPEAKERS	£135.00	£158.63

## CTX Executive Exchange Service



A 3 year on site warranty for all CTX customers.



## 1792UA/PR710T

CRT Size/Viewable 17"/16"  
Dot Pitch (mm) 0.25mm  
CRT Type Trinitron®  
Max. Resolution 1600x1200@75Hz  
Rec. Resolution 1280x1024@85Hz  
Special Features MPRII, CE, TCO 95

CTXS300055  
**£309.00**  
£363.08

MITSUBISHI			
MO611	1569UA/PR500 15IN 0.25DP 1280X1024 TRINITRON	£150.00	£176.25
CTXS300054	1769SE/VL700 17IN 0.28DP 1280X1024	£169.00	£198.58
MO615	1769MS/MS700 17IN 0.28DP 1280X1024 SPEAKERS	£240.00	£282.00



## 1769SE/ML700

CRT Size/Viewable 17"/15.7"  
Dot Pitch (mm) 0.28mm  
CRT Type FST  
Max. Resolution 1280x1024@65Hz  
Rec. Resolution 1024x768@90Hz  
Special Features MPRII, CE

CTXS300054  
**£169.00**  
£198.58

MITSUBISHI			
MO613	1792SE/VL710 17IN 0.26DP 1600X1200	£235.00	£276.13
CTXS300063	1795UAT/PR711T 17IN 0.25DP TRINITRON	£279.00	£327.83
CTXS300057	VL710ST 17IN 0.26DP 1600X1200 SHORT LENGTH	£265.00	£311.38
CTXS300049	1995UED/VL950T 19IN 0.26DP 1600X1200	£335.00	£393.63
MO607	2085XE/EX800 20IN 0.28DP 1600X1200	£549.00	£645.08



## 1995UE/ML950T

CRT Size/Viewable 19"/18"  
Dot Pitch (mm) 0.26mm  
CRT Type High Contrast FST  
Max. Resolution 1600x1200@75Hz  
Rec. Resolution 1280x1024@90Hz  
Special Features MPRII, CE, TCO 95

CTXS300049  
**£345.00**  
£405.38

MITSUBISHI			
MO608	2185XE 21IN 0.26DP 1600X1200	£681.00	£800.18
MO618	2195XE/EX1100 21IN 0.26DP 1600X1200	£736.00	£864.80
MO619	CTX PANOVUE 540 10.4 LCD	£499.00	£586.33
MO620	CTX PANOVUE 600 12.1 LCD	£599.00	£703.83
MO621	CTX PANOVUE 745 14.5 LCD	£599.00	£703.83

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both open 9am-6pm monday to friday

general enquiries **0870 700 7030**

**iiyama**  
a visible difference

**VISIONMASTER 450 19"**

- 19" (18" viewable) high contrast FST
- 1600x1200@80Hz
- 0.26 dot pitch
- Reduced emissions
- Anti-reflect/anti glare/antistatic coating
- 3Yrs warranty



M0112 450  
**£399.00**  
£468.83

**VISIONMASTER PRO 400**

- 17" Diamondtron.
- Anti-reflect/antistatic coating
- 1600x1200 @75Hz
- 0.25 aperture grille
- 3Yrs warranty



MN11002 PRO400  
**£299.00**  
£351.33

IIYAMA			
M0105	MF8515G VISION MASTER 350 15in	£119.00	£139.83
MN11006	S702GT VISION MASTER 17in	£229.00	£269.08
MN11001	S701GT VISION MASTER 400 17in	£259.00	£304.33
MN11002	A701GT VISION MASTER PRO 400 17in Diamondtron	£299.00	£351.33
M0108	MF8617ES VISION MASTER 17ES 17in SPEAKERS	£349.00	£410.08
M0112	S901GT VISION MASTER 450 19in	£399.00	£468.83
MN11005	A901GT VISION MASTER PRO 450 19in NFT	£435.00	£511.13

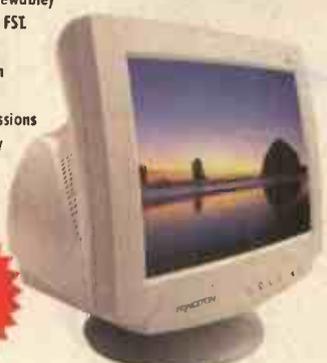
M0120	S101GT VISION MASTER 501 21in	£645.00	£757.88
MN11003	A101GT VISION MASTER PRO 501 21in Diamondtron	£645.00	£757.88
MN11004	S102GT VISION MASTER 502 21in	£669.00	£786.08
M0119	A102GT VISION MASTER PRO 502 21in Diamondtron	£669.00	£786.08
MN11008	PROLITE 36 TXA3611HT 14.1in TFT FLAT PANEL	£575.00	£675.63
MN11007	PROLITE 36 HIGH CONTRAST TXA3602GT 14in TFT	£765.00	£898.88
MN11009	PROLITE 38 TXA3811HT 15in TFT FLAT PANEL	£765.00	£898.88
MN11010	PROLITE 38 TXA3821HT 15in USB AUDIO	£795.00	£934.13

All iiyama monitors come with 3yr warranty, 1st yr On-Site, 2nd & 3rd RTB, or upgrade to VisionCare warranty, 3yr On-Site

**PRINCETON®**  
Enhance your image.

**PRINCETON EO505 15"**

- 15" (13.8" viewable) high contrast FST
- 1280x1024
- 0.28 dot pitch
- TC095
- Reduced emissions
- 3Yrs warranty



PG5011 EO505  
**£94.99**  
£111.61

**PRINCETON EO705 17"**

- 17" high contrast FST
- 1280x1024 maximum resolution
- 0.27 dot pitch
- TC095
- 30-70KHz
- 3Yrs warranty



PG5012 EO705  
**£149.99**  
£176.24

**FREE DELIVERY**  
on this item\*

**PRINCETON EO900 19"**

- 19" (18" viewable) high contrast FST
- 1600x1200
- AART™ (advanced Anti-reflection Technology)
- 0.26 dot pitch
- TC095
- 3Yrs warranty



PG5007 EO900  
**£299.99**  
£352.49

PRINCETON			
PG5011	EO505 15in 0.28DP FST	£94.99	£111.61
PG5003	E0500/95 15" 0.28DP FST 1024x768 @87Hz	£124.99	£146.86
PG5012	E0705/95 17in 0.27DP FST TC095*	£149.99	£176.24
PG5004	E0710/95 17" 0.26DP FST 1024x768 @87Hz	£184.99	£217.36
PG5005	E075 TCO 17" 0.26DP FST 1280x1024 @85Hz	£209.99	£246.74
PG5007	E0900/95 19" 0.26DP FST 1280x1024 @85Hz	£299.99	£352.49
PG5008	C2001 21" 0.28DP DIAMONDTRON 1600x1200@85Hz	£499.99	£587.49
PG5009	ARCADIA AR2.7 29" 800x600 NI PRESENTATION	£529.99	£622.74
PG5010	DP5500 14" TFT INC 4MB AGP ATI LCD VIDEO CARD	£579.99	£681.49

\* FREE DELIVERY ON THIS MONITOR. † HARGRAVE TECHNOLOGY APPLE SET PRICED.

**PHILIPS BRILLIANCE®**  
HIGH RESOLUTION MONITORS

**PHILIPS 107S - 17"**

- 17"(15.9"Viewable)
- Black Matrix CRT with AGAS coating
- 0.28 dot pitch
- 1024x768 @ 85Hz
- Digital OSD



PH1107S  
**£169.99**  
£199.74

PHILIPS			
PPH1104B	104B 14IN 0.28DP CRT MONITOR	£84.99	£99.86
MOPO2	105S 15IN 0.28DP FST DIGITAL OSD	£104.99	£123.36
PH1107S	107S 17IN 0.28DP FST 1024x768@85Hz	£169.99	£199.74

**PHILIPS 107MB - 17"**

- 17"(15.9"Viewable)
- Black Matrix CRT with AGAS coating
- 0.28 dot pitch
- 1024x768 @ 85Hz
- Digital OSD
- With speakers



MOPO3 107MB  
**£269.99**  
£317.24

MOP03	107MB 17IN 0.26DP FST 1280X1024@80Hz	£269.99	£317.24
PH107MP	107MP 17IN 0.26DP FST 1280X1024@85Hz	£349.99	£411.24
PH12018	2018 21IN 0.26DP FST	£799.99	£939.99
PH151AXB	151AX 15IN TC095 TFT PANEL	£599.99	£704.99

**ADI the display specialists**  
MICROSCAN P SERIES



MO525 15" 4P  
**£119.00**  
£139.83

MO527 17" 5P  
**£189.00**  
£222.08

ADI SP2000 - SPEAKERS FOR ALL P SERIES MONITORS	£16.00 + VAT	
MNAD002	PROVISTA E33 14"	£95.00 £111.63
MNAD003	PROVISTA E44 15"	£105.00 £123.38
MO525	MICROSCAN 4P 15"	£119.00 £139.83
MO527	MICROSCAN 5P 17"	£189.00 £222.08
MO522	MICROSCAN 5G 17"	£255.00 £299.63

Warranty - All ADI MicroScan monitors come with a 3 year on site warranty. ProVista monitors come with 2 years on site and a third year RTB. Warranty upgrades are available

**Belinea**  
MONITORS BY MAXDATA

MARKET LEADER IN EUROPE

**BELINEA 105035**

- 15-inch FST
- Max Res 1280 x 1024@60Hz, 1024 x 768@85 Hz flicker free
- RT Dot Pitch 0,28 mm Shadow Mask
- Antireflection Coating SILICA
- Emission Standard: MPR II
- 3 Year on site warranty



MO747 105035  
**£93.99**  
£110.44

BELINEA			
MOM0745	104010 14IN CRT 54KHz MPRII DIGITAL	£78.99	£92.81
MO747	105035 15IN FST 0.28DP 69KHz MPRII	£93.99	£110.44
MNBLO06	105046 15IN FST 028DP 70KHz TC095	£107.99	£126.89
MNBLO02	105080 15IN FST 0.28DP NAKAMICHI	£120.99	£142.16
MNBLO07	107020 17IN FST 0.28DP 70KHz TCO 95	£154.99	£182.11
MNBLO09	107040 17IN FST 0.26DP 85KHz TC095	£189.99	£223.24
MNBLO12	107025 17IN FST 0.27DP 70KHz TC095	£182.99	£215.01
MNBLO04	107060 17IN FST 0.27DP NAKAMICHI	£189.99	£223.24
MNBLO13	107035 17IN FST 0.25DP 85KHz TC095	£222.99	£262.01
MNBLO14	107065 17IN FST 0.26DP NAKAMICHI	£233.99	£274.94

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## EPSON EPL-5700 THE IDEAL SMALL WORKGROUP LASER PROVIDING A RAPID 8 PPM

- 8ppm with 100MHz RISC processor for fast, efficient printing
- 4Mb RAM as standard - upgradeable to 36Mb with standard memory SIMMs
- Parallel & Serial interfaces as standard
- 1 Year RTB Warranty with Optional Epsonover Plus for 3 Year On Site warranty

LAEP001 EPL-5700  
**£236.00**  
£277.30



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## EPSON EPL-N1600 A RAPID 16 PAGES PER A4 LASER PRINTER

- Fast 16ppm printing for demanding workgroup applications
- Powerful 150MHz processor ensures excellent productivity
- Superb 1200 dpi class printing with Epson's unique MicroGray and BiRTech printing technology

EP2353747 EPL-N1600  
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LAEP001	EPL-N5700	LASER PRINTER	£236.00	£357.20
FREE	STYLUS COLOR 440			
EP2353496	EPL-N5700EN	LASER PRINTER	£373.00	£538.15
FREE	STYLUS COLOR 440			
EP2353497	EPL-N5700PS	LASER PRINTER	£373.00	£538.15
FREE	STYLUS COLOR 440			
EP2353747	EPL-N1600	LASER PRINTER	£596.00	£700.30
FREE	STYLUS COLOR 640			
EP2353749	EPL-N1600T	LASER PRINTER	£716.00	£841.30
FREE	STYLUS COLOR 640			
EP2353751	EPL-N1600ENT	LASER PRINTER	£835.00	£981.13
FREE	STYLUS COLOR 640			
PR126	EPL-N2000 AA/A3	LASER PRINTER	£945.00	£1,110.38
FREE	STYLUS COLOR 640			
PR127	EPL-N2000PS	POSTSCRIPT PRINTER	£1,193.00	£1,401.78
FREE	STYLUS COLOR 640			
PR-E80	EPL-N4000	LASER PRINTER	£1944.00	£2284.20
FREE	STYLUS COLOR 640			
PR-E85	EPL-N4000T	LASER PRINTER	£3629.00	£4264.08
FREE	STYLUS COLOR 640			
PR-E90	EPL-C8000EN	LASER PRINTER	£3983.00	£4680.03
FREE	STYLUS COLOR 740			
PR-E95	EPL-C8000ENT	LASER PRINTER	£4663.00	£5479.03
FREE	STYLUS COLOR 740			

After you buy your laser printer from Insight, return the voucher from inside the box to Epson with the serial number of your laser printer before May 28th 1999 and Epson will send you their EPSON Stylus Color Inkjet, absolutely FREE!!  
Please note: this offer is only applicable to purchases made in the U.K. or the Republic of Ireland.

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- Designed for ease of use - ideal for first time buyers
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- New full function Status Monitor
- FREE PhotoQuality Paper Pack
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- Advanced Dual Cartridge Ink System
- New Printer Driver Enhancements
- Fast Print Speeds
- 1 Year RTB Warranty



PR-E20 COLOR 440  
**£89.00**  
£104.58

### EPSON STYLUS COLOR 640

1440DPI PHOT-REAL OUTPUT WITH NO HIDDEN EXTRAS UTILISES EPSON PERFECT PICTURE IMAGING SYSTEM™

- 1440dpi colour & true black printing with EPSON Super MicroDot™
- EPSON PhotoEnhance 3 for optimised Digital Images
- FREE NEW "PerfectPicture Pak" Home Creativity software bundle
- FREE PhotoQuality Paper Pack
- High quality output on all media types
- Advanced Dual Cartridge Ink System
- New Printer Driver Enhancements
- New full function Status Monitor
- Windows 95 & 98
- 1 Year RTB Warranty with option to extend to 3 Years

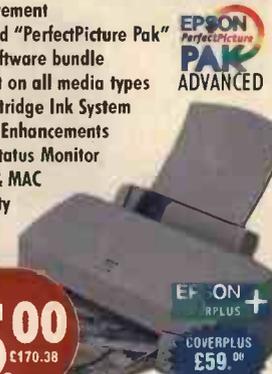


PR-E25 COLOR 640  
**£118.00**  
£138.65

### EPSON STYLUS COLOR 740

ADVANCED 1440DPI WITH VARIABLE SIZED DROPLET TECHNOLOGY - EPSON ULTRA MICRODOT™

- EPSON Ultra MicroDot™ - the world's smallest ink droplet in black and colour
- 1440dpi with Variable Sized Droplet Technology
- 40% Speed Improvement
- FREE NEW Advanced "PerfectPicture Pak" Home Creativity software bundle
- High quality output on all media types
- Advanced Dual Cartridge Ink System
- New Printer Driver Enhancements
- New full function Status Monitor
- Win95, 98, NT4.0 & MAC
- 1 Year RTB Warranty with option to extend to 3 Years



PR-E30 COLOR 740  
**£145.00**  
£170.38

### EPSON STYLUS PHOTO 750

HIGHEST QUALITY PHOTO PRINTER FOR EVERYDAY PRINTING NEEDS

- EPSON Ultra MicroDot™
- 1440dpi with Variable-sized Droplet Technology
- 1440dpi printing on plain paper
- Enhanced print speed for photos, graphics and text
- Optimised photo quality
- EPSON PhotoEnhance™3 for Instant Image Enhancer
- High capacity dual ink cartridges for volume printing
- Parallel, USB, MAC serial, Type B
- Built in parallel and USB ports
- Win 95/98, NT4.0, DOS & MAC
- 1 Year RTB warranty
- iMAC compatible as standard



PR-E35 PHOTO 750  
**£177.00**  
£207.98

### EPSON STYLUS PHOTO 1200

HIGHEST QUALITY A3+ PHOTO PRINTER FOR PROFESSIONALS

- EPSON Ultra MicroDot™
- 1440dpi with Variable-sized Droplet Technology
- 1440dpi printing on plain paper
- Enhanced print speed for photos, graphics and text
- A3+ Photo quality printing
- EPSON PhotoEnhance™3 for Instant Image Enhancer
- High capacity dual ink cartridges for volume printing
- Parallel, USB, MAC serial, Type B
- Built in parallel and USB ports
- Win 95/98, NT4.0, DOS & MAC
- 1 Year RTB warranty
- iMAC compatible as standard



PR-E45 PHOTO 1200  
**£295.00**

#### EPSON PRINTERS & CONSUMABLES - FREE DELIVERY ON PRINTERS

PR18	LX-300 9PIN 80 COLUMN	£97.00	£113.98
PR-E1	FX-880 9PIN 80 COLUMN	£247.00	£290.23
PR192	FX-1170 9PIN 136 COLUMN	£200.00	£235.00
PR193	DFX-5000+ 9PIN 136 COLUMN	£1,226.00	£1,440.55
PR194	DFX-8000+ 9PIN 136 COLUMN	£1,911.00	£2,245.43
EP2353662	DFX-8500+ 9PIN 136 COLUMN	£1,799.00	£2,113.83
PR196	LQ-300 24PIN 80 COLUMN	£115.00	£135.13
PR197	LQ-570+ 24PIN 106 COLUMN	£216.00	£253.80
PR-E3	LQ-670 24PIN 106 COLUMN	£230.00	£270.25
PR198	LQ-870 24PIN 80 COLUMN	£377.00	£442.98
PR199	LQ-2070 24PIN 136 COLUMN	£330.00	£387.75
PR128	LQ-2170 24PIN 136 COLUMN	£468.00	£549.90
PR201	DLQ-3000+ 24PIN 136 COLUMN	£791.00	£929.43
PR114	STYLUS COLOR 440	£89.00	£104.58
PR112	STYLUS COLOR 640	£118.00	£138.65
PR-E6	STYLUS COLOR 740	£207.00	£243.23
PR-E6	STYLUS COLOR 850	£267.00	£314.23
PR-E40	STYLUS COLOR 900	£261.00	£306.68
PR-E5	STYLUS PHOTO 700	£177.00	£207.98
PR-E4	STYLUS PHOTO EX	£308.00	£361.90
PR-E35	STYLUS PHOTO 750	£177.00	£207.98
PR-E45	STYLUS PHOTO 1200	£315.00	£370.13
PR115	STYLUS COLOR 1520 A2	£451.00	£529.93
PR119	STYLUS COLOR 3000 A2	£920.00	£1,081.00
PR-E10	STYLUS PRO 5000 A3	£1,587.00	£1,864.73
CT-E15	BLACK CARTRIDGE FOR PHOTO 700/EX	£13.99	£16.44
CT-E25	BLACK CARTRIDGE FOR STYLUS 850/1520	£14.99	£17.61
EP2353596	BLACK CARTRIDGE FOR STYLUS 740	£12.99	£15.26
CT-E20	COLOUR CARTRIDGE FOR STYLUS 850/1520	£13.99	£16.44
CT-E24	COLOUR CARTRIDGE FOR PHOTO 700/EX	£10.99	£12.91
EP2353650	CLR CARTRIDGE FOR STYLUS 440/640/740	£13.99	£16.44
EP2353595	BLACK CARTRIDGE FOR STYLUS 440/640	£10.99	£12.91
PA1	100 X EPSON 360 DPI A4 PAPER	£6.00	£7.05

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# Expanding Possibilities

## HP DESKJet 695C

Vibrant life-like images & crisp black text.

The versatile HP DeskJet 695C brings professional communications capabilities to the home or the office. Produce reports, brochures, proposals, financial charts and graphs, banners, labels and more.



## HP DESKJet 895Cxi



Professional photo quality imaging & photo performance to increase productivity & efficiency

The new HP DeskJet 895Cxi professional series printer sets your business apart. It gives you professional performance for a clear advantage - with high impact reports, graphs, spreadsheets and posters.

- photo quality colour printing on a wide range of media
- Increased print speeds of up to 10ppm (Black) - 8ppm (Black with colour)
- Sharp and crisp text with HP pigmented black ink.



## HP DESKJet 710C



The flexible partner that gives you great results with no hassle.

The HP DeskJet 710C printer is your flexible partner for all your personal projects. It is versatile and delivers Photo quality printing straight out of the box. It is easy to be creative with the DeskJet 710C as it prints on a wide variety of media including plain and premium paper

- Photoquality imaging out of the box - without swapping cartridges
- Easy to set up and hassles free operation



## HP DESKJet 880C



The dynamic partner that handles every job from business documents to photo printing.

- Up to 8ppm MONO, 5ppm COLOUR
- Up to 600dpi
- PhotoRet II for photo quality
- Parallel and USB interfaces
- Easy to set up and hassles free operation



## HP 2000C



HP2000C/CN Professional series with breakthrough colour printing speed

The HP Professional Series printers enhance your business performance and image with breakthrough color print speed, substantial cost savings, and brilliant photo quality on any paper - setting a new business standard for color printers.

- Black: 600dpi colour: PhotoRet II for photo quality
- 150 sheet paper tray (2000C)
- 250 sheet paper tray, HP Direct 300X print server (2000CN)



## HP LASERJet 1100

The personal laser printer for business users

Ideal for business users in Microsoft® Windows®, DOS or OS/2 environments who want the convenience & confidentiality of a desktop laser printer. The HP LaserJet 1100 printer offers up to 8ppm print speed, superior flexibility, optional network capability, & HP's proven laser technology for reliable performance year after year.



Print/copy/scan with the LaserJet 1100A



## HP LASERJet 2100

Great looking documents, enhanced productivity & room to grow

Take high-resolution laser print quality, versatile paper handling and 8 ppm print speed driven by a fast processor. Add expandability, attractive pricing and what you get is the HP LaserJet 2100 printer, delivering outstanding value from the market leader in laser printing for the office.

- 6 pages per minute
- 18 sec for first page
- 600 x 600dpi
- MicroFine toner
- Sharp text, crisp graphics



LASERJET 2100		
PR-HP60 HP LaserJet 2100 printer	£423.00	£497.03
PR-HP65 HP LaserJet 2100M printer	£480.00	£564.00
PR-HP70 HP LaserJet 2100TN printer	£600.00	£705.00

## HP LASERJet 4000



Bringing significant technology improvements to workgroup laser printing

From paper handling to print quality HP has completely redesigned the best selling HP LaserJet5 printer based on customer needs. You'll find a superior network printing solution that includes industry leading HP JetDirect 600N print servers and HP Web JetAdmin printer management software. The absolute best in network printing. All 4000 series printers are Postscript 1200dpi, 17PPM printers.



### HEWLETT PACKARD PRINTERS & OFFICEJETS - FREE DELIVERY

PR-HP1 DJ	420 COLOUR	£66.00	£77.55
PR120 DJ	340 COLOUR PORTABLE	£144.00	£169.20
PR66 DJ	340Cbi (infrared) COLOUR PORTABLE	£159.00	£186.83
PR-HP3 DJ	710C	£134.00	£157.45
PR58 DJ	720C	£141.00	£165.68
PR-HP6 DJ	895Cxi	£186.00	£218.55
PR-HP01 DJ	1120C	£285.00	£334.88
PR-HP20	LaserJet 1100	£232.00	£272.60
PR-HP25	LaserJet 1100A (with scanner)	£285.00	£334.88
PR-HP60	HP LaserJet 2100 printer	£423.00	£497.03
PR-HP65	HP LaserJet 2100M printer	£480.00	£564.00
PR-HP70	HP LaserJet 2100TN printer	£600.00	£705.00
PR-HP4	LaserJet 2000C	£450.00	£528.75
PR-HP5	LaserJet 2000CN	£675.00	£793.13
PR411	LaserJet 4000	£741.00	£870.88
PR443	OJ 635	£296.00	£347.80
LAPHP01	LJ 3100 PRINTER-FAX-COPIER-SCANNER	£471.00	£553.43
CT110	BLACK CARTRIDGE FOR DJ 310/320/340	£13.99	£16.44
CT105	CLR CARTRIDGE FOR DJ 820/870/890/1100	£16.99	£19.96
CT102	BLK FOR DJ 820/720/870/1600/1150	£15.99	£18.79
CT118	CLR CARTRIDGE FOR DJ 720	£18.99	£22.31
CT157	TONER CARTRIDGE FOR LJ 5P/5MP/6P/6MP	£39.99	£46.99
CT150	TONER CARTRIDGE FOR LJ 5L/6L	£30.99	£36.41
CT119	TONER CARTRIDGE FOR LJ 4000	£48.99	£57.56
COHP001	TONER CARTRIDGE FOR LJ 5000	£79.99	£93.99

\*Mainland UK only

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PRINTERS - HP

# FREE DELIVERY ON ALL PRINTERS\*

PRINTERS

## Canon

Brighten Up your  
Homework and all  
your Work At Home

PAN2422288	CANON BJC 50	£189.00	£222.08
PR-61	CANON BJC 80	£139.00	£163.33
PR615C	CANON BJC80 WITH SCANNING MODULE	£185.00	£217.38
PR-72	CANON BJC 250	£71.00	£83.43
CAN2422871	CANON BJC 2000	£89.00	£104.58
PR-73	CANON BJC 4300	£89.00	£104.58
PR735C	CANON BJC4300 WITH SCANNING MODULE	£122.00	£143.35
CAN2422872	CANON BJC 4400 PHOTO	£112.00	£131.60
PR-86	CANON BJC 4650	£194.00	£227.95
PR865C	CANON BJC4650 WITH SCANNING MODULE	£235.00	£276.13
CAN2422632	CANON BJC 5000	£169.00	£198.58
PR-98	CANON BJC 5500	£405.00	£475.88
CAN2422870	CANON BJC 6000	£162.00	£190.35
PR-69	CANON BJC 7000	£175.00	£205.63
CAN2422869	CANON BJC 7100	£199.00	£233.83

### Canon BJC 2000



CAN2422871  
**£89.00**  
£104.58

The flexible colour  
printer for the home  
or office.

**FREE DELIVERY**  
on this  
item\*

The BJC-2000 printer is a new addition to the successful range of Canon Bubble Jet printers. 30% smaller than the BJC-4300, but based on the same engine, it includes some exciting new developments in print technology. The BJC-2000 is the flexible colour printer for the home, which will meet every home user's printing requirements.

- Supports a wide range of media including paper, transparencies, Glossy paper and back print film.
- Produces high quality photographic reproduction using the optional BC-22e Photo Cartridge.

### Canon BJC 4400 Photo



**FREE DELIVERY**  
on this  
item\*

The affordable desktop printer  
for the home or office.

The BJC 4400 Photo is a new  
addition to the Canon range.  
The Canon BJC 4400 Photo  
is the affordable photo  
quality printer for home and office use.

- High quality 720 x 360 dpi colour printing ensures professional colour documents that have more impact.
- Image Optimiser technology - improves the quality of low resolution images.
- Stunning photographic output using the optional BC-22e Photo Cartridge.
- Includes BC-22e Photo cartridge, Media samples and MGI Photosuite II.

CAN2422872  
**£112.00**  
£131.60

### HL-820

**brother.**

The robust, low cost Windows dedicated  
printer. Ideal for SOHO use

- Up to 8ppm
- Windows dedicated printing
- 600dpi print resolution
- 200 sheet paper input
- Semi-automatic double-sided printing
- Intelligent sleep mode



**FREE DELIVERY**  
on this  
item\*

LABR001  
**£159.00**  
£186.83

LABR001	HL 820 8ppm Laser	£159.00	£186.83
LABR002	HL 1040 8ppm Laser	£179.00	£210.33
LABR003	HL 1050 10ppm Laser 4mb	£209.00	£245.58
8R05830512	HL 1050 10ppm Laser 8mb	£225.00	£264.38
LABR004	HL 1070 10ppm dual bin Laser 4mb	£275.00	£323.13
8R05830513	HL 1070 10ppm dual bin Laser 8mb	£289.00	£339.58
PR283	HL 1660e 8mb Laser 16ppm 1200x600dpi	£579.00	£680.33
PR284	HL 1660e 8mb Laser 16ppm 1200x600dpi	£779.00	£915.33
PR285	HL 1660e 16mb 16ppm Laser 1200x600dpi	£795.00	£934.13
8R05830516	HL 2060n 8mb 20ppm Laser 1200x600dpi	£639.00	£750.83
8R05830518	HL 2060n 16mb 20ppm Laser 1200x600dpi	£655.00	£769.63
8R05830520	HL 2060n 8mb 20ppm Laser 1200x600dpi	£859.00	£1,009.33
8R05830521	HL 2060n 16mb 20ppm Laser 1200x600dpi	£875.00	£1,028.13
PR281	HL2400c Colour Laser	£1,549.00	£1,820.08
PR282	HL2400cn Colour Laser	£1,849.00	£2,172.58

### HL-1040

The flexible high quality entry level laser printer  
for all your printing needs

- Up to 10ppm
- Windows & direct DOS printing
- 600dpi print resolution
- 2Mb Standard memory
- 200 sheet paper input
- Semi-automatic double-sided printing
- Intelligent sleep mode
- C4 envelope printing
- Auto e-mail printing†
- Network connectivity option
- Low running costs
- Easy change consumables



**FREE DELIVERY**  
on this  
item\*

LABR002  
**£179.00**  
£210.33

†win95/POP 3 required

### HL-1070

The high performance dual bin laser printer  
combining high speed output with advanced  
paper handling

- Up to 10ppm
- Dual bin as standard
- 1200dpi class print resolution
- 4Mb Standard memory - exp to 36Mb
- PCL6 emulation
- PostScript level2 language emulation standard
- Semi-automatic double-sided printing
- Intelligent sleep mode
- Multiple emulations
- Auto e-mail printing†
- Network connectivity option
- Low running costs
- USB interface\*\*

**FREE DELIVERY**  
on this  
item\*

LABR003  
**£275.00**  
£323.13

†win95/POP 3 required

\*\*win98 only

## MINOLTA PagePro 8

The Minolta PagePro 8 is equipped with  
PCL6 for ease of use, performance and  
quality. It can handle a variety of media and  
formats - ideal for SOHO use. Its new fan-less  
operation ensures an undisturbed  
working environment.



MLTB810144 PAGEPRO 8  
**£245.00**  
£287.88

**FREE DELIVERY**  
on this  
item\*

MINOLTA - FREE DELIVERY ON ALL PRINTERS			
PR-M1	PAGEPRO 6L	£169.00	£198.58
PR-M2	PAGEPRO 6	£215.00	£252.63
PR-M4	PAGEPRO 12	£559.00	£656.83
PR-M5	PAGEPRO 20	£709.00	£833.08
PR-M6	COLOR PAGEPRO	£1549.00	£1820.08
MLTB810143	PAGEPRO 8L	£205.00	£240.88
MLTB810144	PAGEPRO 8	£245.00	£287.88
MLTB810145	PAGEPRO 8e	£319.00	£374.83

## KYOCERA

### FS-600

True 6ppm speed from this robust, low cost printer  
that's ideal as a personal or shared printer, offering  
low cost modular upgrade options and a low cost per  
printed page.

KYOCERA - FREE DELIVERY ON ALL PRINTERS

PR-K30	Kyocera FS-600	£229.00	£269.08
LAKY001	Kyocera FS-800	£339.00	£398.33
PR-K50	Kyocera FS-1700+	£494.00	£580.45
PR-K25	Kyocera FS-3700+	£679.00	£797.83
PR-K36	Kyocera FS-7000	£1699.00	£1996.33
PR-K45	Kyocera FS-6700	£999.00	£1173.83



**FREE DELIVERY**  
on this  
item\*

PR-K50 FS-1700+  
**£494.00**  
£580.45

\*Mainland UK only

## PRINT LEXMARK



LEXMARK - FREE DELIVERY ON ALL PRINTERS

### INKJET

INLX005	COLOUR JETPRINTER 1100	£75.00	£88.13
INLX006	COLOUR JETPRINTER 3200	£112.00	£131.60
PR-L16	COLOUR JETPRINTER 5700	£139.00	£163.33
LEX4512067	OPTRA 40	£279.00	£327.83
LEX4512068	OPTRA 40N	£425.00	£499.38
INLX002	OPTRA 45	£589.00	£692.08
INLX003	OPTRA 45N	£939.00	£1,103.33

### MONO LASER

PR-L5	OPTRA E+	£209.00	£245.58
PR-L9	OPTRA ES	£269.00	£316.08
LALX001	OPTRA S 1255	£625.00	£734.38
LALX002	OPTRA S 1255N	£799.00	£938.83
LALX003	OPTRA S 1855	£709.00	£833.08
LEX4511954	OPTRA S 1855 N	£909.00	£1,068.08
LEX4511955	OPTRA S 2455	£1,239.00	£1,455.83
LEX4511956	OPTRA S 2455 N	£1,569.00	£1,843.58
LEX4512043	OPTRA K 1220	£459.00	£539.33
LEX4512237	OPTRA 3455	£1,459.00	£1,714.33
LEX4512238	OPTRA 3455N	£1,699.00	£1,996.33

### DOT MATRIX

LEX4511017	2380	£269.00	£316.08
LEX4511018	2361	£329.00	£386.58
LEX4511019	2390	£269.00	£316.08
LEX4511020	2391	£329.00	£386.58
LEX4511280	4227	£1,099.00	£1,291.33

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# SCANNERS UMAX

## ASTRA 1220U

Sizzling performance from this fantastically priced entry level desktop scanner.

- Affordable, professional quality scanning
- 36bit colour scanning
- 600 x 1200 dpi
- Single pass colour CCD



UMX1220U ASTRA 1220U  
**£99.00**  
£116.33



## POWERLOOK II

Superb fast colour scanner for graphic designers

- A4 flatbed
- 600x1200dpi
- 36bit 3.3d
- single pass with 7 second preview
- scsi interface
- comes with scsi card magicscan, binuscan and photoperfect advanced

UMAX			
UMX1220P	ASTRA 1220P FLATBED	£84.00	£98.70
SC122-U	ASTRA 1220S FLATBED	£125.00	£146.88
UMX1220U	ASTRA 1220U FLATBED	£99.00	£116.33
UMX0011	POWERLOOK II INC TRANNY ADAPTOR	£699.00	£821.33

UMX0011 POWERLOOK II  
**£699.00**  
£128.08



## ASTRA 1220S

The Astra 1220 desktop scanner was created for those looking for an easy, affordable way to obtain professional quality scans at a very competitive price.

- Affordable, professional quality scanning
- 36bit colour scanning
- 600 x 1200 dpi
- Max Res. 9600 x 9600
- FREE bundled software PhotoDeluxe & PageManager

SC122U ASTRA 1220S  
**£125.00**  
£146.88

## HP HEWLETT PACKARD

### HP ScanJet 3200

HP's best ever scanner deal!

- Parallel interface
- 600x1200dpi
- 9600dpi interpolated
- copies via PSTL printer destination (Win95/98)
- Software includes Precision Scan Lite Adobe Photodeluxe II



HP943H107 SCANJET 3200  
**£79.00**  
£92.63

<b>HEWLETT PACKARD</b>			
HP943H107	SCANJET 3200	£79.00	£92.63
HP943C981	SCANJET 4100C	£116.00	£136.30
HP943H109	SCANJET 4200	£149.00	£175.08
HP943H867	SCANJET 5200C	£156.00	£183.30
HP6200C	SCANJET 6200C	£237.00	£278.48
HP943C980	SCANJET 6250C	£277.00	£325.48
SC157	PHOTOSMART SCANNER	£323.00	£379.53
HP943F173	DIGITAL SENDER 9100C	£1,979.99	£2,326.49

## visioneer PAPERPORT 3000

Superb value for money from this 300 x 600 dpi, 30bit scanner.

- Affordable, professional quality scanning
- 30bit colour scanning
- 300 x 600 dpi
- Single pass colour CCD
- FREE bundled software PaperPort, Web Publishing Kit Xerox TextBridge, Corex CardScan PictureWorks PhotoEnhancer™ Quicken ExpensAble SE, Connectix QuickCards™ LE

SC V25  
**£67.00**  
£78.73

<b>VISIONEER</b>			
SCV1001	PAPERPORT 6000g A4 FLATBED	£129.00	£151.58
VSN9400115	PAPERPORT 6100B 1200DPI 36BIT	£129.00	£151.58
SCV1003	PAPERPORT ONE TOUCH	£149.00	£175.08
VSN9400121	PAPERPORT ONE TOUCH 5300	£99.99	£117.49
SC-V25	PAPERPORT 3000	£67.00	£78.73
VSN9400096	PAPERPORT 3100 300DPI 30BIT	£67.00	£78.73
VSN9400118	PAPERPORT 3100B	£67.00	£78.73
SC-V25	PAPERPORT STROBE	£139.00	£163.33
SC-V40	PRO OCR 100 SOFTWARE	£59.00	£69.33
SC-V15	PAPERPORT DELUX SOFTWARE	£59.00	£69.33
SCV1002	VISUAL EXPLORER SOFTWARE	£59.00	£69.33
VSN9400116	PAPERPORT SCANNING SUITE INC P/PORT DELUX + PROOCR	£79.00	£92.83

## visioneer PAPERPORT Strobe

THE SMALLEST FASTEST COLOUR SCANNER IN THE WORLD!

With PaperPort Strobe you can organise, edit, fax, e-mail and publish using the worlds most popular paper management software.

Simply drag & drop your scanned documents to & from your desktop.

Simple!



SC-V25 STROBE  
**£139.00**  
£163.33

<b>ACER</b>			
SC215	VUEGOSCAN 310P 4800DPI FLATBED	£47.00	£55.23
SC230	VUEGOSCAN 310U 4800DPI FLATBED	£59.00	£69.33
SC210	VUEGOSCAN 310S 4800DPI FLATBED	£65.00	£76.38
ACE620P	VUEGOSCAN 620P 9600DPI FLATBED	£69.00	£81.08
SC225	VUEGOSCAN 610S 9600DPI FLATBED	£99.00	£116.33
ACE610PT	VUEGOSCAN 610PT INC TRANNY ADAPTOR	£129.00	£151.58
ACE620ST	VUEGOSCAN 620ST INC TRANNY ADAPTOR	£149.00	£175.08

<b>AGFA</b>			
AGF4080496	SNAPSCAN1212P 600X1200PPI	£97.99	£115.14
AGF4080489	SNAPSCAN 1212U 600X1200PPI USB	£115.99	£136.29
AGF4080493	SNAPSCAN 1236S 600X1200PPI	£132.99	£156.26
AGF4080492	SNAPSCAN 1236S ARTLINE 600X1200PPI	£165.99	£195.04
AGF4080329	SNAPSCAN 600 SCS1	£175.00	£205.63
SC-A40	SNAPSCAN 600 ARTLINE SCS1	£214.99	£252.61
SC-A34	SNAPSCAN 600 TRANSPARENCY ADAPTOR	£107.99	£126.89

<b>CANON</b>			
SC-C10	CANOSCAN 300 INC SCS1 CARD	£129.99	£152.74
SC-C20	CANOSCAN 600 INC SCS1 CARD	£489.99	£575.74
CAN320	CANOSCAN320P	£71.99	£84.59
CAN620	CANOSCAN 620P	£95.99	£112.79

<b>MEDIAFORCE</b>			
SC65	COLOUR HAND HELD SCANNER	£9.99	£11.74
SCME002	SCANMAGIC 9600DPI 30BIT A4 FLATBED	£39.99	£46.99

<b>NIKON</b>			
SCN1005	COOLSCAN III WITH NIKON SCAN 2.1 PHOTOSHOP LE	£509.00	£598.08

<b>PLUSTEK</b>			
SC-P5	OPTICPRO A3 30BIT FLATBED	£269.99	£317.24
SC-P10	FBIH 30BIT A4 FLATBED	£49.99	£58.74
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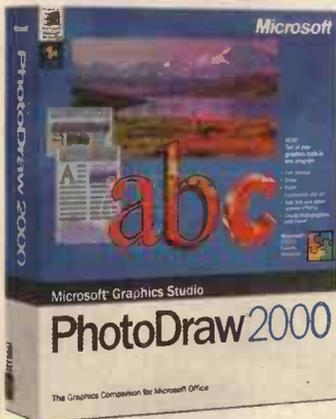
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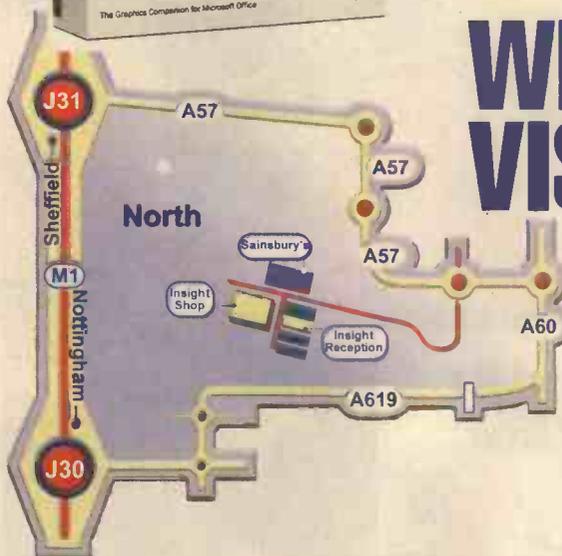


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Virgin	×	×	✓	×	×	✓	£122.45	£122.45	£122.45
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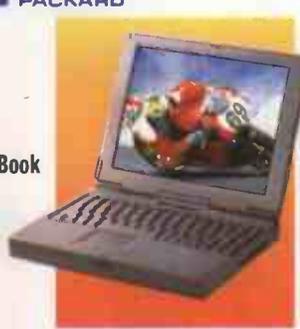
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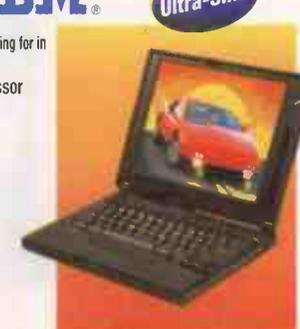
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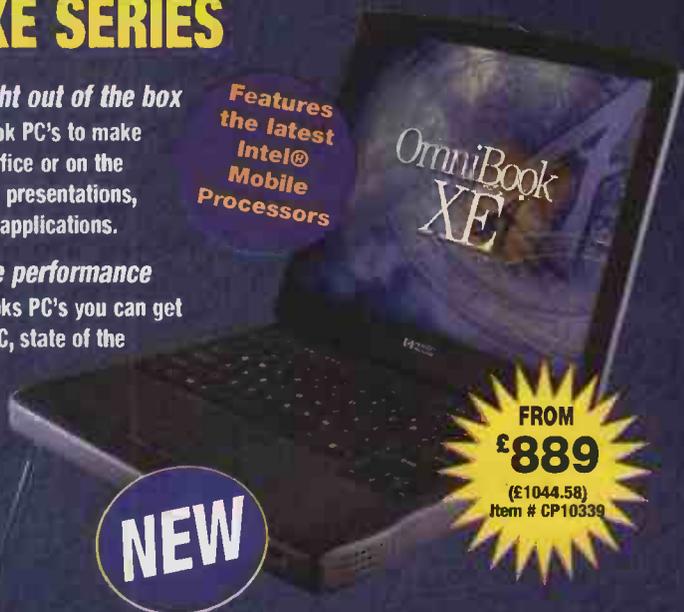
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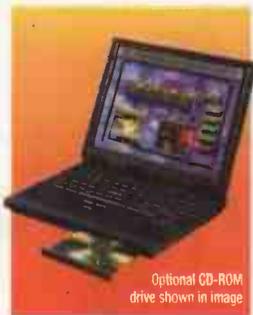
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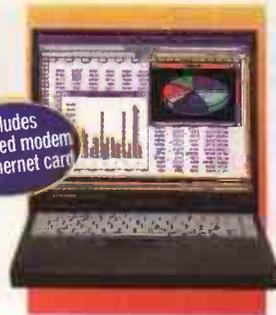
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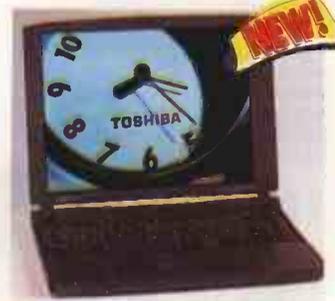
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RAM	Speed	Layout	Order No.	New Sell	Inc. VAT
8MB	70ns	2 x 32	EURMY1249	£13.95	£16.39
8MB	60ns	2 x 32	EURMY1250	£12.95	£15.22
16MB	70ns	4 x 32	EURMY1252	£33.95	£39.89
16MB	60ns	4 x 32	EURMY1253	£31.95	£37.54
32MB	70ns	8 x 32	EURMY1254	£61.95	£72.79
32MB	60ns	8 x 32	EURMY1293	£61.95	£72.79
64MB	70ns	16 x 32	MY11306	£109.95	£129.19
64MB	60ns	16 x 32	MY11305	£109.95	£129.19

## 168-pin 100MHz (PC100) SDRAM DIMMs

RAM	Speed	Layout	Order No.	New Sell	Inc. VAT
32MB	8ns	4 x 64	MY9369	£38.95	£45.77
64MB	8ns	8 x 64	MY9370	£78.95	£92.77
128MB	8ns	16 x 64	MY9371	£156.95	£184.42
256MB	8ns	32 x 64	MY9301	£465.95	£547.49

## 168-pin 66MHz SDRAM DIMMs

RAM	Speed	Layout	Order No.	New Sell	Inc. VAT
16MB	10ns	2 x 64	MY6590	£19.95	£23.44
32MB	10ns	4 x 64	MY6589	£38.95	£45.77
64MB	10ns	8 x 64	MY7504	£77.95	£91.59
128MB	10ns	16 x 64	MY8004	£145.00	£170.38

## COMPAQ - DESKTOPS

Order No.	Model	Size	Quantity	Price (each)	Inc. VAT
MY6590	DeskPro 2000/4000 166, 200	16MB	1	£19.95	£23.44
MY6589	DeskPro 2000/4000 166, 200	32MB	1	£38.95	£45.77
MY7504	DeskPro 2000/4000 166, 200	64MB	1	£77.95	£91.59
MY6590	DeskPro 2000/4000 233 (Pentium w/ MMX)	16MB	1	£19.95	£23.44
MY6589	DeskPro 2000/4000 233 (Pentium w/ MMX)	32MB	1	£38.95	£45.77
MY7504	DeskPro 2000/4000 233 (Pentium w/ MMX)	64MB	1	£77.95	£91.59
MY9289	DeskPro 6000 Pentium II w/MMX	64MB	1	£96.95	£113.92
EURMY1555	Deskpro EN/EP 6266, 6300, 6333	16MB	2	£29.95	£35.19
EURMY1643	Deskpro EN/EP 6266, 6300, 6333	32MB	2	£56.95	£66.92
MY9369	Deskpro EN/EP 6350, 6400	32MB	1	£38.95	£45.77
MY9370	Deskpro EN/EP 6350, 6400	64MB	1	£78.95	£92.77

## IBM - NOTEBOOKS

Order No.	Model	Size	Quantity	Price (each)	Inc. VAT
MY6361	ThinkPad 365 X Models(X & XD)	16MB	1	£27.95	£32.84
MY7606	ThinkPad 365 X Models(X & XD)	32MB	1	£42.95	£50.47
MY6361	ThinkPad 380/D, 385	16MB	1	£27.95	£32.84
MY7606	ThinkPad 380/D, 385	32MB	1	£42.95	£50.47
EURMY0868	ThinkPad 365C/CS/CD/CSD; 365E/ED	16MB	1	£37.95	£44.59
MY6361	ThinkPad 560E, ThinkPad 760 E/EL/ELD	16MB	1	£27.95	£32.84
MY7606	ThinkPad 560E, ThinkPad 760 E/EL/ELD	32MB	1	£42.95	£50.47
MY6361	ThinkPad 760XD, 760XL, 765D, 765L	16MB	1	£27.95	£32.84
MY7606	ThinkPad 760XD, 760XL, 765D, 765L	32MB	1	£42.95	£50.47
MY10749	Thinkpad 770	32MB	1	£58.95	£69.27
MY8895	Thinkpad 770	64MB	1	£109.95	£129.19
MY10749	Thinkpad 600	32MB	1	£58.95	£69.27
MY8895	Thinkpad 600	64MB	1	£109.95	£129.19
MY7606	Thinkpad 380	32MB	1	£42.95	£50.47
MY7633	Thinkpad 380	64MB	1	£81.95	£96.29

## TOSHIBA - NOTEBOOKS

Order No.	Model	Size	Quantity	Price (each)	Inc. VAT
EURMY1308	Satellite 100/110/200/210	16MB	1	£57.95	£68.09
EURMY1462	Satellite 100/110/200/210	32MB	1	£92.95	£109.22
MY6556	Satellite 100/110/200/210	64MB	1	£137.95	£162.09
EURMY1308	Satellite 400/410/420/430	16MB	1	£57.95	£68.09
EURMY1462	Satellite 400/410/420/430	32MB	1	£92.95	£109.22
MY6556	Satellite 400/410/420/430	64MB	1	£137.95	£162.09
MY9274	Portege 650CT, 660CDT	16MB	1	£49.95	£58.69
MY9275	Portege 650CT, 660CDT	32MB	1	£68.95	£81.02
MY6876	Portege 650CT, 660CDT	64MB	1	£125.95	£147.99
MY9274	Satellite 445CDT/CDX	16MB	1	£49.95	£58.69
MY9275	Satellite 445CDT/CDX	32MB	1	£68.95	£81.02
MY6875	Satellite 445CDT/CDX	48MB	1	£99.95	£117.44
MY6876	Satellite 445CDT/CDX	64MB	1	£125.95	£147.99
MY9274	Satellite 460CDT/440CDT/CDX	16MB	1	£49.95	£58.69
MY9275	Satellite 460CDT/440CDT/CDX	32MB	1	£68.95	£81.02
MY6875	Satellite 460CDT/440CDT/CDX	48MB	1	£99.95	£117.44
MY6876	Satellite 460CDT/440CDT/CDX	64MB	1	£125.95	£147.99
MY9274	Tecra 520CDT, 530CDT, 750CDT	16MB	1	£49.95	£58.69
MY9275	Tecra 520CDT, 530CDT, 750CDT	32MB	1	£68.95	£81.02
MY6875	Tecra 520CDT, 530CDT, 750CDT	48MB	1	£99.95	£117.44
MY6876	Tecra 520CDT, 530CDT, 750CDT	64MB	1	£125.95	£147.99
EURMY1308	Tecra 710CDT/720CDT/730/740CDT	16MB	1	£57.95	£68.09
EURMY1462	Tecra 710CDT/720CDT/730/740CDT	32MB	1	£92.95	£109.22
MY6556	Tecra 710CDT/720CDT/730/740CDT	64MB	1	£137.95	£162.09

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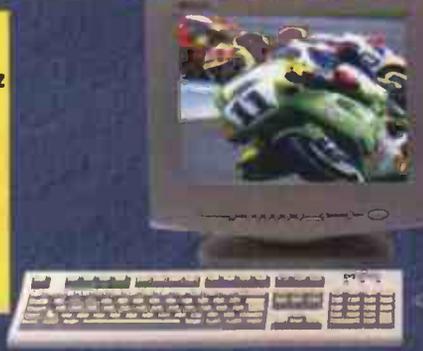
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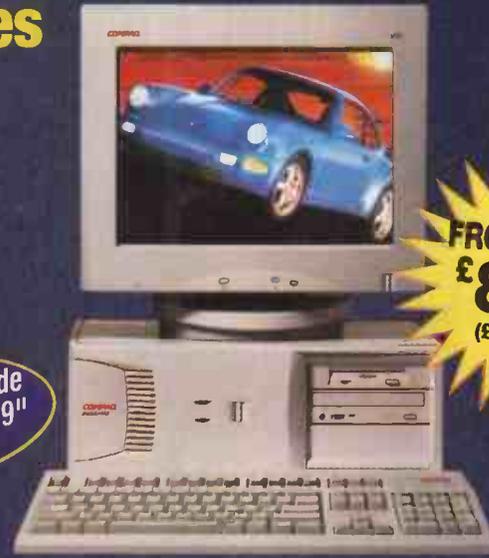
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BN6222	Pentium® II 400MHz	64MB	4.3GB	-	Matrox Millennium G200 AGP 8MB	W95	17" S700	£1,049.00	£1,232.58
BN6220	Pentium® II 400MHz	64MB	4.3GB	-	Matrox Millennium G200 AGP 8MB	WNT	17" S700	£1,095.00	£1,286.63
BN6219	Pentium® II 450MHz	128MB	10GB	32X	Matrox Millennium G200 AGP 8MB	W95	19" S900	£1,549.00	£1,820.08
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<b>COMPAQ</b>									<b>IBM</b>									
Deskpro EP M4300	PII 350MHz	64MB	4.3GB	NT4	CP9429		£755.00	£887.13	PC 300GL	C 333MHz	32MB	3.2GB	98	CP9244		£475.00	£558.13	
Deskpro EN 6350	PII 350MHz	32MB	6.4GB	24X	CP8107		£835.00	£981.13	PC 300GL	C 333MHz	32MB	3.2GB	98	CP9280		£489.00	£574.58	
Deskpro EP M4300	PII 350MHz	64MB	4.3GB	95	CP9428		£745.00	£875.38	PC 300GL	C 333MHz	64MB	3.2GB	32X	98	CP9247		£595.00	£699.13
Deskpro EP SF6 6350	PII 350MHz	32MB	6.4GB	95	CP8976		£879.00	£1,032.83	PC 300GL	PII 350MHz	32MB	3.2GB	98	CP9250		£699.00	£821.33	
Deskpro EP M10G	PII 350MHz	64MB	10.0GB	32X	CP9430		£829.00	£974.08	PC 300GL	PII 350MHz	64MB	3.2GB	98	CP9242		£759.00	£891.83	
Deskpro EN 6350	PII 350MHz	32MB	6.4GB	24X	CP8108		£879.00	£1,032.83	PC 300GL	PII 350MHz	32MB	3.2GB	95	CP8499		£659.00	£774.33	
Deskpro EP M10G	PII 350MHz	64MB	10.0GB	32X	NT4	CP9431	£875.00	£1,028.13	PC 300PL	PII 350MHz	32MB	4.2GB	95	CP7369		£845.00	£992.88	
Deskpro EN SF6 6350	PII 350MHz	32MB	6.4GB	24X	95	CP8977	£939.00	£1,103.33	PC 300PL	PII 350MHz	32MB	4.5GB	98	CP9234		£845.00	£992.88	
Deskpro EP SB 6350	PII 350MHz	64MB	3.2GB	24X	95	CP8985	£1,165.00	£1,368.88	PC 300PL	PII 350MHz	64MB	4.5GB	98	CP9235		£959.00	£1,126.83	
Deskpro EN 6350 M4300/CDS	PII 350MHz	32MB	4.3GB	24X	NT4	CP8104	£1,189.00	£1,397.08	PC 300PL	PII 350MHz	64MB	6.4GB	32X	NT4	CP7370	£989.00	£1,162.08	
Deskpro EP M10G	PII 400MHz	64MB	10.0GB	32X	NT4	CP9433	£1,019.00	£1,197.33	PC 300PL	PII 350MHz	64MB	6.4GB	32X	98	CP9241	£989.00	£1,162.08	
Deskpro EN 6400/CDS	PII 400MHz	64MB	6.4GB	24X	95	CP8085	£1,079.00	£1,267.83	PC 300GL	PII 400MHz	32MB	3.2GB	98	CP9245	£849.00	£997.58		
Deskpro EN SF6 6400	PII 400MHz	32MB	6.4GB	24X	95	CP8979	£979.00	£1,150.33	PC 300PL	PII 400MHz	32MB	4.2GB	95	CP7371	£889.00	£1,044.58		
Deskpro EP M10G	PII 400MHz	64MB	10.0GB	32X	95	CP9432	£975.00	£1,145.63	PC 300GL	PII 400MHz	32MB	3.2GB	32X	98	CP9249	£915.00	£1,075.33	
Deskpro EN SF6 6400	PII 400MHz	64MB	6.4GB	24X	NT4	CP8980	£1,055.00	£1,239.63	PC 300GL	PII 400MHz	64MB	6.4GB	98	CP9252	£949.00	£1,115.08		
Deskpro EN 6400/CDS	PII 400MHz	64MB	6.4GB	24X	NT4	CP8084	£1,125.00	£1,321.88	PC 300PL	PII 400MHz	32MB	4.5GB	98	CP9237	£889.00	£1,044.58		
Deskpro EN 6400 M4300/CDS	PII 400MHz	64MB	4.3GB	24X	NT4	CP8105	£1,309.00	£1,538.08	PC 300PL	PII 400MHz	64MB	6.4GB	32X	95	CP7375	£1,129.00	£1,326.58	
Deskpro EN M6400	PII 450MHz	64MB	6.4GB	32X	95	CP9442	£1,249.00	£1,467.58	PC 300GL	PII 450MHz	64MB	6.4GB	98	CP9253	£1,115.00	£1,310.13		
Deskpro EP M10G	PII 450MHz	128MB	10.0GB	32X	95	CP9434	£1,199.00	£1,406.83	PC 300PL	PII 450MHz	64MB	6.4GB	98	CP9239	£1,125.00	£1,321.88		
Deskpro EN M6400	PII 450MHz	64MB	6.4GB	32X	NT4	CP9443	£1,295.00	£1,521.63	<b>TOSHIBA</b>									
Deskpro EN SF6 M6400	PII 450MHz	64MB	6.4GB	24X	95	CP9450	£1,299.00	£1,526.33	Equium 3000	C 300MHz	32MB	3.2GB	32X	95/98	CP9800	£469.00	£551.08	
Deskpro EP M10G	PII 450MHz	128MB	10.0GB	32X	NT4	CP9435	£1,249.00	£1,467.58	Equium 3000	C 333MHz	32MB	3.2GB	32X	95/98	CP9798	£489.00	£574.58	
Deskpro EN SF6 M6400	PII 450MHz	64MB	6.4GB	24X	NT4	CP9452	£1,345.00	£1,580.38	Equium 7100S	PII 350MHz	64MB	4.3GB	32X	95	CP8677	£709.00	£833.08	
Deskpro EN M9100	PIV 450MHz	64MB	9.1GB	32X	NT4	CP9444	£1,649.00	£1,937.58	Equium 7100S	PII 350MHz	64MB	4.3GB	32X	95	CP8685	£749.00	£880.08	
<b>HEWLETT PACKARD</b>									Equium 7100S	PII 350MHz	64MB	4.3GB	32X	NT4	CP8678	£759.00	£891.83	
Brio Value	C 333MHz/15	32MB	4.3GB	32X	98	BN6138	£559.00	£656.83	Equium 7100D	PII 350MHz	64MB	4.3GB	32X	NT4	CP8686	£799.00	£938.33	
Brio Corporate	PII 350MHz/17	64MB	8GB	32X	98	BN6999	£799.00	£938.83	Equium 7100S	PII 400MHz	64MB	4.3GB	32X	95	CP8679	£825.00	£969.38	
Brio Performance	PII 400MHz/17	64MB	8GB	32X	98	BN6139	£889.00	£1,044.58	Equium 7100D	PII 400MHz	64MB	4.3GB	32X	95	CP8688	£869.00	£1,021.08	
Brio Power	PII 450MHz/17	64MB	8GB	32X	98	BN6140	£1,029.00	£1,209.08	Equium 7100S	PII 400MHz	64MB	4.3GB	32X	NT4	CP8680	£879.00	£1,032.83	
									Equium 7100D	PII 400MHz	64MB	4.3GB	32X	NT4	CP8687	£919.00	£1,079.83	

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- 1200dpi with EPSON MicroGray and RiTech
- Comprehensive network connectivity
- Paper capacity of up to 830 sheets
- Network and PostScript ready configurations



PR14571	EPSON EPL-N1600T	£716.00	(€841.30)
PR14401	EPSON EPL-N1600ENT	£835.00	(€981.13)

### EPSON COLORPAGE EPL-C8000EN

ONLY **£3983**  
(£4600.82)  
PR14571

- Fast 4ppm colour, 16ppm mono, high quality colour laser printer
- Advanced colour laser controller technology
- Photographic 1200dpi class printing on plain paper
- A3W printable area for A3 bleed and crop marks



PR14571 Epson ColorPage EPL-C8000ENT £4663.00 (€5479.03)

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### HP 2000C/CN



FROM ONLY **£450**  
 (£528.75)  
 Item # PR13882

Optional 3yr warranty available on all HP Printers 'HP Support Pack'



- Up to 600dpi
- Up to 10ppm black
- Up to 7ppm colour
- Optional HP SupportPack
- 3 years additional on-site warranty

PR13882	HP 2000C Printer	£450.00	(£528.75)
C4601A	250 sheet accessory paper tray for 2000C	£139.00	(£163.33)
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201325	HP Support Pack	£139.00	(£163.33)



### HP 2500C

Professional Colour Printer

Fast high-impact colour documents at low cost per page

- From postcard to A3 oversize
- Up to 600 dpi black, PhotoRet II for Photo Quality
- Up to 9ppm A4 black
- Colour print speed: up to 7ppm colour A4/4ppm A3

PR14169	HP 2500C Printer	£705	(£828.38)
C4844AE	Black Cartridge	£30.95	(£34.60)
201325	HP SupportPack	£139	(£163.33)



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### HP DESKJET 895Cxi & 880C

HP DeskJet 880C

- Up to 8ppm black, 5ppm colour
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Print quality and performance that meets business demands

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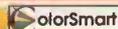


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HP DeskJet 695C

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- 600dpi black, 300dpi colour



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- 6.5 ppm black, 2ppm colour
- Up to 600 x 600 dpi black

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 (£334.88)  
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### HP OFFICEJET 700C & HP DESKJET 720C

HP OfficeJet 700

Only **£323**  
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 Item # PR14502

- Up to 64 page fax memory, 50 speed dials
- Print at 5ppm black, 2ppm colour
- Scan to e-mail

PR14096 HP OfficeJet 710 £309 (£363.08)  
 PR14793 HP OfficeJet 725 £303 (£356.03)



HP DeskJet 720C

- Up to 8ppm black, 4ppm colour
- Up to 600 dpi with black pigmented ink
- PhotoRet II for Photo Quality

Only **£141**  
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### COLOUR LASERJET PRINTERS

FROM ONLY **£741** (£870.68)

#### HP COLOUR LASERJET 4500

Affordable Colour LaserJet printer for the corporate workgroup

- Up to 16ppm black, 4ppm colour
- 600 x 600 dpi, image Ret 2400
- 110 scalable TrueType fonts
- MET for colour PCL and HP Postscript

As low as **£1597**  
 (£1876.48)

PR14280	HP LaserJet 4500	£1597	(£1876.48)
PR14168	HP LaserJet 4500N	£1875	(£2203.13)
PR14162	HP LaserJet 4500DN	£2422	(£2845.85)

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#### HP OFFICEJET PRO SERIES

Print, Copy, Scan and Communicate\* All-in-One - all in colour\* HP OfficeJet 1175C only

- Print:
  - 600 x 600 dpi resolution
  - Up to 9ppm black text and high-quality printing 5ppm colour graphics

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  - Generates up to 9cpm (copies-per-min) in black & white and 3cpm in colour

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  - OCR and image editing software

- Communicate\*:
  - Send documents in electronic format using Digital Document Communications

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- 24 pages per minute print speed and 133 MHz processor
- RIP once technology that reduces print job processing time
- FastRes 1200 that allows 1200 dpi quality

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HP's most advanced printer for business

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- 100-MHz RISC processor. First page out in less than 15 secs
- 600 dpi, FastRes 1200 (1200 dpi quality)
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PR12987	HP LaserJet 4000	£741	(£870.68)
PR12978	HP LaserJet 4000T	£807	(£948.23)
PR12975	HP LaserJet 4000N	£941	(£1105.68)
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PRINTERS



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51625A	HP Inkjet Cartridge, colour for DJ 5000 - 5600, DJ Portable 310/320/340	£16.45	(£19.33)
51629A	HP Inkjet Cartridge, black for DJ 600/680C/670C/690C/694C	£16.65	(£19.56)
51649A	HP Inkjet Cartridge, colour for DJ 00/600C/670C/690C/694C	£18.85	(£22.15)
51633M	HP Inkjet Cartridge, black for DJ Portable 310/320/340	£13.85	(£16.27)
51640A	HP Inkjet Cartridge, black for DJ 1200C/3000/3500	£15.85	(£18.62)
51640C	HP Inkjet Cartridge, cyan for DJ 1200C/1600C/3000/3500	£18.45	(£21.67)
51640M	HP Inkjet Cartridge, magenta for DJ 1200C/1600C/3000/3500	£18.45	(£21.67)
51640Y	HP Inkjet Cartridge, yellow for DJ 1200C/1600C/3000/3500	£18.45	(£21.67)
51645A	HP Inkjet Cartridge, black for DJ 720C/850C/820C/870C/890C/895C/1100C/1600C/OfficeJet Pro	£16.80	(£19.50)
51641A	HP Inkjet Cartridge, colour for DJ 850C/820C/870C/OfficeJet Pro	£17.65	(£20.74)
C1823A	HP Inkjet Cartridge, colour for DJ 720C/850C/895C	£24.40	(£28.67)
C4844AE	HP Inkjet Cartridge large black for C2000C/Cv2500C	£30.95	(£36.37)
C4841AE	HP Inkjet Cartridge Cyan for C2000C/Cv2500C	£30.95	(£36.37)
C4842AE	HP Inkjet Cartridge Yellow for C2000C/Cv2500C	£30.95	(£36.37)
C4843AE	HP Inkjet Cartridge Magenta for C2000C/Cv2500C	£30.95	(£36.37)

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C3831A	HP Premium Glossy Paper, A4, 10 sheets	£7.85	(£9.22)
C3837A	HP Premium Glossy Paper, A4, 50 sheets	£31.45	(£36.95)
C3832A	HP Premium Transparency Film, A4, 20 sheets	£12.35	(£14.51)
C3835A	HP Premium Transparency Film, A4, 50 sheets	£26.95	(£31.66)
51630S	HP CX JetSeries Paper for PaintJet, A4, 50 sheets	£39.90	(£46.88)
51630R	HP Z-Fold CX JetSeries Paper for PaintJet (210 x 305), 250 sheets	£16.95	(£19.91)
51630Z	HP CX JetSeries Paper (PaintJet), A4, 200 sheets	£12.20	(£14.33)
51631B	HP CX JetSeries Paper (PaintJet), A3, 200 sheets	£32.95	(£38.72)
51634Z	HP Premium Inkjet Paper, A4, 200 sheets	£12.65	(£14.86)
C1856A	NEW! HP Premium Inkjet Paper, A3, 100 sheets for DJ 1100C	£18.95	(£22.26)
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C4129X	LJ5000	£93.95	(£110.39)
C4127A	Toner Cartridge for LJ4000	£54.45	(£63.96)
C4127X	High Capacity Cartridge for LJ4000	£76.25	(£89.59)
92274A	Toner Cartridge for LJ4L4M/4P/4MP	£38.95	(£45.77)
92275A	Toner Cartridge for LJ1100/11P/11+ /11P	£47.65	(£55.99)
92281A	Toner Cartridge for LJ1100/11P/11+ /11P	£53.95	(£62.14)
92285A	Toner Cartridge for LJ1100/11P/11+ /11P	£38.95	(£46.94)
92298X	High Capacity Toner Cartridge for long life LJ 4L4M, 4L4MP, 5L5M/5M	£64.45	(£75.72)
92298A	Toner Cartridge for LJ 4L4M, 4L4MP, 5L5M/5M	£51.95	(£61.57)
C3900A	Toner Cartridge for LJ 4L4M/4MP	£81.45	(£95.70)
C3903A	Toner Cartridge for LJ 5P/5MP/6P/6MP	£45.95	(£53.99)
C3906A	Toner Cartridge for LJ 5L	£33.95	(£39.89)
C3909A	Toner Cartridge for LJ 5S, 5S/MX	£104.95	(£123.32)
92285A	Toner Cartridge for LJ Plus LJ 500 Series	£55.95	(£65.72)
C4092A	Toner Cartridge for LJ1100 & 1100A	£90.95	(£107.11)
C4128X	Toner Cartridge for LJ8100	£230.95	(£271.36)
C4191A	Toner Cartridge for LJ4500	£71.95	(£84.54)

#### HP COLOUR LASERJET 5 SUPPLIES

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C3103A	Colour Toner yellow	£26.95	(£31.66)
C3104A	Colour Toner magenta	£26.95	(£31.66)
C3105A	Colour Toner black	£5.45	(£6.40)
C3964A	Coating Kit	£37.95	(£44.59)
C3965A	Black Developer	£127.95	(£150.34)
C3966A	Colour Developer	£390.95	(£459.37)
C3967A	Drums Unit	£236.00	(£277.30)
C3968A	Transfer Belt	£128.95	(£151.51)
C3969A	220 Volt Fuser	£179.95	(£211.44)

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- 10ppm, first page out in 17 seconds
- True 1200 x 1200 dpi
- 600 dpi mode enhanced with RET
- HP PCL6 (45 scaleable typefaces built-in)

PR14648	HP LaserJet 2100	£423	(£497.03)
PR14649	HP LaserJet 2100M	£480	(£564)
PR14650	HP LaserJet 2100TN	£600	(£705)



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**£423**  
(£497.03)  
PR14648



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(£272.60)  
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### HP LaserJet 3100

- Printer . Fax . Copier . Scanner
- 600 dpi output
  - 6pp print, copy, scan, 6 seconds per page fax



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**£471**  
(£553.43)  
PR13320

PR13320	HP LaserJet 3100	£471.00	(£553.43)
C3906A	Black Toner Cart	£33.95	(£39.89)
EURWR1112	SupportPack	£118.00	(£138.65)

### HP LaserJet 5000

- 16ppm print speed
- 100MHz RISC processor
- True 600x1200dpi FastRes (600x2400)
- 110 scaleable TrueType Postscript Level II compatible Typefaces

PR13442	HP LaserJet 5000	£929	(£1091.58)
PR13443	HP LaserJet 5000N	£1334	(£1567.45)
PR13446	HP LaserJet 5000GN	£1649	(£1937.58)
207471	HP Support Pack	£235	(£276.13)



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### HL-820

- 8ppm
- Windows dedicated printing
- 2MB standard memory
- 600 dpi resolution
- Semi automatic double sided printing
- Intelligent sleep mode

Only  
**£159**  
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### HL-P2000

- 10ppm printer
- Personal Desktop Copier
- 600dpi digital scanner with OCR
- 2MB memory
- Semi-automatic double-sided printing
- Auto POP3 email printing

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**£239**  
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### HL-1070

High quality printing at a surprisingly low price.

- 10ppm
- 4MB standard memory, upgradable to 36MB
- Network connectivity option
- PCL6 & PostScript 2 language emulation
- Dual paper tray
- 1200 dpi
- One year on-site warranty
- Intelligent sleep mode

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**£275**  
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PR13781	HL-820	£159	(£186.83)	PR13498	HL-1660e 8MB	£579	(£680.33)
PR13843	HL-1040	£179	(£210.33)	PR13657	HL-1660en 8MB	£779	(£915.33)
PR14220	HL-1050 4MB	£209	(£245.58)	PR13653	HL-1660en 16MB	£795	(£934.13)
PR14220	HL-1050 8MB	£224	(£263.20)	PR14318	HL-2060C 8MB	£639	(£750.83)
PR13772	HL-1070 4MB	£275	(£323.13)	PR14319	HL-2060 16MB	£685	(£804.88)
PR14219	HL-1070 8MB	£290	(£340.75)	PR13362	HL-2060 40MB	£989	(£1056.33)
PR12459	HL-P2000	£239	(£280.83)	PR13492	HL-2060N 80MB	£915	(£1075.13)

## XEROX DOCUPRINT XJ6C

- Print up to 5ppm in black, up to 2.5ppm in colour
- Print 7ppm with high capacity cartridge
- 1200 x 600dpi photo-realistic printing

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**£95**  
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PR14554	Xerox DocuPrint P8e	£235	(£276.13)
PR14555	Xerox DocuPrint P12	£415	(£487.63)
PR14557	Xerox DocuPrint XJ6C	£145	(£170.38)

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- Laser Quality Output
- 1200 x 1200 dpi
- Photo quality images
- Fast Dependable Performance
- Up to 6ppm black
- Up to 2.5 ppm colour
- Easy to Use
- Quick set up
- Easy operation

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PR14002	Lexmark 1100 Colour JetPrinter	£79	(£92.83)
PR13493	Lexmark 5700 Colour JetPrinter	£195	(£229.13)
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- 0.28mm dot pitch
- 1024 x 768 @ 87Hz
- TCO 95



**ViewSonic**  
The Display Technology Company

\* See page 32 for Terms & Conditions

**PAGE 11 OF 32**

\*3 year "Express Exchange" warranty on all new ViewSonic monitor, excluding ViewSonic's presentation and LCD ranges. Limited to the UK mainland the 24 hour service is available in most areas

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- 17" FST (15.7" viewable)
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 Technomatic, Horizon One, Studio Way, Borehamwood, Herts WD6 5WH



## TAXAN UK No.1 Monitor Manufacturer From as low as £225 (£262.38)

TAXAN • SONY • OPTIQUEST • PHILIPS • NEC • PANASONIC

### ERGOVISION 975 TCO 95

- 19" FST (18" viewable)
- 0.26mm dot pitch
- ARASC face treatment
- 30-95 kHz (Multiscan)
- 1600 x 1200 up to 75Hz
- Fully TCO 95 Compliant
- Dual input



ONLY  
**£379**  
 (£445.33)  
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### ERGOVISION 760 TCO 95

- 17" "ZenTan" FST
- 30-70 kHz (Multiscan)
- 1024 x 768 up to 86Hz
- Footprint equivalent to 14" monitor
- Easy one-touch control



ONLY  
**£252**  
 (£296.10)  
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Using the  
 Ergovision 760 TCO 95 you  
 not only save money but also  
 valuable desk space

### CRYSTALVISION 640 TCO 95

- 14.1" Colour TFT LCD
- Up to 1024 x 768 resolution
- 16.7 million colours (24 bit)
- Includes headphone output, stereo speakers (rear facing)

Only  
**£645**  
 (£757.88)  
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MT1680	Ergovision 550 TCO 95 15"	£132	£155.10
MT1681	Ergovision 550 TCO 95-S 15"	£142	£166.85
MT1825	Ergovision 760 TCO 95-S 17"	£262	£307.85
MT1317	Ergovision 2160 TCO 95	£759	£891.83
MT1887	Ergovision 975 TCO 95 19"	£379	£445.33
MT1317	Ergovision 750 TCO 95 17"	£379	£445.33
MT2516	Ergovision 745 TCO 99 17"	£262	£307.85

EURM0517	Crystalvision 640 TCO-95 14.1" TFT	£645	£757.88
MT2146	Crystalvision 660 TCO-95S 15" TFT	£1139	£1338.33
MT2378	Crystalvision 670 TCP-95S 15.1" TFT	£949	£1115.08

### ERGOVISION 735 TCO99

- 17" FST (16" viewable)
- 0.27mm dot pitch
- 1024 x 768 @ 86Hz
- USB Hub (1 upstream, 4 downstream)
- Short Neck Tube (428mm deep)
- Fully TCO99 Compliant



AS LOW AS  
**£225**  
 (£264.38)  
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### ERGOVISION 745 TCO 99

- 17" FST (16" viewable)
- 0.26mm dot pitch
- 1600 x 1200 @ 75Hz
- USB Hub (1 upstream, 4 downstream)
- Short Neck Tube (428mm deep)
- Fully TCO99 Compliant



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A complete 2D/3D graphics solution based on the new Voodoo Banshee™ chipset from 3Dfx interactive®

- 16MB high speed SDRAM
- 128-bit wide graphics engine
- 36 billion operation per second pixel processing pipeline
- Includes 3Deep, Colorific and Incoming



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 CREATIVE LABS, INC.

### MATROX MILLENNIUM G200 GRAPHICS CARD

- 8MB SGRAM upgradeable to 16MB
- Powerful 128-bit video card with full AGP 2X support
- 250MHz RAMDAC for the highest screen rates
- Exceptional 2-D performance with resolutions up to 1920 x 1200



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**£85**  
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MON0490	Optiquest Monitor 17" V773	£229	(£269.08)
MT1401	Optiquest Monitor 17" V775	£239	(£280.83)
MT1405	Optiquest Monitor 17" Q71	£229	(£269.08)
MT1620	Optiquest Monitor V95 19"	£449	(£527.58)
MT1621	Optiquest Monitor V115 21"	£649	(£762.58)
MT1674	Optiquest Monitor Q41	£89	(£104.58)
MT1946	Optiquest Monitor V115T	£359	(£436.83)
MT1653	Optiquest Monitor 15" Q51	£109	(£128.08)
MON0718	Optiquest Monitor 17"	£279	(£327.83)

SONY			
MT1855	Sony Monitor Multimedia 15" 120AS £249	(£292.58)	
MT1856	Sony Monitor Multimedia 17" 220AS £335	(£393.63)	
MT1857	Sony Monitor Multiscan 17" 200PST £379	(£445.33)	
MT1888	Sony Monitor 500PST 21" £745	(£875.38)	
MT1896	Sony Monitor 100ES 15" £149	(£175.08)	
MT1897	Sony Monitor 100GST 15" £209	(£245.58)	
MT1898	Sony Monitor 200EST 17" £269	(£316.08)	
MT1899	Sony Monitor 200GST 17" £295	(£346.63)	
MON0635	Sony Monitor 400PST 19" £479	(£562.83)	
MT2273	Sony Monitor 15" LCD 1500M £1,165	(£1,368.88)	
MT2687	Sony Monitor 19" 420GST £439	(£515.83)	

PANASONIC			
MT1976	Panasonic Monitor 15" S50	£149	(£175.08)
MT1977	Panasonic Monitor 15" P50	£159	(£186.83)
MT1978	Panasonic Monitor 15" SM50	£169	(£198.58)
MT1979	Panasonic Monitor 17" S70	£249	(£292.58)
MT1980	Panasonic Monitor 17" P70	£299	(£351.33)
MT1983	Panasonic Monitor 21" S110	£1,029	(£1,209.08)
MT1984	Panasonic Monitor 21" P110	£1,175	(£1,380.63)
MT1985	Panasonic Monitor LCD 14" LC40E1,715	(£2,015.13)	
MT2235	Panasonic Monitor 17" FST 70	£259	(£304.33)
MT2237	Panasonic Monitor 15" FST E501	£111	(£130.43)

NEC			
MT1217	P1150 21"	£869	(£1009.33)
MT1583	E700 17"	£369	(£433.58)
MT1388	E1100 21"	£739	(£868.33)
MT1117	M700 17"	£395	(£464.13)
MT1584	A500 15"	£155	(£182.13)

### OPTIQUEST Q51

- 15" colour monitor (13.7" diagonal viewable)
- 0.28mm dot pitch
- 1,024 x 768 maximum resolution



ONLY  
**£109**  
 (£128.08)  
 MT1653

OPTIQUEST.

\* See page 32 for Terms & Conditions



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#### Umax Astra 1220P

Only  
**£84**  
(£98.70)



- 600 x 1200 dpi optical resolution
- 9600 dpi interpolated resolution
- 10 bit greyscale
- Parallel port connection

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#### Umax Powerlook II

Drum Scanner quality at a flatbed price!!!



Only  
**£699**  
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- True 36 bit colour
- Maximum interpolated resolution of 9600dpi
- Delivers 600dpi scans in less than one minute
- Includes Tranny

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Only  
**£411**  
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- 800 x 3200dpi optical resolution with Micro Step drive
- 36 bit colour scanning
- Dynamic range of 3.3D
- High speed scanning
- One year RTB with optional 3 year extended warranty

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#### AGFA CL-30 DIGITAL CAMERA

Only  
**£249**  
(£292.56)



- 1024 x 768 dpi
- 24-bit colour
- 1.8" LCD display
- Stores up to 96 images
- 2MB memory card

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### UMAX ASTRA COLOUR SCANNERS

The Astra 1220 Series Colour Scanners from UMAX offer small office and home office users incredible, professional quality colour images. You will enjoy a maximum resolution of 600 x 1200 dpi for quality colour balance and the convenience of single pass scanning for speed.

Plus the Astra 1220 Series offers three models for compatibility with a variety of system interfaces – the Astra 1220S (SCSI), and the Astra 1220U (USB).

#### Umax Astra 1220S & 1220U

The Mainstream Business and Graphics Scanner!

- 30 bit ad/converter, 36 bit with Bit Enhanced Technology
- 600 x 1200dpi optical resolution
- 9600 dpi interpolated resolution
- 10 bit greyscale
- Bit enhanced Technology captures more colours and tones for smoother gradations



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**£99**  
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Item # INP1588

High Quality Scanners

IN6960 Umax Astra 1220S £129 (£151.58)  
INP1588 Umax Astra1220U £99 (£116.33)

#### HEWLETT PACKARD 4100C SCANNER

- Automatic image and text optimisation
- Push button convenience
- Intuitive scanning software
- Scan only once for text and image data acquisition through Dual Image scanning
- Xenon bulb aimed to improve scanner life
- Universal Serial Bus (USB)



ONLY  
**£119**  
(£139.83)  
IN7207

IN7207 HP 4100C Scanner £119 (£139.83)  
WR1219 HP SupportPack £65 (£76.38)

#### HEWLETT PACKARD 5200 SCANNER

- HP Intelligent Scanning Technology
- USB/Parallel Interface
- 600 dpi optical resolution
- 36-bit depth
- Optional ADF
- Windows 95, Windows 98 & Windows NT 4.0 compatible



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**£199**  
(£233.83)  
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#### HP DC-20 DIGITAL CAMERA

- 1 megapixel CCD resolution
- 24 bit colour
- Built in flash with red eye reduction
- Mechanical shutter for sharp images

HEWLETT PACKARD



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**£299**  
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#### HEWLETT PACKARD SCANJET 6250C

- Integrated automatic document feeder
- Improves productivity up to four times
- Enhanced resolution for quality image capturing
- Networkable



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SCANNERS/CAMERAS/PROJECTORS

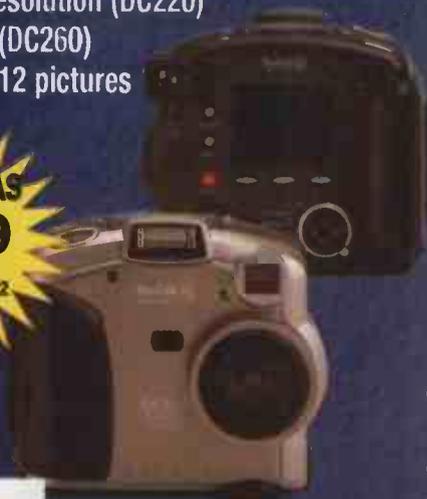
# Logitech Quickcam from £65 (£76.38)

KODAK • DATEK • LOGITECH • 3M • SANYO • MICROSOFT

## KODAK DC-220 & DC-260 & DC-210 DIGITAL CAMERAS

- 1152 x 864 resolution (DC220)
- 1536 x 1024 (DC260)
- Stores up to 12 pictures

**AS LOW AS**  
**£419**  
 (£492.33)  
 Item # IN7112



**Kodak**  
 digital science  
 PRODUCTS

IN7112 DC220 £419 (£492.33)  
 IN7111 DC260 £669 (£786.08)

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**£339**  
 (£398.33)  
 Item # IN7418



- Megapixel resolution of 1152 x 864 pixels
- 2 x zoom lens with close-up mode
- LCD display
- Carry case, AC power adapter and 8MB Picture Card included

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**Basic Mouse**

Only **£10.99**  
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 IN7495



**Great Value, Easy to Use**  
 The Basic Mouse is great value, and is built to last. It is an ambidextrous two-button mouse that fits a range of hand sizes. The first time anyone has been able to purchase a Microsoft Mouse in this price range.

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• Includes ECU key  
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 • Shortcuts to Windows 95™ & 98™

**IntelliMouse Pro**

Microsoft  
 Relax your hand and keep in neutral alignment!  
 Only **£29.99**  
 (£35.24)  
 IN7499



IntelliMouse Pro offers advanced zooming and scrolling capabilities with its incorporated rolling wheel. Work hands free with AutoScroll by simply pressing the wheel and watching your documents scroll down automatically!

### QUICKVIDEO DVC1

QuickVideo DVC1 is a colour digital video camera that connects directly to your PC's parallel port

- Video capture frame rates up to 30 frames per second
- 508 x 492 pixel resolution colour CCD
- Video input to any Windows 95 PC with a bi-directional Parallel Port
- No external power adapter required
- Designed to sit on top of monitor



**ONLY**  
**£74.95**  
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### LOGITECH QUICKCAM HOME

- Internet video. Make contact!
- Make live video calls
- Capture video or photos instantly and send over the Internet
- Plug and play with USB and Windows 98™



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**£65**  
 (£76.38)  
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### 3M MP8610 PROJECTOR

- 500ANSI lumens
- Two 10w built in speakers
- Six remote controlled presentation tools
- Rugged and durable for maximum portability



**3M**

**ONLY**  
**£1995**  
 (£2344.13)  
 Item # MT2286

### SANYO SU-15 PROJECTOR

- Ultra lightweight only 3.9kg
- 600 Ansi lumens
- Digital zoom and focus
- SVGA 800 x 600dpi



**ONLY**  
**£3489**  
 (£4099.58)  
 MT2483

**MS Mouse 2.0**

Only **£19.99**  
 (£23.49)  
 207066



• The front-weighted ball, improved internal mechanisms, and solid tactile feeling give you precise control of the cursor. The more you use it, the more task-efficient you can become.

• The IntelliPoint Toolbar makes it easy to activate the features you use most: Magnify, LineLock, AutoScroll, Trails, and Click-Lock

• 3 Year Warranty

\* See page 32 for Terms & Conditions



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DRIVES & STORAGE

## NEW 250MB ZIP DRIVE

### PERSONAL STORAGE, GREAT VALUE

#### Zip Disks

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**£31.95**  
(£37.54)



BN6136	250MB Zip Disk 2 Pack	£31.95	(£37.54)
BN6137	250MB Zip Disk 4 Pack	£49.95	(£58.69)
ME7941	100MB Zip Disk 6 Pack	£39.00	(£45.82)
ME7940	100MB Zip Disk 20 Pack	£121.00	(£142.17)

#### Jaz Cartridges

From only  
**£55**  
(£64.62)



236694	Jaz 1GB Single	£55.00	(£64.62)
ME7527	Jaz 2GB Single	£65.00	(£76.37)
ME7529	Jaz 2GB 3 Pack	£159.00	(£186.82)

#### Ditto Media

From only  
**£17**  
(£19.97)



ME7456	DittoMax 5GB Tape	£17.00	(£19.97)
ME7456	DittoMax 7GB Tape	£17.95	(£21.09)
ME7456	DittoMax 10GB Tape	£21.95	(£25.79)

#### Amacom PCMCIA Zip Drive

Only  
**£165**  
(£193.88)

- Ultra lightweight and compact
- Powered directly from your computer
- Uses standard Iomega® 100MB Zip Disks
- 16 bit transfer - up to 3.3MB/Sec
- Real Plug & Play



Ask for item # DR9172

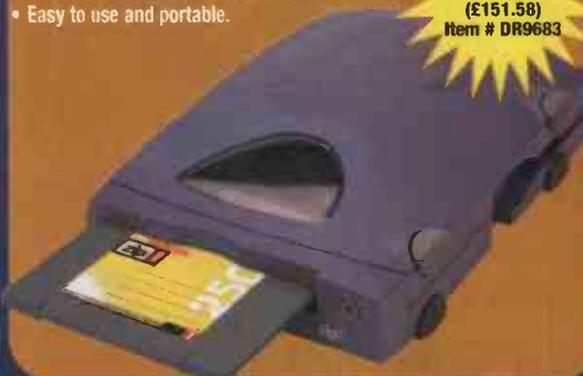
### 250MB ZIP DRIVE

Iomega introduce the new 250MB Zip drive, the new generation of Zip drive

The new high capacity Zip 250 drive and disks are now available from Inmac. The perfect answer for the growing file size demands that are being driven by the growth in the size of computer applications.

- Compatible with Zip 100 disks and drives
- Higher capacity
  - 175 times more capacity than a floppy disk
- Faster performance
  - up to 56 times faster than a floppy drive.
- Easy to use and portable.

ONLY  
**£129**  
(£151.58)  
Item # DR9683



### ZIP USB DRIVE

Iomega introduce the new Zip USB drive, the perfect companion for iMac and PC's with Windows 98 works with new USB connection.

- Easy to connect - just plug it into your USB port
- Hot swappable - Switch with other USB devices without turning off your computer
- Reliable - use it like your hard drive and run your software
- Compatible with 100MB Zip disks
- Up to 60MB per minute transfer rate

ONLY  
**£85**  
(£99.88)  
Item # DR9464



### ZIP 100MB STARTER KIT

Here's what you get

- Parallel Port Zip Drive
- 6-pack of Multicoloured disks
- Recordit software
- Iomega Tools on Zip Disk

Only  
**£95**  
(£111.63)  
Item # DR8960



### JAZ 2GB DRIVE

What you get!

- External 2GB Jaz Drive

Don't forget your media

Only  
**£235**  
(£276.16)  
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### FRECOM EXTERNAL CD-RW

- 4x Write, 4x Rewrite, 20x Read
- CD-Rewriter for connection to parallel/PCMCIA/USB ports (cables not included)
- Create your own CD's on CD-R media
- Ideal for CD-creation, backup, archiving, and exchanging data
- Includes software, manuals and media

**FRECOM**  
COMPUTER CONNECTIONS  
THE STORAGE COMPANY

ONLY  
**£265**  
(£311.38) Item # DR9339



AC25319	IQ Parallel Cable	£24	(£28.20)
AC25817	IQ PCMCIA Cable	£32	(£37.60)
AC26279	IQ USB Cable	£32	(£37.60)

### PANASONIC DVD-RAM DRIVE

- Internal SCSI rewritable DVD-RAM drive
- Choice of 2.6GB or 5.2GB discs
- Store 4 times the capacity of a PD or CD-R on a single side
- Read; CD-ROM, CD-R/CD-RW/DVD-ROM/DVD-RAM/DVD-Video\* and PD discs
- Write to PD and DVD-RAM discs
- Compatible with Windows 95/98 and NT

**Panasonic**

Only  
**£359**  
(£421.83)  
Item # DR9148



\*Additional MPEG2 playback hardware required

ME7985	Panasonic 2.6GB DVD-RAM Media	£14.95	(£17.57)
ME7961	Panasonic 5.2GB DVD-RAM Media	£22.95	(£26.97)

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STORAGE

**24X Portable CD-ROM Drive only £129 (£151.58)**

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**PLEXTOR CD-R DRIVES**

- 4X Write (600KB/s / 12X Read (1800KB/s)
- Max 5MB/sec burst data transfer rate
- Fast SCSI-2 Interface
- MultiRead Compatible
- Caddy loading Mechanism
- Supports Disk-At-Once, Track-At-Once, Multisession and Packet Writing Modes

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- DR9613 Plexwriter 8X/20X Internal SCSI £315 (£370.13)
- DR9614 Plexwriter 8X/20X External SCSI £365 (£428.88)



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**UltraPlex 40Max**

Plextor's 40X CD-ROM drive is the first drive which offers maximum 40 speed in full CAV with an Ultra SCSI interface.

- Internal SCSI 40X CD-ROM
- Data transfer rate between 2.5MB/s - 6MB/s
- Random Access time 85ms
- 512KB Buffer • Two Year Warranty

- DR9612 UltraPlex 40X External Tray £125 (£146.88)

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**CD DRIVE SPECIALS**

**Freecom Traveller CD Drive**

Only **£129** (£151.58) DR8331

- 24X Read speed
  - Super lightweight and portable CD drive
  - Built-in rechargeable battery pack
  - Automatic charging and sleepmode
  - Connect to parallel, PC/MCIA and/or USB ports (cables not included)
- AC25219 Freecom IO Parallel Cable £24 (£28.20)  
 AC25817 Freecom IO PC/MCIA Cable £32 (£37.60)  
 AC26279 Freecom USB Cable £32 (£37.60)

**Amacom Bravo CD-ROM**

As low as **£149** (£175.08) DR7918

- 20X PC/MCIA CD drive
- Up to 3MB/Sec
- Mobile audio CD player
- Fully hot swappable

**Adaptec 2940UW Kit**

Only **£165** (£193.88) 236129

- 40MByte/sec Ultra Wide SCSI data transfer rate
- Connect up to 15 SCSI peripheral devices
- Designed for true multitasking

**EASY CD CREATOR 3.5**

ONLY **£55** (£64.63) EX9434

- Create your own data, audio, video and multimedia CDs
- PhotoRelay for creation of CDs with digital content
- Enhanced Spin Doctor with Sound Morph technology
- Jewel case creator for CD labels and jewel case inserts

**TRAXDATA CD-R DRIVES**

- 4X Write, 8X Read
- High speed CD-ROM read capability
- Software included enabling you to record up to 1.2GB on a single 650MB CD
- Fast access and low CPU utilisation
- Supporting packet, disk at once and track at once recording modes
- Internal IDE interface

- DR8359 4X/12X CD-R Int SCSI Drive £189 (£222.08)
- DR8358 4X/12X CD-R Ext SCSI Drive £239 (£280.83)



Only **£169** (£198.58) Item # DR9697



**TRAXDATA CD-RW DRIVES**

- Traxdata CDRW2260 PLUS series recorders feature high speed ATAPI/IDE interfaces for fast transfer of data from hard disks to CD-R or CD-RW
- 2X Write, 2X Rewrite & 6X Read
  - Record and read all common formats
  - Compatible with CD-RW and CD-R disks
  - Software included enabling you to record up to 1.2GB on a single 650MB CD
  - ATAPI/IDE interface for high speed data transfer

- DR8918 2X/2X/6X External Parallel £199 (£233.83)
- DR8920 2X/2X/6X Internal SCSI £195 (£229.13)
- DR8924 2X/2X/6X External SCSI £225 (£264.38)

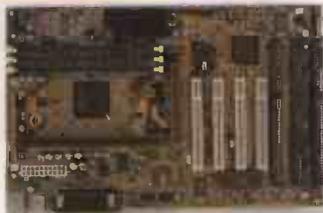


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FROM **£59** (£69.33) Item # EX9688

Code	Factor	Intel Chipset	Memory (DIMM)	Slots PCI/ISA/AGP	Price	(Inc.VAT)
EX9688	Baby AT	440LX	2	3/3/1	£59	(£69.33)
EX9685	ATX	440LX	3	4/3/1	£65	(£76.38)
EX9687	Baby AT	440BX	3	3/3/1	£79	(£92.83)
EX9684	ATX	440BX	4	5/2/1	£85	(£99.88)
EX9686	ATX	Dual 440BX	4	4/2/1	£165	(£193.88)

**YAMAHA CD-RW DRIVES**

- 4X Write, 4X Rewrite, 16X Read
- 2MB Buffer for high-speed 4X recording
- Internal or external SCSI-2 connection
- Retail packaged with full instructions and manuals
- Software included; Adaptec Easy CD Creator, Direct CD software for W95/NT



From Only **£229** (£269.08)



- DR9379 4X/4X/16X External SCSI £275 (£323.13)
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\* See page 32 for Terms & Conditions



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### OUTSTANDING SYSTEM UPGRADES

#### 200MHZ MXPRO UPGRADE

- Boost your PC to 200MHz
- Upgrades P75, 90, 100, 133, 150 and 166MHz
- 64K Write-back cache
- Includes high performance BIOS upgrade
- Lifetime Warranty

Doubles the performance of Windows® 98\*

**As low as £89 (£104.58)**

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The best graphics board for demanding PC users

- 4MB SGRAM PCI card
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- Refresh rates up to 200 Hz
- Valuable software bundle

**ONLY £59 (£69.33)**

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- Best PCI solution for any studio application
- Incredible 256-voice capability
- Environmental Audio for the most realistic sound

**As low as £99 (£116.33)**

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- Ultra ATA Interface
- 9.5m/s seek time
- 5400 RPM
- 512KB buffer

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### WIN/TV CARDS

Hauppauge is a world leader in delivering the best TV and digital video boards for PC's. Win TV's are used for TV watching, video capture and for teletext all in a product range which is Totally Versatile.

#### Win TV Primio

**ONLY £49! (£57.58)**  
 Item # EX9191

- 122 channel cable and TV reception
- Teletext support
- Plug & Play for Windows 95/98
- PCI Bus Architecture
- Compatible with most cards supporting DirectDraw

#### Win TV Nicam

**AS LOW AS £67! (£78.73)**  
 Item # EX7374

- 122 channel cable and TV reception
- Professional Teletext support with print, save and DDE
- Nicam Stereo Sound
- Plug & Play for Windows 95/98
- PCI Bus Architecture
- Compatible with most cards supporting DirectDraw

#### Win TV Radio

**ONLY £79! (£92.83)**  
 Item # EX9192

- Cable TV reception in 2 channel
- Nicam Stereo Sound
- Cable FM Stereo Radio Tuner
- Professional Teletext
- PCI Bus Architecture
- Windows Plug & Play

### Ultra ATA Hard Drives

### Ultra SCSI Hard Drives



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>SEAGATE</b>					
DR8848	Medalist	ST33221A	3.2GB	£75	(£88.13)
DR8077	Medalist	ST34321A	4.3GB	£79	(£92.83)
DR8078	Medalist	ST36531A	6.5GB	£95	(£111.63)
DR8605	Medalist Pro	ST36330A	6.5GB	£115	(£135.13)
DR8079	Medalist	ST38641A	8.6GB	£115	(£135.13)
DR8195	Medalist Pro	ST39140A	9.1GB	£139	(£163.33)



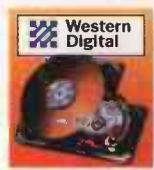
Item	Model	Part Number	Capacity	Price	Inc VAT
<b>SEAGATE</b>					
DR8734	Medalist Pro (W)	ST34520W	4.5GB	£149	(£175.08)
DR8573	Barracuda	ST34573N	4.5GB	£265	(£311.36)
DR8750	Medalist Pro	ST36530N	6.5GB	£199	(£233.83)
DR8748	Medalist Pro (W)	ST36530W	6.5GB	£199	(£233.83)
DR8745	Medalist Pro	ST39140N	9.1GB	£259	(£304.32)
DR8746	Medalist Pro (W)	ST39140W	9.1GB	£279	(£327.83)
DR8188	Barracuda	ST118273N	18.0GB	£595	(£699.13)
DR8755	Cheetah (W)	ST118202W	18.2GB	£789	(£927.08)



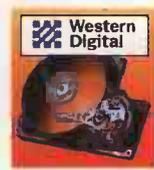
Item	Model	Part Number	Capacity	Price	Inc VAT
<b>QUANTUM</b>					
DR9154	Fireball EX	QM303200EX-A	3.2GB	£72	(£84.60)
DR9244	Fireball EX	QM306400EX-A	8.4GB	£89	(£104.58)
DR9493	Bigfoot TS	QM506400TS-A	6.4GB	£85	(£99.88)
DR8777	Fireball EL	QM307600EL-A	7.6GB	£105	(£123.38)
DR8778	Fireball EL	QM310200EL-A	10.2GB	£139	(£163.33)
DR9492	Bigfoot TS	QM519200TS-A	19.2GB	£225	(£264.38)



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>QUANTUM</b>					
DR8780	Viking II (W)	QM304550PX-LW4.5GB	4.5GB	£155	(£182.13)
DR8489	Viking II (W)	QM309100PX-LW9.1GB	9.1GB	£275	(£323.13)
DR8279	Viking II (W)	QM309100PX-SW9.1GB	9.1GB	£289	(£339.58)
DR8457	Atlas III	QM309100TDS	9.1GB	£299	(£351.33)
DR8609	Atlas III	QM318200TDS	18.2GB	£589	(£692.08)
DR8495	Atlas III (W)	QM318200TD-LW18.2GB	18.2GB	£589	(£692.08)



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>WESTERN DIGITAL</b>					
DR6335	Caviar	AC13200	3.2GB	£75	(£88.13)
DR6666	Caviar	AC24300	4.3GB	£82	(£96.35)
DR6912	Caviar	AC25100	5.1GB	£89	(£104.58)
DR7049	Caviar	AC26400	6.4GB	£99	(£116.33)
DR6831	Caviar	AC38400	8.4GB	£115	(£135.13)
DR9590	Caviar	AC313000	13.0GB	£145	(£170.38)



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>WESTERN DIGITAL</b>					
DR6106	Enterprise	WDE4360-0003	4.3GB	£215	(£252.63)
DR6110	Enterprise (W)	WDE4360-0007	4.3GB	£219	(£257.33)
DR8020	Enterprise	WDE9100-0003	9.1GB	£285	(£334.88)
DR7975	Enterprise (W)	WDE9100-0007	9.1GB	£285	(£334.88)
DR9664	Enterprise	WDE18300-0048	18.3GB	£665	(£781.38)



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>IBM</b>					
DR9067	Deskstar 4GP	00K4125	4.3GB	£105	(£123.38)
DR6918	Deskstar 8	00K4115	6.4GB	£115	(£135.13)
DR8066	Deskstar 8	00K4101	8.4GB	£142	(£166.85)
DR8683	Deskstar 16	00K4091	10.1GB	£169	(£198.58)
DR6687	Deskstar 16	00K4071	14.1GB	£339	(£398.33)
DR8685	Deskstar 16	00K4073	16.8GB	£305	(£358.38)



Item	Model	Part Number	Capacity	Price	Inc VAT
<b>IBM</b>					
DR6958	UltraStar 2ES	09J1035	4.3GB	£145	(£170.38)
DR8238	UltraStar 2ES (W)	09J1037	4.3GB	£159	(£186.83)
DR8515	UltraStar 9ES	00K3970	9.1GB	£359	(£421.83)
DR8514	UltraStar 9ES (W)	00K3990	9.1GB	£359	(£421.83)
DR8167	UltraStar 18XP	59H6589	18.0GB	£679	(£797.83)
DR8168	UltraStar 18XP (W)	59H6591	18.0GB	£719	(£844.83)

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Technomatic, Horizon One, Studio Way, Borehamwood, Herts WD6 5WH



# HP 2x2x6x CD-RW Drive only £149 (€175.08)

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STORAGE



## HP STORAGE SOLUTIONS

### HP Colorado 8GB

### HP Surestore CD-Writer 8100i

Great software included  
Adaptec Direct CD/Easy CD,  
HP Simple Trax, HP Disaster  
Recovery, HP Fast Format,  
Multimedia Tutorial,  
Install Assistant

Includes your first tape

ONLY **£225**  
(£264.33)  
Item # DR8786



The HP Colorado 8GB drives deliver extremely high performance and high capacity at an astonishingly low price. Allowing you to store 8GB on a single data cartridge\* and store data at a rate of up to 3GB in well under an hour.\*\*

- \* Disaster recovery for Windows 95 with full system protection
- Store up to 8GB (compressed capacity)
- Includes Colorado Backup by Computer Associates for Windows 95, Windows and DOS

- 24X Read, 4X Write CD-R and 2X Re-write CD-RW
- Supports CD-R and CD-RW
- Create Multiple types of CD
- Up to 650MB Storage Capacity
- Fast Format CD-RW media in under 5 minutes

DR8149	Colorado 8GB Internal IDE	£149	(£175.08)
DR9739	Colorado 8GB External Parallel	£175	(£205.63)
DR9517	Colorado 5GB External Parallel	£145	(£170.38)
DR7763	Colorado T3000 3.2GB Internal	£99	(£116.33)

\* via compression      \* speeds may vary according to PC



FROM **£99**  
(£116.33)  
Item # R

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### HP 7200 Plus CD-RW Drive

Only **£149**  
(£175.08)  
DR7994



- 6X Read, 2X Write, 2X Rewrite
- Write, update and rewrite on a single 650MB disk
- Easy to use 'drag-and-drop' functionality
- Available as IDE Internal or External Parallel
- DR7994: 7200CD-RW Internal IDE £179 (€210.33)
- DR7995: 7200CD-RW External Parallel £235 (€276.13)

### HP Colorado 5GB Internal

As low as **£119**  
(£139.83)  
DR9518



- Up to 5GB compressed capacity
- Disaster recovery for Windows 95 with full system protection
- Low cost HP Colorado 5GB media
- Internal IDE interface

### Seagate Travan 8GB

Only **£169**  
(£198.58)  
DR9099



- Up to 8GB compressed capacity
- Back up speed of up to 60 Mbytes/sec
- ATAPI interface
- 2-Year Warranty

### DLT Tapes

ME7419	Maxell DLT III TK85	£23.95	(€28.14)
ME7591	Maxell DLT III XT TK87	£25.95	(€30.49)
ME7954	Sony DLT III XT TK87	£28.95	(€34.01)
ME7590	Quantum DLT III XT TK87	£34.95	(€41.07)
ME7020	HP DLT III XT TK87	£35.95	(€42.24)
ME7080	Fuji DLT IV TK88	£60.95	(€71.61)
ME7823	Quantum DLT IV TK88	£61.95	(€72.79)
ME7021	HP DLT IV	£67.95	(€79.84)

\* See page 32 for Terms & Conditions

## HP SURESTORE T20 i/e



- Up to 20GB compressed capacity
- Uses TR-5 cartridge
- Includes Replica Backup (Win NT Server), Colorado Back Up II (Win NT W/Stn) and Back up and disaster recovery for W95, 98 and NT
- 2-year Express Exchange hardware warranty

DR9164: 10/20GB TR-5 Internal SCSI **£259** (€304.33)  
DR9163: 10/20GB TR-5 External SCSI **£319** (€374.83)

From **£259**  
(€304.33) Item # DR9164



## HP SURESTORE DAT/DLT SOLUTIONS



Whether your concern is backing up and restoring data for single users on a desktop or portable PCs, or thousands of users working off centralised servers, HP Surestore has a system that will meet your needs for protection against catastrophic data loss.

DR9511	12/24GB DAT Internal SCSI	£675	(€793.13)
DR9510	12/24GB DAT External SCSI	£749	(€880.08)
DR8392	20/40GB DLT Internal SCSI	£1799	(€2113.83)
DR5721	20/40GB DLT External SCSI	£1969	(€2313.58)
DR9188	35/70GB DLT Internal SCSI	£3799	(€4463.83)
DR7450	35/70GB DLT External SCSI	£4199	(€4933.83)



From **£675**  
(€793.13)  
Item # DR9511

## CDR & CDRW



CDR				
220720	Maxell	74min	650MB	£1.40 (€1.65)
ME6399	Sony	74min	650MB	£1.45 (€1.70)
ME7399	TDK	74min	650MB	£1.60 (€1.88)
ME7889	HP	74min	650MB	£1.85 (€2.17)

CDRW				
ME7724	Maxell	74min	650MB	£11.45 (€13.45)
ME7723	Sony	74min	650MB	£11.45 (€13.45)
ME7661	TDK	74min	650MB	£10.95 (€12.86)
ME7858	HP	74min	650MB	£11.95 (€14.04)

## DATA CARTRIDGES



DATA CARTRIDGES				
236597	Sony QTR1	8MB Travan	£10.75	(€12.63)
ME6601	Sony QTR3	3.2GB Travan	£14.45	(€16.97)
ME6936	Sony QTR4	8.0GB Travan	£19.25	(€22.62)
220920	Imation	Travan TR1	£12.45	(€14.63)
ME7701	Imation	Travan 5GB	£19.95	(€23.44)
62160	Imation	Magnos 1.0GB	£22.95	(€26.97)



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## PSION GOLD CARD GLOBAL 56K & FAX £139 (£163.33)

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### MODEMS

#### XIRCOM

- Integrated 10/100 LAN, 56Kbps modem and phone pass-through connectors
- Uses standard RJ-45 and RJ-11 cords
- globalACCESS features such as CountrySelect software and extensive country approvals ensure reliable connections worldwide
- GSM Ready (Need to purchase the GSM Kit, please see below)
- ISDN capable via additional connection kits

**AS LOW AS**  
**£187.80**  
 (£220.67)  
 Based on 5pk price  
 DMD3795



DMD3563	RealPort Ethernet 10/100 + modem 56	£209.00	(£245.58)
DMD3795	RealPort Ethernet 10/100 5 pack	£339.00	(£1103.33)
DMD3796	RealPort Ethernet 10Mbps + Modem 56K	£179.00	(£210.33)
DMD3797	RealPort Ethernet 10/100Mbps	£98.00	(£104.58)
DMD3798	RealPort Modem 56K GlobalACCESS	£119.00	(£139.83)
DCA4693	RealPort GSM Connection kit for Ericsson 688/788	£88.00	(£81.08)
DCA4694	RealPort GSM Connection kit for Nokia 3110/6110	£88.00	(£81.08)

#### PACE 56 VOICE MODEMS

- 56Kbps voice/fax/data external, internal or PC Card modem
- Award winning 56K V90 modems!
- Voicemail, fax mail & email
- Flash upgradeable to future standards
- Remote access for message collection

**EXTERNAL VOICE**  
**ONLY**  
**£89**  
 (£104.58)  
 DMD3555

DMD3555	Pace Modem 56K External Voice	£99	(£104.58)
DMD3556	Pace Modem 56K Internal Voice	£79	(£92.83)
DMD3557	Pace Modem 56K PCMCIA	£99	(£116.33)
DMD3681	Pace 56K Solo External Modem	£135	(£158.63)

#### TDK GLOBAL FREEDOM 5660 56K FAX/MODEM PC CARD

- 56K Global class modem
- Over 80 country approvals
- K56 flex technology - flash upgradeable to v.90
- GSM ready

**ONLY**  
**£159**  
 (£189.83)  
 DMD3512

DMD3512	TDK 5660 Fax/Modem PCMCIA	£159	(£189.83)
---------	---------------------------	------	-----------

GSM Upgrade Kits available, please call

### EXPERTS IN MOBILE NETWORKING

#### Gold Card NetGlobal 56k + 10Mb

- Simultaneous modem and ethernet operation
- Upgradeable to 10Base2
- GSM and ISDN ready via optional upgrades
- Globally approved
- Supports all common Ethernet standards and most common operating systems

#### Gold Card Global Series

- High speed global modem - 56Kbps and 33.6 (V34) versions
- GSM and ISDN ready via optional upgrades
- All major mobile phones supported including: Nokia, Ericsson and Motorola

#### Gold Card ISDN Upgrade

- Two 64Kbps data channels can be used separately or combined for 128Kbps of digital data
- Utilises 'active' ISDN technology - just plug in for high-speed digital data
- Features DIVA ISDN technology from Eicon - a world ISDN leader

#### Gold Card GSM Upgrades

- Manufactured with the co-operation and support of the major phone manufacturers including: Nokia, Ericsson and Motorola
- Data and Fax transfer at 96000bps
- GSM fax and data anywhere in the world with a GSM or PCS network



**AS LOW AS**  
**£67.99**  
 (£79.89)  
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All products with lifetime warranty and support

DEC3316	Global Card NetGlobal 56k + 10Mb	£179.00	(£210.33)
DEC3314	Gold Card NetGlobal 10Mb	£67.99	(£79.89)
DEC3315	Gold Card NetGlobal 10/100Mb	£99.95	(£117.45)
DEC3328	Gold Card NetGlobal Caribus 10/100Mb	£99.95	(£117.45)
DMD2964	Gold Card Global 56K+Fax	£139.00	(£163.33)
DMD2978	Gold Card Global V.34+Fax	£119.00	(£139.83)
DMD2583	GSM Nokia 2110 Upgrade	£89.00	(£104.58)
DMD2585	GSM Nokia 8110 Upgrade	£89.00	(£104.58)
DMD3605	GSM Nokia 8110 Upgrade	£89.00	(£104.58)
DMD3706	GSM Ericsson 300 Upgrade	£89.00	(£104.58)
DMD3753	GSM Ericsson 600/700 Upgrade	£89.00	(£104.58)
DMD3995	GSM Motorola Upgrade	£89.00	(£104.58)
DMD3723	Gold Card 56K + ISDN	£269.99	(£317.99)
DMD3680	ISDN Upgrade Kit	£139.99	(£164.49)

### AWARD WINNING MODEMS FROM HAYES

#### Hayes ACCURA V.90 56K



**ACCURA V.90 56K FROM**  
**£79**  
 (£92.83)  
 Item # DMD2425

- Internet download speeds of up to 56,000 bit/s from compatible ISPs
- FREE Internet software and FREE Internet access!!!\*
- Send and Receive faxes
- Voice answer phone facility
- Built in speakerphone
- \* Excludes telephone charges



**ONLY**  
**£169**  
 (£198.58)  
 Item # MM4051

#### Hayes ACCURA ISDN Terminal Adapter in association with BT

- BTHighway compatible - use your existing phone line for super fast digital Internet access and the use of your phone at the same time
- Multilink PPP for up to 128K bit/s throughput
- Standard EuroISDN interface
- Two analogue ports
- Rate adaptation support (V.110/V.120)
- AutoAnswer routes call to the highest possible connection

#### Hayes OPTIMA V.90 Global PC Card

- Fast Internet access and connections around the world
- GSM and ISDN ready, simply add the appropriate accessory kit
- Data/FAX discrimination
- Flash ROM upgradeable

DMD2424	Accura V.90 56K Internal	£76.00	(£89.30)
DMD3098	MSN V.90 56K Internal	£89.00	(£104.58)
DMD2425	Accura V.90 56K External	£79.00	(£92.83)
DMD3099	MSN V.90 56K External	£94.99	(£111.61)
DMD2531	Accura 336 PC Card	£86.00	(£101.05)
DMD3281	Optima V.90 56K PC Card	£145.00	(£170.38)
AC24394	Nokia 8110/3110 GSM kit	£95.00	(£111.63)
AC24393	Nokia 2110 GSM kit	£95.00	(£111.63)
AC24395	Panasonic Global GSM kit	£95.00	(£111.63)
MM4018	Optima 336 Business Ext	£149.00	(£175.08)
MM4051	Accura ISDN TA	£169.00	(£198.58)
DMD3775	Optima V.90 56K Business External	£169.00	(£198.58)
DMD3989	Hayes/BT V.90 Internet Kit	£99.00	(£116.33)

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MODEMS/NETWORKING

# 3Com Modems from only £59 (£69.33)

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### 56K\* Professional Message Modem

Voice Faxmodem with Answerphone Facility

The Professional Message Modem offers a high quality fax modem with answering machine capabilities for storing messages even when your PC is switched off. Integrated x2™ technology allows you to download from the Internet at speeds up to 56Kbps\* with an option to upgrade to the V.90 ITU 56K\* standard\*\*.



**FROM ONLY £109.95**  
(£129.19)  
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### 56K\* Voice Faxmodem

56K\* Faxmodem with Personal Voice Mail

The Voice Faxmodem provides fax, e-mail and personal voice mail facilities all in one compact unit with the feature of 56Kbps\* V.90 ITU standard and x2™ technology. Multiple voice mailboxes (up to 1000) allow each person in your home or office to retrieve and listen to messages and even access them remotely.

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Item # DMD3587

DMD3587	56K* Professional Message Modem	£109.95	(£129.19)
DMD3573	3Com 56K* Voice Faxmodem Ext	£69.95	(£82.19)
DMD3442	Sportster Flash 56K* Internal	£87.95	(£79.84)
DMD3582	3Com 56K* Message Modem	£86.95	(£104.52)
DMD3151	Sportster Winmodem PC card 33.6 (Win 95)	£89.95	(£82.19)
DMD3601	Sportster 56K* Internal Winmodem	£89.95	(£70.44)
DMD3129	Sportster 56K* TA External	£99.99	(£117.49)
Z34037-5	Courier V34 33.6 External	£185.00	(£217.38)
DMD1316	Courier V34 33.6 Internal	£115.00	(£130.83)
MMD3994	Courier-1 ISDN/V34 External	£225.00	(£269.08)
MMA3993	Courier-1 ISDN/V34 Internal	£225.00	(£269.08)
DMD3832	3Com Megahertz 56K* Global PCMCIA Modem	£109.00	(£172.19)



\* All 56K products are capable of download speeds up to 56Kbps, however due to varying line conditions, the actual download speeds may be lower. Requires connectivity to an analogue telephone line which is compatible with 56K technology.

## V.90 STANDARD MODEMS

**NEW! 3Com 56K V.90 Fax Modem**  
As low as **£59**  
(£69.33)  
DMD4037

Online Any Time, Any Place for Everyone  
The 3Com U.S. Robotics 56K Fax-modem offers high-speed online access, for increased productivity and enhanced Internet experience.

**3Com 56K V.90 Global Modem PC Card**

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(£128.00)  
DMD3832

The New 3Com PC Card gives you reliable, hassle-free connections around the world with download speeds up to 56Kbps using x2™ technology. Approved for use in over 100 countries and regions.

## OfficeConnect™ FAMILY

## 3Com Etherlink III Cards

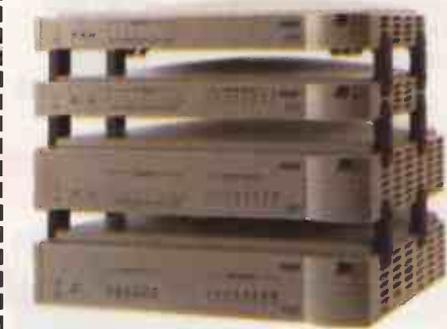
The OfficeConnect™ products provide extensive networking capabilities for small offices wanting to share computer and information resource, and for remote branch offices needing enterprise-level functionality.



High Performance Etherlink III Adapters  
from only **£26.80** (£31.49) each based on 20 pack DEC1475



3Com Part #	1 Single	5 Pack	20 Pack
3C509BTP0	DEC1473	DEC1474	DEC1475
EtherLink III UTP only	£30.99 (36.41)	£145.99 (171.54)	£535.99 (629.79)
3C509BTP	DEC1470	DEC1471	DEC1472
EtherLink III UTP/AUI	£57.99 (68.14)	£242.99 (285.51)	£869.99 (1022.24)
3C509B Combo	DEC1477	DEC1478	DEC1479
EtherLink III Combo	£63.95 (75.14)	£279.95 (328.94)	£1049.00 (1232.58)
3C509BTPC	DEC2425	DEC2426	DEC2427
EtherLink III BNC/UTP	£36.95 (43.42)	£175.95 (206.74)	£679.95 (798.94)
3C905-TX	DEC2338	DEC2340	DEC2339
FastEtherLink 10/100 PCI	£49.99 (58.74)	£239.99 (281.99)	£869.00 (1021.08)
3CCE589ET	DEC3577	DEC3582	DEC3676
Megahertz RJ45 LAN Card	£71.99 (84.59)	£349.00 (410.08)	£1359.00 (1596.83)
3CCE589EC	DEC3578	DEC3585	-
Megahertz RJ45/BNC LAN Card	£97.99 (115.14)	£459.00 (539.33)	-



DEH2289	OfficeConnect Hub TP4	£26.99 (£31.63)
DEH1721	OfficeConnect Hub 8 TPO	£44.99 (£52.86)
DEH1720	OfficeConnect Hub 8 TPC	£59.99 (£70.49)
DEH1719	OfficeConnect Hub 8TPM	£192.99 (£226.76)
DEH3670	OfficeConnect Dual Speed 10/100 8 port hubs NEW!	£159 (£186.83)
DEH3227	OfficeConnect Hub TP400 4 100BTX Ports	£59 (£69.33)

**3COM MEGAHERTZ 10/100 + 56K MODEM**

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(£199.74)  
DMD3583

- Reliable, hassle-free, standards-based access and high-speed downloads anytime, anywhere
- Simultaneous LAN and modem access with Parallel Tasking technology for LAN throughput up to 46 percent faster than PC Cards without it.

**The OfficeConnect Networking Kit**

Only **£65**  
(£76.38)  
DEH3715

- New 4 Port Kit
- Contains everything you need to connect 2 PCs plus room to connect 2 more

\* See page 32 for Terms & Conditions



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<b>SCSI I - I</b>				
Centronics 50 (M) - Centronics 50 (M)	0.5m	ACC1296	£6.95	(£8.17)
Centronics 50 (M) - Centronics 50 (M)	1.0m	EURAC3670	£9.95	(£11.69)
Centronics 50 (M) - Centronics 50 (M)	2.0m	EURAC3669	£10.95	(£12.87)
Centronics 50 (M) - Centronics 50 (M)	3.0m	EURAC3671	£15.95	(£18.79)
Centronics 50 (M) - Centronics 50 (F)	1.0m	EURAC3672	£12.95	(£15.22)
Centronics 50 (M) - Centronics 50 (F)	2.0m	EURAC3673	£15.95	(£18.74)
Centronics 50 (M) - DB25 (M)	1.0m	EURAC2158	£8.95	(£10.61)
Centronics 50 (M) - DB25 (M)	2.0m	EURAC3674	£19.95	(£23.44)

#### SCSI II - I

Mini - 50 SCSI II (M) - Centronics 50 (M)	0.5m	DCA2170	£10.95	(£12.87)
Mini - 50 SCSI II (M) - Centronics 50 (M)	1.0m	EURAC3700	£19.95	(£23.44)
Mini - 50 SCSI II (M) - Centronics 50 (M)	2.0m	EURAC3675	£25.95	(£30.49)
Mini - 50 SCSI II (M) - Centronics 50 (M)	3.0m	DCA2650	£29.95	(£35.19)

#### SCSI II - II

Mini - 50 SCSI II (M) - Mini - 50 SCSI II (M)	0.5m	DCA2173	£16.95	(£19.92)
Mini - 50 SCSI II (M) - Mini - 50 SCSI II (M)	1.0m	DCA2659	£22.95	(£27.37)
Mini - 50 SCSI II (M) - Mini - 50 SCSI II (M)	2.0m	DCA2657	£29.95	(£35.19)
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#### USB CABLES

Description	Order No.	Price	Incl. Vat
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USB cable, plug A to plug B, 3 metre	DCA3135	£5.49	(£6.53)
USB cable, plug A to plug B, 5 metre	DCA3745	£7.59	(£9.00)
USB cable, plug A to plug A, 2 metre	DCA3749	£6.95	(£8.17)
USB cable, plug A to plug A, 3 metre	DCA3130	£7.95	(£9.34)
USB cable, plug A to plug A, 5 metre	DCA3748	£12.95	(£15.21)
USB Hub (4 ports)	DEH3906	£49.95	(£58.69)
USB to Parallel Adapter	DAD1563	£39.99	(£46.99)

#### CATS SHAGLESS PATCH CABLES

Length	Price Each	Incl. Vat	Price 10+	Incl. Vat	Gray
0.5m	£3.89	(£4.57)	£35.90	(£42.18)	DCA4645
1m	£4.29	(£5.04)	£38.90	(£45.71)	DCA3658
2m	£4.69	(£5.51)	£42.90	(£50.41)	DCA4040
3m	£5.49	(£6.45)	£49.90	(£58.83)	DCA2240
5m	£5.99	(£7.04)	£53.90	(£63.33)	DCA4650
10m	£8.99	(£10.59)	£80.90	(£95.86)	DCA4961
15m	£10.99	(£12.91)	£98.90	(£116.21)	DCA2246
30m	£19.95	(£23.44)	£179.90	(£211.30)	DCA2247

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#### IEEE BIDIRECTIONAL PRINTER CABLES

Length	Order No.	Price	Incl. Vat
<b>A-B DB25-CDB Cable</b>			
2m	DCA3869	£6.49	(£7.63)
3.0m	DCA3869	£9.99	(£11.74)
5m	DCA3870	£16.49	(£19.38)
<b>A-C DB25-Mini CDB Cable</b>			
2m	DCA3871	£11.49	(£13.50)
3.0m	DCA3872	£14.99	(£17.61)
5m	DCA3915	£21.49	(£25.25)
<b>A-A DB25-DB25 Cable</b>			
2m	DCA3911	£6.49	(£7.63)
3.0m	DCA3912	£9.99	(£11.74)
5m	DCA3867	£16.49	(£19.38)

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Cable connector	Length (m)	Order No.	Price	Incl. Vat
DB25F/DB25M	2	DCA0002	£4.99	(£5.86)
DB25M/DB25M	2	DCA0006	£3.99	(£4.69)
DB25M/DB25M	3	DCA0007	£5.49	(£6.45)
DB9F/DB25M	2	EURAC2256	£4.99	(£5.86)
DB9F/DB25M	5	EURAC2258	£9.49	(£11.15)

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Order No.	Description	Price	Incl. Vat
<b>Power Cables</b>			
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DCA2164	Power Supply T Cable	£1.99	(£2.34)
DCA2163	Extension Cable	£1.99	(£2.34)

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DCA3923	IEC-Mains Cable 2m	£4.49	(£5.28)
DCA4083	IEC-Mains Cable 3m	£6.49	(£7.63)
DCA4084	IEC-Mains Cable 6m	£6.99	(£8.17)

#### IEC M-F Mains Cables

DCA2900	IEC M-F 2m	£4.49	(£5.28)
DCA4085	IEC M-F 3m	£6.49	(£7.63)
DCA4086	IEC M-F 6m	£12.49	(£15.05)

#### SCSI II Internal Ribbon Cables

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DCA3914	w/4 x IDC 50c-45cm	£4.49	(£5.28)
DCA3918	w/5 x IDC 50c-45cm	£6.49	(£7.63)
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If you purchase Office 97 or any Office 97 application between January 1, 1999 and July 31, 1999, the Microsoft Office Technology Guarantee allows you to upgrade to the corresponding Office 2000 suite or application, when available, for the cost of shipping, handling and media (£10.00 for an individual application and £15.00 for Office). For further information and full terms and conditions telephone the Microsoft Connection on 0324 00 2000 or check out [www.microsoft.com/uk/office](http://www.microsoft.com/uk/office)

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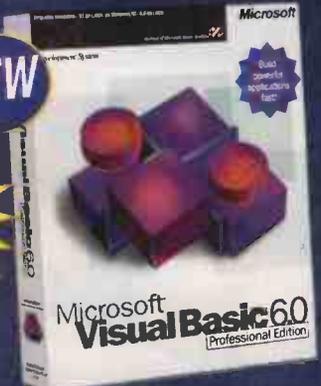
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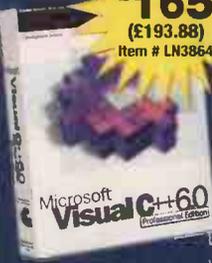
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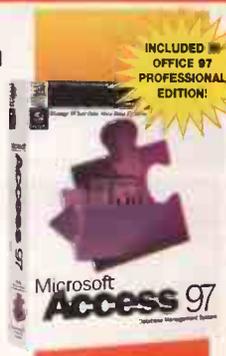
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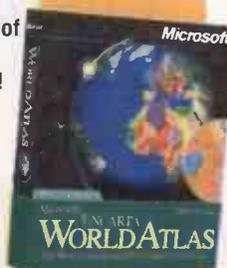
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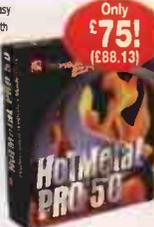


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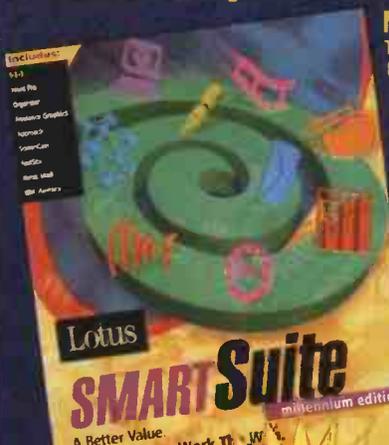


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Lotus cc:Mail R8.3 Advanced System Pack CD  
CM3490 ..... £329 (€386.58)  
Lotus cc:Mail R8.3 Advanced System Pack Upg CD  
CM3289 ..... £229 (€269.07)

#### Lotus Domino 4.6 Server

Lotus Domino is an applications and messaging server with an integrated set of services to let you create secure, interactive business solutions for the Internet, corporate intranets and extranets.

With Domino™, you can rapidly build, deploy and manage applications that help co workers, partners and customers collaborate and coordinate critical business activities on-line. Domino supports a variety of clients and devices, including Web browsers, Notes clients, POP3 and JMAP4 mail clients.

Lotus Domino Server V4.6 Single Processor CD  
CM3118 ..... £1149 (€1350.08)  
Lotus Domino Server Upgrade V4.6 for Single Processor CD  
CM3121 ..... £699 (€821.33)

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## Dragon NaturallySpeaking



NEW Mobile



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It includes Dragon NaturallySpeaking Preferred software, the ergonomic, hand-held Dragon NaturallyMobile™ digital recorder—the first recorder specifically designed for speech recognition—special linking software, and a high-quality headset microphone for use with your PC. The Dragon NaturallyMobile recorder holds up to 40 minutes of continuous speech in its built-in memory, and up to 80 additional minutes on available removable memory cards. Just press "Record" and speak naturally into the recorder. To review your dictation, play it back using the built-in speaker. Back at the office, attach the recorder to your PC, select the recording, click "Transcribe", and your dictation is immediately, automatically transcribed.

#### HERE'S HOW SIMPLE IT IS TO USE

1. Press "Record" button and speak into the recorder's built-in microphone.
2. Connect the recorder to your PC using the included cable.
3. Select which recordings you want transferred to the PC.
4. Press "Transcribe" and your recorded speech appears as text on your screen and in your document.

Requires: PC or compatible running at 133MHz minimum (200MHz recommended); Windows 98, 95, or NT 4.0; 32MB RAM minimum (64MB recommended) for Windows 95/98; 48MB RAM for Windows NT 4.0; BestMatch technology requires 200MHz and 48MB RAM; 180MB free hard disk space (240MB recommended); 16-bit sound card or built-in audio system.

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Dragon Naturally Speaking STD 3.0 Win9X/NT CD	BS11603	£68 (€79.90)
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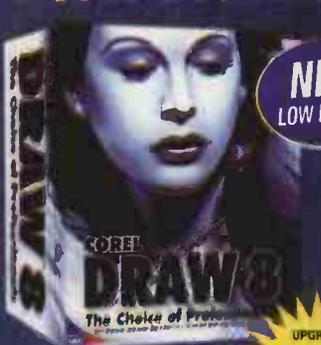
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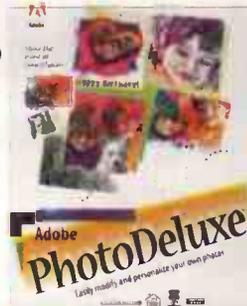
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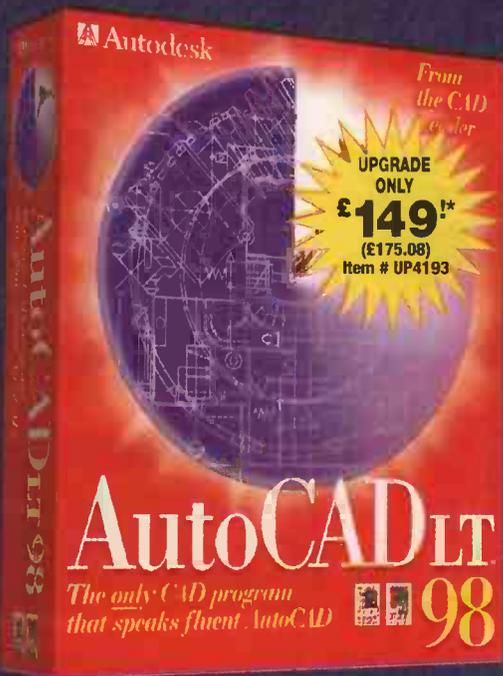


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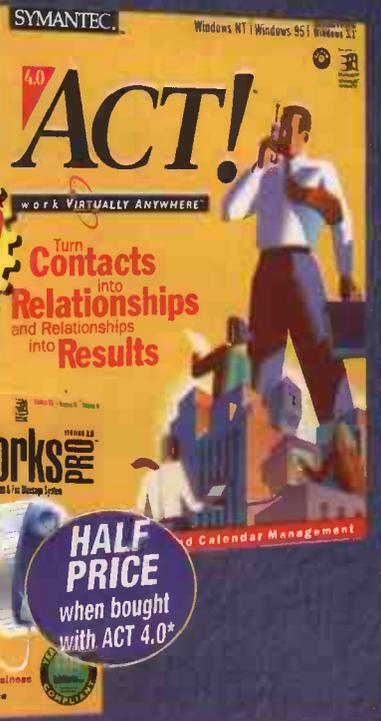
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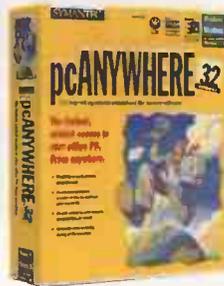
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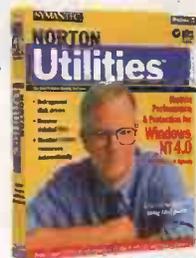


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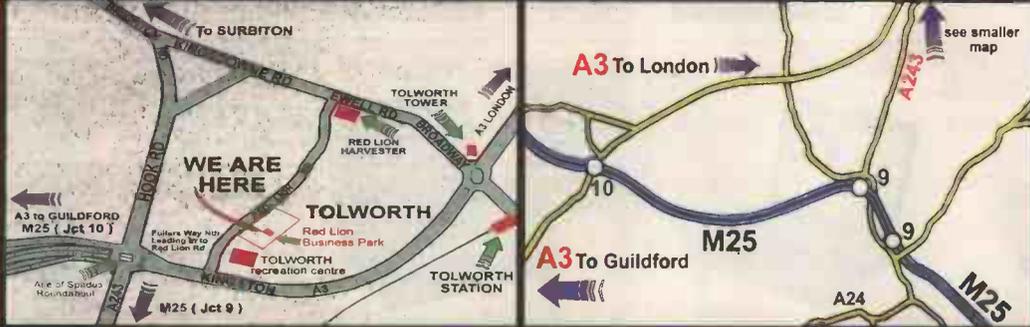
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Sat Pro 490CDT	£1329	£1561.57
Sat Pro 490XCDDT	£1489	£1749.57
Portege 7010CT	£1899	£2231.32
Tecra 8000-A	£1329	£1561.57
Tecra 8000-B	£1489	£1749.57
Tecra 8000-C	£1989	£2337.07
Tecra 8000-D	£2245	£2637.87
Tecra 8000-E	£2659	£3124.32

## COMPAQ WHICH COMPAQ ARMADA IS RIGHT FOR YOU?



### Armada 1700 Series



### Armada 6500 Series



### Armada 7800 Series

The Armada 1700 offers the latest key technologies. The advanced MultiBay design supports an optional second hard drive, LS120 SuperDisk drive, Zip drive or DVD drive. These can be configured in seconds to help store, manage and transfer information.

The Armada 6500 is a slim notebook offering a large 14.1" display for impressive 'off the screen' presentations. The internal MultiBay supports CD-ROM drive, FDD, DVD drive, LS120 SuperDisk drive or a second HDD.

For users requiring the highest performance the Armada 7800 narrows the gap between desktop and mobile computing by offering the largest hard drives, screens and memory expansion options of the entire Compaq Armada product range.

- Pentium II 233 Model**
- PII 233MHz, 32Mb SDRAM, 4GB Hard drive
  - 12.1" CRTFT XGA
  - 24x CD-ROM standard (optional DVD-ROM drive)
  - Optional 2nd L-Ion battery
  - Optional 56K flex modem
  - MS Windows 95 or Windows 98

- Pentium III 300 Model**
- PII 300MHz, 64Mb SDRAM, 6.4GB Hard drive
  - 14.1" CRTFT XGA
  - 24x CD-ROM standard
  - Integrated 56K modem
  - Network connection: Integrated 10/100Mb/S
  - MS Windows 95

- Pentium III 300 Model**
- PII 266MHz, 64Mb SDRAM, 5GB Hard drive
  - 13.3" CRTFT XGA
  - 20x CD-ROM, 1.44Mb FDD standard
  - Optional 2nd HDD, 2nd L-Ion battery
  - DVD-ROM drive, LS-120 drive
  - MS Windows 95 or Windows NT

Armada 68 Series	P233MMX 4.0 32 13.3	£1139	£1338.32
Armada 1700 Series	PII233MHz 4.0 32 12.1	£1149	£1350.07
	PII233MHz 4.0 32 12.1	£1149	£1350.07
	PII266MHz 4.0 32 13.3	£1499	£1761.32
	PII300MHz 5.0 32 14.1	£1849	£2172.57
Armada 3500	PII266MHz 4.1 32 12.1	£1629	£1914.07
	PII266MHz with NT 4	£1675	£1968.12
	PII300MHz 6.4 64 13.3	£2119	£2489.82
	PII300MHz with NT 4	£2159	£2536.82
Armada 6500 Series	PII300MHz 6.4 64 14.1	£2689	£3159.57
	PII300MHz with NT 4	£2739	£3218.32
Armada 7400 Series	PII266MHz with NT 4	£2119	£2489.82
	PII300MHz 6.4 64 13.3	£2475	£2908.12
	PII300MHz with NT 4	£2559	£3006.82
Armada 7800 Series	PII 266MHz 5.0 64 13.3	£2029	£2384.07
	PII 266MHz 5.0 64 13.3	£2075	£2438.12
	PII 266MHz 8.0 64 14.1	£2385	£2802.37
	PII 266MHz 8.0 64 14.1	£2425	£2849.37
	PII 300MHz 8.0 64 14.1	£2649	£3112.57
	PII 300MHz 8.0 64 14.1	£2689	£3159.57

# UMAX

UMAX have a strong background in the computer industry, and the new ActionBook series of notebooks have been designed specifically for power users in consumer, SOHO and mainstream corporate markets whilst maintaining UMAX's reputation for quality products at exceptional prices.

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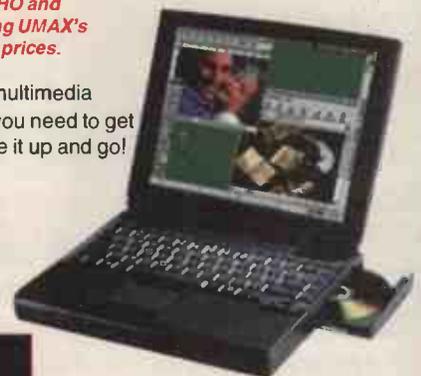
**ActionBook 330T:** is the most advanced "all-in-one" solution available for multimedia applications. Whether it's for business or pleasure, 330T gives you the performance you need to get your work done fast and play hard. Everything is built-in and ready to use. Just charge it up and go!

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- 12.1" SVGA TFT Active Matrix Colour Display (800 x 600 resolution)
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- 4.0GB Hard Disk Drive
- 24X CD-ROM Drive
- Built-in 3D Audio with Microphone and Stereo Speakers
- Interface: USB Port, Serial Port, PS/2 Type Port, VGA Port, IR Port, Audio Out, Microphone In

UMAX ActionBook 330T  
£855 ex vat  
£1004.62 inc vat

### Accessories:

- |                      |      |      |
|----------------------|------|------|
| 32Mb upgrade         | Call | Call |
| 64Mb upgrade         | Call | Call |
| PCMCIA 56k Fax Modem | Call | Call |



## Acer A fresh perspective.



### TravelMate 310 from

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£880.07 inc vat



### Extensa 500 from

£849 ex vat  
£997.57 inc vat



### Extensa 710 from

£1175 ex vat  
£1380.62 inc vat

The TravelMate 310 series notebooks are under half the size and half the weight of conventional notebooks with all the features and performance you'd expect from a full size notebook.

- Small portable sub-notebook
- Full Microsoft Win 95, 98 & NT compliant
- Feature rich but compact and light

The new Extensa 500 Series notebooks encompass convenient "all-in-one" features and state-of-the-art audio technology, with "PlayNow" design for playback of music CD's with system on or off.

- All-in-one modular design, Inc FDD, HDD & CD-ROM
- State-of-the-art audio technology, with "PlayNow" design for playback of music CD's with system on or off
- Heuristic Power Management for longer battery life
- Integrated 56Kbps modem

The new Extensa 710 series - convenient "all-in-one" features, a Pentium III processor, and up to 5 hours battery life makes this the perfect notebook PC.

- Modular system for fast & efficient switching of devices - CD-ROM, DVD-ROM, LS-120, 2nd FastBack HDD
- Heuristic Power Management for longer battery life
- Network ready docking station and LDCM support
- 13.3" XGA TFT display for high quality resolution (TE)

312T	P233MMX 32MB 3.2GB ext 24x max 8.4TFT 56K	£1049	£1232.57
312D	P233MMX 32MB 3.2GB 8.0DSTN 56K	£749	£880.07
312DC	P233MMX 32MB 3.2GB ext 24x max 8.0DSTN 56K	£849	£997.57
313T	P266MMX 32MB 3.2GB ext 24x max 8.4TFT 56K	£1169	£1373.57
500DX	P233MMX 32MB 2.1GB 20x max 12.1HPA DSN 56K	£849	£997.57
500T	P233MMX 32MB 3.2GB 20x max 12.1TFT 56K	£949	£1115.07

501T	P266MMX 32MB 3.2GB 20x max 12.1TFT 56K	£849	£997.57
710T	PII 233 32MB 3.2GB 24x max 12.1TFT 56K	£1169	£1373.57
710TE	PII 233 32MB 4.0GB 24x max 13.3TFT 56K	£1169	£1373.57
711TE	PII 266 64MB 4.0GB 24x max 13.3TFT 56K	£1169	£1373.57
712TE	PII 300 64MB 6.0GB 24x max 13.3TFT 56K	£1169	£1373.57
712TEV	PII 300 64MB 6.0GB 2x DVD/MPGHI 13.3TFT 56K	£1169	£1373.57

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8949	£1115.07
8949	£1115.07
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**NEUTRON MMO**

- Intel Mobile Module Processor with MMX
- Intel Triton 82430 TX Chipset - PCI Bus
- 12.1" SVGA (1024 x 768) TFT Display
- 32Mb SDRAM (Upgradeable)
- 512Kb Level 2 Cache
- 2.1GB Toshiba E-IDE Hard Drive (Upgradeable)
- 24 x CD-ROM & 1.44Mb FDD
- 16 Bit Stereo Sound with Wavetable & SRS 3D Sound
- 2 PCMCIA Type II or 1 Type III Slot
- Lithium Ion battery
- USB Port
- Weight 2.9Kg
- Dimensions 303 x 234 x 51.5mm
- MS Windows 95 Pre-loaded & on CD
- Lotus Smartsuite Software bundle
- International AC Adapter
- Deluxe Carry Case
- 1 Year Worldwide Warranty (Courier Collect & Return)

**NEUTRON PII**

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- Intel Triton 82430 TX Chipset - PCI Bus
- 12.1"/13.3" SVGA (1024 x 768) TFT Display
- 80Mb SDRAM (Upgradeable)
- 512Kb Level 2 Cache
- 4.1GB Toshiba E-IDE Hard Drive (Upgradeable)
- 24 x CD-ROM & 1.44Mb FDD
- 16 Bit Stereo Sound with Wavetable & SRS 3D Sound
- 2 PCMCIA Type II or 1 Type III Slot
- Lithium Ion battery
- USB Port
- Weight 2.9Kg
- Dimensions 303 x 234 x 51.5mm
- MS Windows 95 Pre-loaded & on CD
- Lotus Smartsuite Software bundle
- International AC Adapter
- Deluxe Carry Case
- 1 Year Worldwide Warranty (Courier Collect & Return)

**PHOTON PII AGP**

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- 512Kb Level 2 Cache
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- 16 Bit Stereo Sound with Wavetable & SRS 3D Sound
- 2 PCMCIA Type II or 1 Type III Slot
- Lithium Ion 45W Battery
- USB port
- Dimensions 316 x 250 x 34mm
- MS Windows 95 Pre-loaded & on CD
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- International AC Adapter
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**NEUTRON PII**  
 PII 266 MMO  
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**NEUTRON MMO RANGE**  
 P266 MMO

**PHOTON PII RANGE**  
 PII 266 MMO  
 PII 300 MMO

ex vat	inc vat	ex vat	inc vat
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£1299	£1526.32	£1499	£1761.32
£1399	£1643.82	£1549	£1820.07

<b>12.1" TFT SCREEN</b>	
£1049	£1232.57

<b>14.1" TFT SCREEN</b>	
£1699	£1996.32
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Neutron P266 MMO £1049 - £104.90 deposit. Then after 6 months pay £944.10 & no interest or choose to repay by 36 payments of £33.27 Total repayable £1198.06 A.P.R.26.9% Finance subject to status written quotation available on request.

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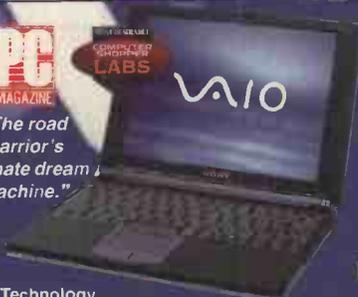
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### The 700 Series

- Pentium 266 MHz with MMX Technology
- 32-128Mb SDRAM
- 3.2GB/4.3GB Hard Drive
- 12.1" TFT Colour display
- Multi-purpose drive bay for CD-ROM, Floppy drive or optional second battery
- Built-in 56K/ GSM ready/ ISDN ready/ Ethernet ready fax Modem
- Built in Speakers, microphone for multimedia applications
- Lithium-ion battery, Windows 98 pre installed
- Dimensions: 297 x 38 x 214mm (W x H x D) - Weight 2.5kg

### The 505 Series - The World's Thinnest Notebook

- Pentium 266 MHz with MMX Technology
- 32-96Mb SDRAM
- 4.3GB Hard Drive
- 10.4" TFT Colour display (800 x 600 dpi)
- External CD-ROM drive / Floppy drive (505fx-tx only)
- Built-in 56K/ GSM ready/ ISDN ready/ Ethernet ready fax Modem
- Cables required for above: GSM £75 + vat, ISDN £89 + vat, (505fx-tx only)
- 16-bit Sound Blaster compatible "SONY" MPEG1 Digital Video with full screen play-back, Built in Microphone, 1 built in Speaker
- PC Card 1x type II
- Lithium-ion battery, Windows 98 pre installed
- Dimensions: 259 x 23.9 x 208mm - Weight: 1.35kg

Model	Processor	RAM/Max	HD	CD-ROM	Display	Modem	ex vat	inc vat
VAIO 745	266MHz P/MMX	32/128Mb	3.2GB	YES	12.1" HPA	No	£629	£974.07
VAIO 747	266MHz P/MMX	32/128Mb	4.3GB	YES	12.1" TFT	56K	£1275	£1498.12
VAIO 505fx-tx	266MHz P/MMX	32/96Mb	4.3GB	Ext	10.4" TFT	56K	£1699	£1996.32
VAIO 505fx-lite	266MHz P/MMX	32/96Mb	4.3GB	NO	10.4" TFT	No	£1389	£1632.07

Optional CD ROM Drive/Optional Purple Mouse/Optional 64Mb RAM Available Please Call for details.

## SHARP

- Pentium 266MMX
- 64Mb RAM
- 4.3GB Hard Drive
- 11.3" active matrix LCD
- Dimensions: 259 x 206 x 21.2mm
- USB port, VGA monitor port, & an expansion Bus (included) for a combined FDD, serial, printer and mouse/keyboard port.

### SHARP ULTRALITE NOTEBOOKS

PCA 150 Ultra Lite Notebook excluding CD player	£1369	£1608.57
PCA 150 as above plus PCMCIA CD player	£1519	£1784.8
PCA 150 as above except P233 3.2HD no CD	£1599	£1878.82
PCA 100B as above except P233 3.2HD with CD	£1699	£1996.32

The PC-A150 UltraLite sets the standard for a new class of lightweight notebook. The fully featured B5 sized PC weighs just 1.4kg & is less than one inch thick. It is the only machine in its class to offer a super bright 11.3" SVGA TFT display & a CRT port on the main unit for presentations. It is designed for mobile professionals looking for full computing power with an ultra-light form-factor with an extended battery life of up to 8.5 hours. Measuring 259x206x21.2mm, it is one of the thinnest, most portable yet fully featured products on the market. It offers a USB port, VGA monitor port, & an expansion Bus (included) for a combined FDD, serial, printer & mouse/keyboard port. These features, combined with an 89% sized keyboard and a powerful 266MHz Pentium processor with MMX technology, give users a full-featured, mobile computing solution, in a very lightweight & compact package. The PC-A150 includes a revolutionary Sharp 11.3" SVGA TFT LCD screen. The screen, which shows more than 16.7 million colours, is the largest screen available in the B5 notebook class & is ideal for presentations and multimedia. It also comes with 64Mb of EDO RAM & a 4.3GB hard drive for maximum power in its class. It is supported by a three year courier collect & return service at Sharp's cost in the UK, 3 year RTB Europe & 1 year RTB International.

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### HC-4600A

- 16Mb RAM
- 6.5" Colour screen
- 410g weight
- NiMH battery
- Touch screen with pen
- 1 Type II PCMCIA slot
- 32Mb Version £459 + vat



### SHARP HC-4600A

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The ECHOS 1200 is our top selling entry level notebook. It boasts an array of features all backed by the build quality you have come to expect from the Olivetti brand. The ECHOS 1200 is closely followed by the Xtrema Pentium MMX models.

1200 200MMX 12.1" TFT 2.0GB 20X 32MB 2MBVRAM	£849	£997.57
P26S 266MMX 12.1" TFT 2.1GB 24X 32MB 2MBVRAM	£999	£1173.82

Olivetti also offer a comprehensive range of accessories for both the ECHOS & the Xtrema series. Please call us for pricing or more details on any of the following:  
MultiMedia Docking station, Port Replicator, memory expansion modules, Car adapter, carrying cases or extra battery packs.

Xtrema is our top-of-the-range notebook, featuring Intel's Pentium® MMX™ technology and Pentium® II processors, making it the perfect multimedia and communications desktop alternative for the executive on the move.

323S PII233 12.1" TFT 2.1GB 24X 32MB 2MBVRAM	£1049	£1232.57
423S PII233 12.1" TFT 3.0GB 20X 32MB 2MBVRAM	£1249	£1467.57
426S PII266 12.1" TFT 4.0GB 20X 32MB 2MBVRAM	£1349	£1585.07

423X PII266 13.3" XGA 3.0GB 20X 32MB 2MBVRAM	£1299	£1526.32
426X PII266 13.3" XGA 6.0GB 20X 64MB 2MBVRAM	£1559	£1831.82
426X PII300 13.3" XGA 6.0GB 20X 64MB 2MBVRAM	£1799	£2113.82

## ThinkPad

### Extreme performance and technology

Once again IBM leads the way by engineering the industry's most advanced technology into one sleek notebook - new ThinkPad 770 models include Intel Mobile Pentium III processors at 300MHz, up to an incredible 8.1Gb Internal storage (upgradable to 16.2Gb with a second 8.1Gb hard disk drive), up to 128Mb standard high-speed SDRAM memory and more.

Model	Processor	RAM	HD	CD-ROM	Display	Modem	ex vat	inc vat
TP380-HGO	PII233 32MB 4.0GB 13" TFT CD	£1549	£1820.07					
TP380-JGO	PII300 32MB 4.0GB 13" TFT CD	£1899	£2231.32					
TP380-FAO	PII266 32MB 5.0GB 12" TFT	£1799	£2113.82					
TP560-900	PII233 32MB 4.0GB 12.1" TFT	£1499	£1761.32					
TP560-B00	PII300 64MB 6.4GB 12.1" TFT	£2049	£2407.57					
TP600-410	PII233 32MB 3.2GB 13" TFT CD	£2249	£2642.57					
TP600-510	PII266 32MB 4.0GB 13.3" TFT CD	£2499	£2938.32					
TP600-450	PII300 64MB 5.0GB 13" TFT CD	£2649	£3112.57					
TP600-550	PII300 64MB 6.4GB 13" TFT CD	£2849	£3347.57					
TP770-510	PII266 32MB 5.1GB 14.1" TFT	£2449	£2877.57					
TP770-5A0	PII266 64MB 8.1GB 14.1" TFT DVD	£2999	£3523.82					
TP770-710	PII300 64MB 8.0GB 13" TFT DVD	£3199	£3758.82					
TP770-7A0	PII300 128MB 8.0GB 13" TFT CD	£3375	£3965.82					
TP770-7B0	PII300 128MB 8.0GB 13" TFT DVD	£3349	£3935.07					



## HEWLETT PACKARD

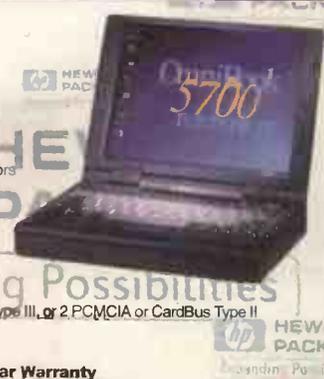
### Expanding Possibilities

### OmniBook 5700

- Intel Pentium 166 MMX processor
- 32-bit PCI Bus architecture
- Cache 32 KB Level 1 on MMX processors
- 12.1" SVGA TFT
- 20 x CD ROM drive (optional for £100+vat)
- 2.0Gb Enhanced-IDE hard drive
- Removable 3.5" 1.44Mb drive
- 16Mb of enhanced Fast Page RAM
- PC card Slots 1 PCMCIA or CardBus Type III, or 2 PCMCIA or CardBus Type II
- Windows 95
- TrackPoint III pointing device

### HP's legendary WorldWide 3 Year Warranty

HEWLETT PACKARD 5700	£799 ex vat	£938.83 inc vat
HEWLETT PACKARD 5700CD	£899 ex vat	£1056.33 inc vat



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### BABY ZIP

Portable Zip Drive

**KEY FEATURES**

- Powered directly from computer
- Uses standard omega 100Mb Zip disks
- PCMCIA connection or optional parallel port cables
- 16 bit data transfer - up to 3.3Mb/sec
- Automatic media verification during format
- No specific drivers required (Win 95), real Plug & Play

2.1 - 4.2GB ~~£239~~ £186.82  
 3.2 - 6.4GB ~~£299~~ £234.44  
 4.0 - 8.0GB ~~£299~~ £234.44  
 6.4 - 12.8GB ~~£349~~ £269.99  
 10.0 - 20GB ~~£499~~ £389.99

### FLIP DISK

Portable Hard Drive

**KEY FEATURES**

- No Power or interface cables required
- Instantly Increase your hard disk capacity
- PCMCIA interface - Plug & Play
- Up to 12.8GB using Novadisk compression software
- Store & run programs & files
- Transfer data between Laptop or Desktop\*

\*Requires optional Parallel port cables

Novadisk Software ~~£19.95~~ £14.95  
 Parallel/Power Cables ~~£29.95~~ £23.95

### BRAVO DRIVE

Portable CD ROM & Audio Player

**KEY FEATURES**

- 20 Speed Unit
- No need for bulky mains adaptors, powered from your computer
- Mobile Audio CD player
- Fully hot swappable
- Up to 3Mb/sec (20 speed unit)
- Easy to install software drivers
- Can also be used with mains adaptor or 6 AA batteries (not supplied)

£144 £169.20

## EZCD

Portable Drives Parallel Port & PCMCIA

EZCD Parallel X32	£84	£98.70
EZCD Parallel X40	£88	£103.40
EZCD Parallel Sound X40	£134	£157.45
EZCD Card PCMCIA X32	£98	£115.15
EZCD Card PCMCIA X40	£104	£122.20
BABY CD 24X PCMCIA	£99	£116.32

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## PSION SERIES 5

Take your office wherever you go. The PSION SERIES 5 gives you the computing power you need without the excess weight. With a fully featured, built in time manager, contact database, voice recorder and drawing package, the SERIES 5 is as valuable personally as it is professionally.

4MB	£285	£334.87
8MB	£289.99	£340.73

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**320LX Just £159 +vat**  
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3 Year next-day exchange warranty	£59	£69.32
Pack of 3 spare pens	£6	£7.05
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Compact Flash 2Mb inc adapter	£59	£69.33
Compact Flash 4Mb inc adapter	£89	£104.58
HP 320LX Palmtop PC	£159	£186.82
HP 360LX Palmtop PC	£339	£398.32
HP 620LX Palmtop PC	£469	£551.07

## SIEMENS NIXDORF

The Siemens Nixdorf SCENIC Mobile 710 notebook provides the ultimate high end multimedia notebook solution. Unique Pro view model comes with detachable screens allowing you to deliver professional presentations in conjunction with an OHP display unit. You simply remove the 12.1" TFT SVGA display, place it on the projector and start your presentation. The projector in combination with Full screen/Full motion MPEG video playback and stereo audio function gets your message across in a big way!!

P233MMX 3.0Gb 12.1" 32Mb 20x	£2199	£2583.82
P233MMX 3.0Gb 12.1" 32Mb 20x	£2299	£2701.32

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## NOVAMAX Storage Products For Notebooks

### Nova - cdMAX

Lightest Smallest 20X CD-ROM Audio 'Diskman' Style Function High Speed Data Transfer 3.3Mb/s

£139 £163.32

### Nova - zipMAX

Compact Design, Pocket Size ZIP Drive Works With All Manufacturers ZIP100 Disks Data Transfer As Fast As A Notebook HDD

£159 £186.82

### Nova - PROMAX

Pocket Size Design Mobile Hard Drive Large True Capacity 8Gb Plus High 16Bit Data Transfer 3.3Mb/s +

3.0GB	£279	£327.82
4.0GB	£299	£351.32
6.0GB	£399	£468.82
8.0GB	£649	£762.57

ALL NOVAMAX PRODUCTS ARE: PCMCIA TYPEII COMPATIBLE, WINDOWS 95 PLUG AND PLAY AND COVERED BY FREE TECHNICAL SUPPORT AND A 3 YEAR WARRANTY

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Our Corporate Team are the best in the business. If you are an IT Manager with a budget in excess of £50K per annum we will provide you with your own dedicated account manager. Tech Direct have the focus, resource & expertise to meet your demands. Our Corporate account managers will understand your specific needs, providing the quality service you require. Just call 0181 286 2277 to speak directly to an experienced Corporate account manager.

### notebook upgrades from

NOVAMAX notebook hard drive upgrades are 100% compatible & in the case of the "RM" options, include the removable carriers. If your model is not listed please contact sales for further information. NOVAMAX drives include three year warranty.

	2.1Gb	3.0Gb	4.0Gb	5.0Gb	RM
<b>COMPAQ OPTIONS</b>					
Armada 1500 Series	•	•	•	•	•
Armada 4000 Series	•	•	•	•	•
Armada 7000 Series	•	•	•	•	•
Contura Series	•	•	•	•	•
LTE Elite Series	•	•	•	•	•
LTE 5000 Series	•	•	•	•	•
<b>IBM OPTIONS</b>					
ThinkPad 310 Series	•	•	•	•	•
ThinkPad 350 Series	•	•	•	•	•
ThinkPad 355 Series	•	•	•	•	•
ThinkPad 360 Series	•	•	•	•	•
ThinkPad 365 Series	•	•	•	•	•
ThinkPad 370 Series	•	•	•	•	•
ThinkPad 380 Series	•	•	•	•	•
ThinkPad 560 Series	•	•	•	•	•
ThinkPad 600 Series	•	•	•	•	•
ThinkPad 701 Series	•	•	•	•	•
ThinkPad 750 Series	•	•	•	•	•
ThinkPad 755 Series	•	•	•	•	•
ThinkPad 760 Series	•	•	•	•	•
ThinkPad 765 Series	•	•	•	•	•
ThinkPad 770 Series	•	•	•	•	•
<b>TOSHIBA OPTIONS</b>					
Portege 300 Series	•	•	•	•	•
Portege 610 Series	•	•	•	•	•
Portege 660 Series	•	•	•	•	•
Satellite 100 Series	•	•	•	•	•
Satellite 110 Series	•	•	•	•	•
Satellite 200 Series	•	•	•	•	•
Satellite 220 Series	•	•	•	•	•
Satellite Pro 400 Series	•	•	•	•	•
Satellite Pro 410 Series	•	•	•	•	•
Satellite Pro 420 Series	•	•	•	•	•
Satellite Pro 430 Series	•	•	•	•	•
Satellite Pro 440 Series	•	•	•	•	•
Satellite Pro 460 Series	•	•	•	•	•
Satellite Pro 480 Series	•	•	•	•	•
T1900 Series	•	•	•	•	•
T2100 Series	•	•	•	•	•
T2400 Series	•	•	•	•	•
T3400 Series	•	•	•	•	•
T3600 Series	•	•	•	•	•
T4000 Series	•	•	•	•	•
Tecra 510 Series	•	•	•	•	•
Tecra 520 Series	•	•	•	•	•
Tecra 530 Series	•	•	•	•	•
Tecra 540 Series	•	•	•	•	•
Tecra 700 Series	•	•	•	•	•
Tecra 710 Series	•	•	•	•	•
Tecra 720 Series	•	•	•	•	•
Tecra 730 Series	•	•	•	•	•
Tecra 740 Series	•	•	•	•	•
Tecra 750 Series	•	•	•	•	•

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Direct Hire		
1 day	3 days	5 days
LCD Projectors SVGA 500 ANSI		
£125	£146.87	£275
LCD Projectors SVGA 650 ANSI		
£125	£146.87	£275
LCD Projectors XGA 1200 ANSI		
£175	£205.62	£350
LCD Projectors XGA 800 ANSI		
£175	£205.62	£350
PLASMA 42" SVGA		
£245	£287.81	£395
PLASMA 50" XGA		
£425	£499.37	£699
6ft Mobile Screen		
£50	£58.75	£125

## Projectors

InFocus		
LP225	£1499	£1761.32
350Lumens SVGA		
LP725	£3299	£3876.32
750Lumens SVGA		
LP735	£4399	£5168.82
650Lumens XGA		
LP1000	£7599	£8928.82
1000Lumens XGA		
LP740	£1499	£1761.32
650Lumens SXGA		
1yrs FREE Insurance on all INFOCUS Models.		
ASK		
ASK A4 Compact	£3125	£3671.87
ASK A6+	£3895	£4676.62
A10	£6249	£7342.57
A8	£3850	£4623.75
MITSUBISHI		
LVP-X100E	£2949	£3465.07
LVP-X200	£4299	£5051.32
NEC		
MT820 SVGA	£2949	£3465.07
MT1020 XGA	£3895	£4676.62
PROXIMAX		
DS1	£2795	£3284.12
DP5800	£2545	£2990.37
DP5900	£3299	£3876.32
DP9200	£3899	£4681.32
PHILIPS		
4100	£1999	£2348.82
4650 Endurance	£2695	£3166.62
4650 Impact	£2795	£3284.12
4750	£4595	£5399.13
SANYO		
PLC-5605 SVGA 700	£3195	£3754.12
PLC-8805 XGA	£3895	£4676.62
PLC-8815 XGA 600	£4395	£5164.12
PLC-9005 XGA 1600	£6595	£7749.12
SONY		
CPJ-D500	£1099	£1291.32
VPL-S600 SVGA 65	£3749	£4405.07
VPL-X600 XGA 600	£4449	£5227.57
ViewSonic		
PJ800	£2999	£3523.82
PJ802	£2849	£3347.57
PJ1000	£4299	£5051.32

## Video Conferencing

Connectix		
QuickCam VC USB	£73	£85.77
QuickCam VC	£73	£85.77
Software		
Digital Radar	£18	£21.15
PhotoBadge	£38	£44.65
Wig Out	£18	£21.15
CREATIVE		
WebCam II	£54	£63.45
intel		
Create & Share USB	£98	£115.15
Create & Share PCI	£138	£162.15
ProShare Video	£595	£699.12
ProShare Video System 200	£839	£985.82
Kodak		
DVC223 Desktop USB	£125	£146.87
pace		
Desktop Colour	£68	£79.90
Camera USB	£68	£79.90
VideoLogic		
Captivator PCI/VC	£145	£170.37



**InFocus** Presents The Smallest multi-media projector in the World.

## the AWARD WINNING LP425

Portability & Powerful Performance from **InFocus**  
 the World's Largest manufacturer of data/video projectors

**7 Day No Quibble Money-Back Guarantee.**

### InFocus LP425

£2999 ex vat £3523.82 inc vat



£275 ex vat £323.12 inc vat

## DLP LP425 Spec

A TEXAS INSTRUMENTS TECHNOLOGY

- 3.1Kg
- 700 ANSI Lumens
- SVGA (800 x 600)
- Plug & Project
- Full Video Compatibility
- Soft Carry Case
- 1 Years **FREE** Insurance
- 2 Year Warranty

### Personal Pack

Includes remote mouse  
**InFocus** cable wizard,  
 Dual carry case (Laptop & Projector).

## DVMS PERSONAL PROJECTOR GOES WHERE YOU GO... EASILY.

DLP DLX 650 DPB 1200

- Weight: Lightweight 9.9 pounds
- Brightness: 650 ANSI lumens
- Resolution: XGA
- Colour Palette: 16.7 million colours (24-bit)
- Display: Single-Chip DMD (Digital Mirror Device)
- Projection Lamp: 120-watt Metal Halide
- Lamp Life: 2000 hours
- Projection Lens: Motorized zoom 1.2:1.7 with 17-degree keystone adjusted image
- Image Configuration: Plug & Project auto image positioning, auto-tracking and auto synchronization
- Audio System: Built-in 10-watt loudspeaker
- Warranty: 2 Year, 24 hour swap out warranty
- Guarantee: 7 Day No Quibble Money Back
- TV Tuner: Includes built-in TV tuner



**DVMS DL450**  
 £2239 ex vat £2630.82 inc vat

**DVMS DLX650**  
 £3499 ex vat £4111.32 inc vat

**DVMS DPB1200**  
 £5250 ex vat £6168.75 inc vat

## HITACHI CP-S830 Multimedia LCD Projector



The CP-S830 is the only ultra compact projector that does not sacrifice the features necessary for use in wide-ranging presentation situations.

- True resolution 800 x 600 SVGA
- 500 ANSI Lumens
- Remote control with mouse function
- 150W Ultra high brightness
- 2000hr lamp life
- Genesis chip for image resizing
- 1:1.3 zoom lens
- Stereo Speakers

**HITACHI CPS 830**  
 £2125 ex vat  
 £2496.87 inc vat

**HITACHI CPL 850**  
 £2249 ex vat  
 £2642.57 inc vat

**HITACHI CPX 955**  
 £3775 ex vat  
 £4435.62 inc vat

### PROJECTORS FOR HIRE BY TECH DIRECT

	VGA	SVGA	XGA
Per day	£125 ex vat	£150 ex vat	£225 ex vat
	£146.87 inc vat	£176.25 inc vat	£264.37 inc vat
Per week	£375 ex vat	£450 ex vat	£675 ex vat
	£440.62 inc vat	£528.75 inc vat	£793.12 inc vat

## SHARP

XGA INTELLIGENT COMPRESSION



300" SVGA AMP & AUTO  
 762 cm 800 X 600 SPEAKER Table Top Ceiling VOLTAGE

### XG-NV33E

- 900 ANSI Lumens (targeted)
- True XGA (1024 x 768) resolution
- Weight 6.6kg

**SHARP XG-NV33E**  
 £3849 ex vat  
 £4522.57 inc vat

### XG-NV4E

- 600 ANSI Lumens Brightness
- True SVGA (800 x 600) Resolution
- Weight only 4.5kg

**SHARP XG-NV4E**  
 £2799 ex vat  
 £3288.82 inc vat

### XG-NV5E

- 600 ANSI Lumens (targeted)
- True XGA (1024 x 768) resolution
- Weight 4.5kg

**SHARP XG-NV5E**  
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SHARP VISION



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**EPSON**

**NEW EPSON EMP7300**

*NEW Projector Ultra Bright 1200 ANSI Lumens*

- Ultra Compact multimedia projector
- XGA 1024 x 768 Resolution
- Supports SXGA, SVGA and VGA
- Ultra bright 1200 ANSI Lumens
- Surround Sound audio capability
- Multiple Input Sources with Auto Recognition
- World Wide video format support
- Automatic setup, resizing and positioning
- Weighs only 6.2Kg
- Remote Control Operation from up to 10m



**EPSON EMP 7300**  
£6589 ex vat  
£7742.07 inc vat

**NEW EPSON EMP5500**

*Ultra portable, super slim, high bright, fully featured projector*

- True SVGA, supports VGA, XGA
- 650 ANSI Lumens
- Ultra portable 4.2kg
- High quality 0.9" Polysilicon LCD panel technology
- True SVGA resolution with Balanced Image size Conversion technology for high quality VGA & XGA display
- Optional portable screen for presentations in any environment



**EPSON EMP 5500**  
£3149 ex vat  
£3700.07 inc vat

**NEW EPSON EMP7200**

*Compact, Light & Ultra Bright*

- True XGA (1024 x 768) resolution
- Weighs only 6.2kg
- Super bright 1000 ANSI Lumens
- Advanced connectivity
- Auto Source recognition
- Rear & ceiling projection
- Stereo speakers



**EPSON EMP 7200**  
£4589 ex vat  
£5392.07 inc vat

**NEW EPSON EMP5100**

*Compact, Light & Ultra Bright*

- SVGA resolution with XGA & VGA support
- Weighs only 6.6kg
- 750 ANSI Lumens
- Multi-connectivity
- Stereo speakers
- Remote control



**EPSON EMP 5100**  
£3199 ex vat  
£3758.82 inc vat

**NEW EPSON EMP5300**

*Compact, Light & Ultra Bright*

- True SVGA resolution with Advanced Image Realtime Resizing technology for high quality VGA, XGA & SXGA display
- Weighs only 6.2kg
- Ultra bright 1200 ANSI Lumens
- Bundled with ELP Link III software
- Ultra High Aperture 1.3" Polysilicon LCD panels with Metal Sandwich Structure



**EPSON EMP 5300**  
£3889 ex vat  
£4569.57 inc vat

**CTX**



**CTX - Can now offer a comprehensive range of Projectors - for every budget and every application.**

Model	Weight	W	Resolution Lumens	Resolution	Lamp Type	Elevation & Keystone	Image Size Keystone	LoudSpeaker	Lamp Changer	PC & Mac Compatible	PAL/SECAM/NTSC/Composite Video, S-Video	UPS
EZ Pro500	4.2Kg	350	640x480	800x600	400watt halogen	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓
EZ Pro550	4.2Kg	350	800x600	800x600	400watt halogen	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓
EZ Pro 550M	4.3Kg	350	800x600	1024x768	250watt metal halide	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓
EZ Pro 585	5.4Kg	550	800x600	1024x768	400watt halogen	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓
EZ Pro 600	5.4Kg	450	1024x768	1280x1024	400watt halogen	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓
EZ Pro 680	5.4Kg	450	1024x768	1280x1024	400watt halogen	Elevation 20 Keystone 25	40-160"	3watts x 2	✓	✓	✓	✓

**EZPRO 550/NEW 585**



**CTX EZPRO 550**  
£1249 ex vat  
£1467.57 inc vat

**CTX EZPRO 585**  
£1695 ex vat  
£1991.62 inc vat

- 350 ANSI lumens
- Compact design for portability
- High power, low cost 400W EVD halogen lamp
- Less than half the weight of most LCD projectors
- Pop-up lens folds into projector for extra durability
- Will play from PC, MAC or video source

**EZPRO 500/600**



- 550 ANSI lumens
- 800 x 600 SVGA resolution
- 1024 x 768 XGA (compressed)
- 16.7 million colours
- Weight 12lbs

**CTX EZPRO 500**  
£975 ex vat  
£1145.62 inc vat

**CTX EZPRO 600**  
£2239 ex vat  
£2630.82 inc vat

**EZPRO 680**



**CTX EZPRO 680**  
£2669 ex vat  
£313.07 inc vat

- 450 ANSI Lumens target brightness
- 1024 x 768 resolution
- 1280 x 1024 SXGA (compressed)
- Remote Control mouse function
- 16.7 million colours
- SXGA/XGA/SVGA/VGA/ VESA Mac NEC PC - 98/ FM Towns compatible

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OXFORD INTERACTIVE ENCYCLOPEDIA  
LET'S START LEARNING  
THINK & TALK FRENCH  
KITCHEN GOURMET  
DESIGN CENTRE 3D  
TYPING TUTOR PRO

## SANYO

The brightest, most advanced, most versatile and most user friendly RANGE OF LCD PROJECTORS available.



- True XGA resolution of 1024 x 768
- 110W UHP lamp, life span 2000 hrs
- 600 ANSI lumens picture brightness
- Ultra Compact
- Weight 3.9Kg, only 11cm high
- PCMCIA slot

**SANYO PLC SV15B**  
£2995 ex vat  
£3519.12 inc vat



- SVGA resolution of 800 x 600
- New DRIT technology
- 700 ANSI lumens brightness
- 120W UHP lamp, life span 2000 hrs
- Infrared remote control
- 2x data & 2 x video inputs

**SANYO PLC 5605B**  
£3195 ex vat  
£3754.12 inc vat



- True XGA resolution of 1024 x 768
- 110W UHP lamp, life span 2000 hrs
- 600 ANSI lumens picture brightness
- Newly developed control pannel
- Image diagonal of up to 16.3m
- Max projection distance of 23m

**SANYO PLC 8815B**  
£4395 ex vat  
£5164.12 inc vat



- True XGA resolution of 1024 x 768
- SXGA Compatible thanks to DRI
- 1500 ANSI lumens brightness
- Complete Workstation Compatibility
- Image size up to 15m (diagonal)
- In-Built Keystone Correction (+/-10°)

**SANYO PLC 9005B**  
£6595 ex vat  
£7749.12 inc vat

## Panasonic



The high-performance Panasonic PTL 595. Now with a light output of 700 ANSI lumens the PT-L595 has to be one of the best value-for-money projectors.

- True SVGA resolution of 800 x 600
- 280W metal halogen lamp, life span 2000 hrs
- 700 ANSI lumens brightness
- Clever compression of XGA resolution images without loss of data
- Image diagonal of up to 7.6m
- Max projection distance of 16m
- Infrared mouse remote control

**Panasonic PT-L 595**  
£2595 ex vat  
£3049.12 inc vat

**Panasonic PT-L 795**  
£3700 ex vat  
£4347.50 inc vat

## Pioneer

**DRI (Digital Reflective Imaging) projector**

When the best image counts, you need the brilliance of the new DRI - XGA data projector from Pioneer.



- True XGA resolution of 1024 x 768
- 150W Novarc lamp, life span 2000 hrs
- 800 ANSI lumens brightness
- DRI (Digital Reflective Imaging)
- Image diagonal of up to 16.3m
- Max projection distance of 23m

**Pioneer RVD - XG10ED**  
£3595 ex vat  
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## A wide range of screens to accompany every need.

Mobile Screen 90 x 120cm	£275	£323.12
Mobile Screen 120 x 160cm	£325	£381.87
Mobile Screen 125 x 125cm	£275	£323.12
Mobile Screen 160 x 160cm	£375	£440.62
Mobile Screen 130 x 180cm	£399	£468.82
Fast Fold Screen 180 x 240cm	£399	£468.82
Fast Fold Screen 200 x 200cm	£399	£468.82
Fast Fold Screen 250 x 250cm	£475	£558.12
Fast Fold Screen 300 x 300cm	£549	£645.07
Fast Fold Screen 350 x 350cm	£599	£703.82



## Desktop video cameras.



**FlexCam Pro**  
The color camera for people, rooms and 3D objects. With PAL composite video and S-Video output signal.

**FlexCam Pro**  
£349 ex vat  
£410.07 inc vat



**FlexCam Scientific Pro**  
The CDD color camera with an 8mm C-Mount lens is especially suited to applications such as the magnification of objects for scientific and medical use.

**FlexCam Scientific Pro**  
£549 ex vat  
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**FlexCam Document Pro**  
High-quality camera especially designed for the presentation and scanning of documents. With iris for impressive picture quality even in poor light conditions.

**FlexCam Document Pro**  
£549 ex vat  
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## Pioneer

The Largest & Thinnest XGA 50" Plasma Display Panel



- 40" Full Colour Plasma Display
- 16.7 Million Colours
- 150:1 Contrast ratio
- 400 cd/m<sup>2</sup>
- Composite, RGB, VGA
- Hand-remote and RS-232 control
- 50" Full Colour Plasma Display
- 16.8 Million Colours (24 bit)
- 150:1 Contrast ratio
- 350 cd/m<sup>2</sup> without a filter
- NTSC Composite, RGB, XGA

**Pioneer PDR V50**  
£9495 ex vat  
£11156.62 inc vat

**Pioneer PDR V401E**  
£5095 ex vat  
£5986.62 inc vat



- 42" Plasma Display monitor
- Extra High Contrast Ratio of 400:1
- 16.7 Million Colours
- Totally flat screen for distortion free pictures
- Built-in RGB input for PC Connection
- Wide ranging input capability

**JVC GD-V425PZW**  
£5699 ex vat  
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## LCD Panels Medium LCD panels with reliable technology - the economical alternative.



**Medium LCD panel SVGA Professional**  
demonstrate your Win 95 files to your audience in full SVGA 800 x 600 pixel resolution.

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**ProScreen 4650**  
*Portable Multimedia Projector*

- 850 ANSI Lumens
- Philips LIMESCO™ (Line Memory Scan Converter) for full automatic MultiScan data input handling, VGA up to SXGA resolutions without information loss
- Philips UHP Lamp; 120W up to 4000 hour lamp life with "virtually" constant light output for a perfect picture quality
- Full PC control via ergonomic trackball IR Remote Control supports 360 degree control of projector
- Intuitive Graphic User Interface offering: Display and Audio controls, Colour point adjustment, 3 personal preference settings, front/rear screen projection (horizontal mirror function).
- Fully Plug and Play compatible (VESA standard DDC 1/2B)
- Line doubling technology for perfect video performance
- Built-in loudspeaker for multimedia presentations
- Immediate shut-off-and-go, no cooling down of the UHP lamp
- Total Assurance: Reliability, robust design, First choice 24Hr Global Swap service, Free technical support (freephone).

**ProScreen 4750**  
*Portable XGA Multimedia Projector*

- 750 ANSI Lumens
- Philips LIMESCO™ (Line Memory Scan Converter) for full automatic MultiScan data input handling, VGA (640 x 480) up to SXGA (1280 x 1024) resolutions without information loss
- Philips UHP Lamp; up to 4000 hour lamp life with "virtually" constant light output for a perfect picture quality
- Full PC control via ergonomic trackball IR Remote Control supports 360 degree control of projector notebook and PC
- Intuitive Graphic User Interface offering: Display and Audio controls, Colour point adjustment, 3 personal preference settings, front/rear screen projection (horizontal mirror function).
- Designed for both table and ceiling mount installation with pre-keystone corrections
- Fully Plug and Play compatible (VESA standard DDC 1/2B)
- Line doubling technology for perfect video performance
- Built-in loudspeaker for multimedia presentations
- Flippable image for rear projection and ceiling/wall mount applications
- Immediate shut-off-and-go, no cooling down of the UHP lamp
- Total Assurance: Reliability, robust design, First choice 24Hr Global Swap service, Free technical support (freephone).

**Hopper SV10**  
*Ultra Portable Projector*

- 600 ANSI Lumens
- Philips LIMESCO™ (Line Memory Scan Converter) for full automatic MultiScan data input handling, VGA up to SXGA resolutions without information loss
- Philips UHP Lamp; 120W up to 4000 hour lamp life with "virtually" constant light output for a perfect picture quality
- Quiet - a quarter of the noise of current projectors
- Manual zoom/focus
- Auto Voltage - automatic world wide compatibility
- Best performance - 600 ANSI Lumens, longest brightness over time, 85% picture homogeneity
- Built-in loudspeaker for multimedia presentations
- Total Assurance: Reliability, robust design, First choice 24Hr Global Swap service, Free technical support (freephone).

**£2545 ex vat**  
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£3871.62 inc vat



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**PROXIMA®**  
MULTIMEDIA PROJECTORS

**PRO AV DP9310**  
*Power, flexibility and control*

Now there's a better way to equip your boardroom, auditorium, training centre, meeting facility, or lecture hall with the latest multimedia display capability. It's Proxima's PRO AV DP9310. The 9310 delivers the brightness and resolution your users will appreciate, with the versatility and affordability to make you and your installation a brilliant success.

- 2100 ANSI Lumens makes it ideal for virtually any environment
- True XGA (1024 x 768) resolution with VGA (640 x 480) through SXGA (1280 x 1024) support provides compatibility with all popular workstations, PC's & Macs
- Motorized 1.6:1 zoom lens gives you a wide range of setup options
- A wide selection of optional lenses offers the utmost flexibility for installation in small and large venues
- Integrated video line doubling means exceptional video quality
- Configurable Input and output computer connectors let you customize your projector for seamless integration with your installed cabling
- Power lens shift system offers hassle free vertical image adjustment with automatic keystone correction
- Can be ceiling mounted, rear projection, or placed on a movable cart
- Can be stacked to double or triple the projected brightness for clear images in harsh lighting conditions



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*Good contrast and uniformity with excellent video performance. Represents a tremendous improvement over previous plasma displays.*

Eiki now offers an Improved presentation unit in their new 42" diagonal, Plasma display panel.

designed to be quieter operating, this latest distortion free thin screen, also boasts a brighter picture with whiter whites, blacker blacks and more sophisticated colour.

- 42" diagonal screen size
- 852 x 480 = 408,960 pixel resolution
- 16.7 million colours
- Up to 160°, horizontally and vertically
- Full function remote control
- Digital SVGA compression
- 2 Built-in speakers & 2 watt RMS audio amplifier
- Weight 87lbs. (39.5kg), 350watts power consumption



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## Cameras

<b>AGFA</b> ePhoto 307 ePhoto 780	£139 £245	£163.32 £287.87
<b>CASIO</b> QV-300 QV-100 QV-11 QV-700 QV-5000SX QV-7000SX DP8000	Call Call Call £229 £325 £329 £189	£269.07 £381.87 £386.57 £222.07
<b>EPSON</b> PhotoPC 600 PhotoPC 700 Accessories PhotoPC 600 AC Adaptor PhotoPC 600 4Mb Card PhotoPC 600 15Mb Card	£255 £299 £49 £99 £259	£299.62 £351.32 £57.57 £116.32 £304.32
<b>FUJIFILM</b> DIGITAL IMAGING DX-8 DX-9 MX-500 MX-700 DS 300	£148 £239 £299 £398 £1245	£173.90 £280.82 £351.32 £467.65 £1462.87
<b>HP</b> HEWLETT PACKARD PhotoSmart	£398	£467.65
<b>HITACHI</b> MPEG Video camera	£1425	£1674.37
<b>JVC</b> GC-S1 Still Camera GR-DVL 9000 Video	£299 £1347	£351.32 £1582.72
<b>Konica</b> Q-M100 Q-Mini Q-EZ	Call Call Call	
<b>LG</b> ArtShot LDC-F25P	Call	
<b>MINOLTA</b> Dimage V	£315	£370.12
<b>Nikon</b> CoolPix 100 CoolPix 300	£245 £328	£287.87 £385.40
<b>PENTAX</b> KX1600a NV-DCF2	£199 Call	£233.82
<b>Panasonic</b> EI-C90	Call	
<b>Polaroid</b> PDC-2000	Call	
<b>PRAKTIKA</b> PD-100	Call	
<b>Premier</b> DC600	Call	
<b>RICOH</b> RDC-2E RDC-4300	£499 £399	£586.32 £468.82
<b>SANYO</b> DigiCam 210 DigiCam 250 DigiCam 300 XGA VPC-X300 VPC-X350 Accessories 200 AC Adaptor 300 AC Adaptor	£198 £245 £315 £294 £375 £48 £49	£232.65 £287.87 £370.12 £345.45 £440.62 £56.40 £57.57
<b>SHARP</b> VE-LC1	Call	
<b>SONY</b> DSC-F1 DKC-ID1	£369 £489	£433.57 £574.57
<b>Vivitar</b> VviCam 2500 VviCam 3100	Call Call	
<b>YASHICA</b> KC600L	Call	

# Canon

Since 1982 Canon (UK) have grown to become a leading supplier of digital cameras, and now they have used their technical innovation to design a range of flatbed scanners which are ideal for use at home or in the office. With a number of high-end features and remarkably low prices these products offer excellent value for money.



## PowerShot A5

- Rechargeable NiMH battery
- Disposable 2CR5 Lithium battery
- Battery charger/mains adapter
- 8Mb CompactFlash card
- Connecting cables
- Adobe Photoshop Plug-in module

**Canon A5**  
£428.87 inc vat



## PowerShot 600

- Rechargeable NiCad battery
- Battery charger/mains adapter
- Sound recording facility with each image
- Connecting cables
- TWAIN driver

**PowerShot 600** £499 £586.33  
**PowerShot 350** £239 £280.82  
**PowerShot 30T** £199 £233.82



## CanoScan 320P

- 300 x 300 dpi Optical resolution
- Parallel port interface
- Will scan 1 sheet of full colour A4 in 60 secs
- 30 Bit colour scanning
- LIDE technology allows for more accurate scans & near silent scanning

**Canon CanoScan 320P**  
£82.23 inc vat



## CanoScan 620P

- 600 x 600 dpi Optical resolution
- Parallel port interface
- 30 Bit colour scanning
- LIDE technology allows for more accurate scans & near silent scanning

**Canon CanoScan 620P**  
£111.61 inc vat



**OLYMPUS C-1400XL SLR**  
• 1.4 Million Progressive CCD  
• 1280 x 1024 SXGA Resolution  
• 3x Optical zoom  
• Autofocus & Intelligent flash  
• 2" TFT High Res LCD Screen  
• Two 4Mb SmartMedia cards  
• Leather case, Charger Set, PhotoSnap

**OLYMPUS C-1400XL**  
£849 ex vat £997.57 inc vat



## C-900

- Smallest 3x Optical Zoom Camera
- 35-105 (equiv 35mm) Zoom lens
- 2x Digital Zoom up to 210mm
- 1.31 Million pixels for true Photo quality
- 1280 x 960 Megapixel resolution
- Panorama option on SmartMedia card for landscape shots

**OLYMPUS C-900**  
£549 ex vat £645.07 inc vat



## C-840L

- 1.3 million Pixels
- 1280 x 960 Resolution
- Digital 2x zoom
- 4Mb card stores 9/18/60+ images
- NEW D-RAM faster processing tech
- Close focusing to 10cm

**OLYMPUS C-840L**  
£49 ex vat £492.32 inc vat



## P330-E Dye Sub Printer

- Prints photos direct without a PC
- SmartMedia card input for cameras
- Video Input for Video/camcorder image capture
- Video output for connecting to TV
- Produces A6 prints at 1376 x 14024 res
- Also MAC/PC compatible

**OLYMPUS P330-E**  
£398.32 inc vat

# SONY

## Mavica Digital Still Cameras

There are two models to choose from, the Digital Mavica MVC-FD5 and the more advanced MVC-FD7. The MVC-FD7 has all the functions of the MVC-FD5, plus 10x optical zoom lens, manual focus, and five pre-programmed auto exposure modes.



- 2.5" TFT LCD display
- stores up to 20 high resolution or 40 standard resolution images on one 3.5" 2HD floppy
- 640 x 480 (VGS) image size

**SONY MVC-FD5**  
£325 ex vat £381.87 inc vat

**SONY MVC-FD7**  
£425 ex vat £499.37 inc vat

# Kodak

## The Award Winning DC210 Zoom camera



- True megapixel CCD with 1152 x 864 image resolution
- 4Mb picture card included stores 16 - 60 pictures
- 1.8" TFT colour LCD for picture preview & review
- 2X Focus Free Zoom Lens with close-up mode
- easy function select via Mode Dial
- Finished File Format (JPEG or FLASHPIX)
- Drag & Drop image straight into application
- serial (RS232C), Infrared (IrDA) & Video Out (NTSC & PAL) interfaces display pictures straight to TV!
- Supplied with Kodak PictureEasy 2.0 Adobe PhotoDeluxe & PageMill software, Windows '95 mounter & TWAIN Acquire module
- Optional Macintosh Interface Kit

**Kodak DC210**  
£375 ex vat £440.62 inc vat

**Kodak DC200**  
£215 ex vat £252.62 inc vat

**DC220** £345 £405.37  
**DC260** £619 £727.32  
**DVC323** £118 £135.12  
**FD 300** £245 £287.87

DC200 is as DC210 except: No carry case, No Adobe software, No infrared interface, No zoom lens

## MEMORY SOLUTIONS FOR DIGITAL CAMERAS.

### Compact Flash Cards

<b>8MB</b> £39 £45.82	<b>15MB</b> £69 £81.07
<b>30MB</b> £99 £116.32	<b>45MB</b> £149 £175.07

Compact Flash works with the following cameras:

- Canon PowerShot 350, A5
- Casio QV-700
- Epson PhotoPC 600, 700
- Kodak DC-120, 210, 220, 260
- Mustek VDC-200
- Nikon Coolpix 900 (8 & 15Mb only)
- Panasonic KXL-600A, 601A
- Samsung SSC-410N
- Umax Photolon



Add a PCMCIA adapter to convert Compact Flash to ATA Flash.

ATA Flash works with the following cameras:

- Agfa ActionCam
- Canon EOS-1, DCS1, DCS3, PowerShot 600
- Fuji DS-300, 505, 515, HC-2000
- Fuji DS 220
- Kodak DC-50, DCS420, 460, 465, EOS
- DCS1, DCS1, DCS5
- Minolta RD-175
- Nikon E2, E2N, E2S
- Pentax E1-C90
- Ricoh RDC-2, 2E
- Sony DKC-1D1

**Adapter**  
£9 £10.57

### External Parallel Port Memory Card Readers

**Compact Flash/ATA Flash** £79 £92.82  
**Smart Media/ATA Flash** £89 £104.57



### Smart Media cards

<b>4Mb</b> £21 £24.67	
<b>8Mb</b> £32 £37.60	
<b>16Mb</b> £55 £64.62	

Smart Media cards work with the following cameras:

- Agfa ePhoto 780, 1280
- Epson PhotoPC 550
- Fuji DX-5, 7, 9, MX-700
- Olympus C-420L, 820L, 840L, 1400L
- Ricoh RDC-300Z, RDC4300
- Sanyo VPC X300, DSC-X1
- Toshiba PDR-2A

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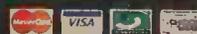
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# AGFA *Agfa*

**FREE technical support hotline: 0181 231 5511**

## NEW - SnapScan 1212P - NEW

This 600 x 1200 ppi EPP scanner offers exceptional value for money.



**AGFA** SnapScan 1212P  
**£78.99 ex vat**  
 £92.81 inc vat

- High Optical resolution of 600 x 1200 ppi with enhancement to 9600 x 9600 ppi
- Impressive internal 36-bit colour depth
- High reliability and tested compatibility with other EPP devices
- Built-in Agfa colour management system compatible with Win 95, Win 98 and Win NT
- Software inc: Agfa FotoSnap, Agfa FotoLook, Photo Express, OmniPage Limited Edition and Visioneer PaperPort
- Market-leading service and support

## NEW - SNAPSCAN 1212U - NEW

A high-quality A4 scanner that is designed specifically for PC's equipped with a Universal Serial Bus (USB).



**AGFA** SnapScan 1212U  
**£94.99 ex vat**  
 £111.61 inc vat

- High Optical resolution of 600 x 1200 ppi with enhancement to 9600 x 9600 ppi
- Outstanding internal 36-bit colour depth
- The USB interface transfers 1Mb per sec
- Built-in Agfa colour management system
- Compatible with Windows 98 and the latest USB technology
- Software inc: Agfa FotoSnap, Agfa FotoLook, Photo Express, OmniPage Limited Edition and Visioneer PaperPort
- Market-leading service and support

## NEW - ePhoto 780 - NEW

**PhotoGenie™ technology for resolution up to 1204x768 pixels.**

- 4 image quality options for resolutions up to 1024 x 768 with Agfa PhotoGenie
- Virtually no waiting between pictures
- Record, playback or delete images using the 1.8" LCD screen
- Store up to 96 photos on each removable memory card (1 2MB SmartMedia card inc)
- View pictures on TV (NTSC/PAL cable inc)
- Use pictures right away with Agfa PhotoWise
- The ePhoto 780 includes everything you need - camera, cables (PC, MAC, TV), software, removable memory, batteries, and wrist strap.



**AGFA** ePhoto 780  
**£189 ex vat**  
 £222.07 inc vat

## NEW - SNAPSCAN 1236S - NEW

Top of the range, high-performance A4 scanner for both home and office use.

- SCSI-port connection for maximum scanning speed and cross-platform use
- High Optical resolution of 600 x 1200 ppi with enhancement to 9600 x 9600 ppi
- Outstanding internal 36-bit colour depth - ideal for transparency scanning
- Built-in Agfa colour management system
- PC scanner controls supports Windows 95, Win 98 and Win NT
- Software Inc: Agfa FotoSnap, Agfa FotoLook, Photo Express, Caere OmniPage LE (PC only), Visioneer PaperPort inc OmniPage Lite.



**AGFA** SnapScan 1236S  
**£123.95 ex vat**  
 £145.64 inc vat

**AGFA** 1236S Artline  
**£157.95 ex vat**  
 £185.59 inc vat

ePhoto 1680	£455	£534.62	SnapScan 600 Artline	£199	£233.82
ePhoto 1280	£347.95	£408.84	T1200	£429	£504.07
Arcus II Solo	£575	£675.62	T2500	£2899	£3406.32
SnapScan 310P	£88.99	£81.06	DuoScan solo	£1439	£1690.82



# UMAX

## The Award Winning UMAX scanners



### ASTRA 1220S FLATBED SCANNERS

Umax continues its run of PC Pro awards with the Astra 1220S. With a high 600x1200 optical resolution the Astra delivers the best quality scans of any of the devices on test. Detail was sharp, colour accurate and contrast realistic. Using a 30-bit sample, the Astra achieves a better tonal range than scanners with 24-bit processes.

At £125, the Umax is reasonably priced and is one of the better value scanners on test. But no corners have been cut in build quality, with solid, stylish chassis sporting extendable lid hinges which rise when a thick magazine or book is being scanned. You can also remove the lid for scanning very large objects.

In all, the Umax Astra 1220S is an amazing quality scanner at a very reasonable price, making it a worthy Quality winner.



**NEW 1220S 36-Bit Model ONLY £125 + vat**

- 1220S SCSI scanner
- 600 x 1200 dpi optical resolution
- New 1220S 36-Bit model
- Free Umax VistaScan software
- Easy-to-fit user friendly model
- Adobe Photoshop LE **£30 + vat**

**PC QUALITY. SPEED. PRO VALUE FOR MONEY. OVERALL.**

**UMAX** Astra 1220S  
**£125 ex vat**  
 £146.87 inc vat

Astra 1220S Flatbed Scanner With Transparency Adapter	Call	Call
2nd year extended warranty for ASTRAS	£29.95	£35.25
Powerlook ColourStudio 2LE	£729	£856.57
Powerlook III	£1965	£2308.87
Mirage II Pro	£4995	£5869.12

(Powerlook II & III Inc. MetaCreations Painter 5 OEM version & Wacom Artpad II **FREE** while stocks last)

### ASTRA 610S AND 610P INCLUDE ADOBE PHOTO DELUXE SOFTWARE - FREE!!

#### ASTRA 610S SCSI

The Astra 610 flatbed scanner offers exceptional value for those who are looking for an easy and low cost introduction to scanning. Offering 4,800 dots per inch resolution (300 x 600 dpi optical resolution) and over one billion colours (30 bit colour depth).

- Single pass colour scanner
- 30-bit, over one billion colours
- 600 x 300 dpi optical resolution
- Easy-to-fit user friendly model
- Presto file management software inc.

**UMAX** 610S SCSI  
**£79 ex vat**  
 £92.82 inc vat



#### ASTRA 610P PARALLEL

- Single pass colour scanner
- 30-bit, over one billion colours
- 600 x 300 dpi optical resolution
- Easy-to-fit user friendly model
- Presto file management software inc.

**UMAX** Astra 610P  
**£59 ex vat**  
 £69.33 inc vat

### ASTRA 1220P/1220U FLATBED SCANNER

Amazing low price 30 bit scanner

- 1200P Parallel scanner
- 600 x 600 dpi optical resolution
- New 30-Bit model
- Free Umax VistaScan software
- Easy-to-fit user friendly model
- Adobe Photoshop LE **£30 + vat**

**UMAX** Astra 1220P  
**£84 ex vat**  
 £98.70 inc vat



**UMAX** Astra 1220U  
**£99 ex vat**  
 £116.32 inc vat

Scanners			
EPSON	ex vat	inc vat	
GTx-5500 Wins	£125	£146.87	
GTx-5500 SCSI	£125	£146.87	
GTx-9500 Parallel	£365	£428.87	
GTx-9500 SCSI	£324	£380.70	
GTi-9500 Parallel	£537	£630.97	
FilmScan 200 SCSI	£189	£222.07	
<b>Accessories</b>			
GT Automatic Document Feeder	£308	£361.90	
Transparency Unit	£358	£420.65	
<b>HEWLETT PACKARD</b>			
ScanJet 5s Parallel	£129	£151.57	
ScanJet 5100C	£144	£169.20	
ScanJet 6200C	£237	£278.47	
ScanJet 5 Ethernet	£1604	£1884.70	
<b>Accessories</b>			
6100 Automatic Document feeder	£258	£303.15	
6100 Transparency Unit	£368	£432.40	
<b>Logitech</b>			
ScanMan Colour 2000	£42	£49.35	
PageScan Parallel	£84	£98.70	
FreeScan Parallel	£98	£115.15	
<b>MICROTEK</b>			
Phantom 330 Parallel	£69	£81.07	
Phantom 636 Parallel	£89	£104.57	
Phantom 336CX P	£59	£69.32	
ScanMaker 330 SCSI	£75	£88.12	
ScanMaker 366 SCSI	£95	£111.62	
ScanMaker 636 SCSI	£179	£210.32	
ScanMaker X6 SCSI	£139	£163.32	
35T Plus SCSI	£595	£699.12	
ScanMaker 4 SCSI	£525	£616.87	
ScanMaker 5 SCSI	£1499	£1761.32	
ScanMaker 6400XL A3 SCSI	£399	£476.32	
ScanMaker 9600XL A3 SCSI	£1499	£1761.32	
<b>Accessories</b>			
330630 Transparency Unit	£75	£88.12	
<b>Polaroid</b>			
SprintScan 35LE S	£418	£491.15	
SprintScan Plus S	£1189	£1397.07	
<b>visioneer</b>			
PaperPort 3000	£67	£78.72	
PaperPort Strobe Colour	£129	£151.57	
PaperPort 6000	£89	£104.57	

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WITCHAVEN  
ENEMIES FROM SPACE  
TRUMP CASTLE  
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FAMILY PACK



BODYWORKS 6.0  
OXFORD INTERACTIVE ENCYCLOPEDIA  
LET'S START LEARNING  
THINK & TALK FRENCH  
KITCHEN GOURMET  
DESIGN CENTRE 3D  
TYPING TUTOR PRO

## Nikon COOLSCAN III

The Personal Film Scanner With Revolutionary New Technology!!

- Digital ICE - automatically removes surface imperfections such as dust & scratches from scans.
- Resolution - high optical resolution of 2700dpi - 30-bit colour depth - shows detail even in the shadow & highlight areas of the image.
- Colour Matching Library - provides vivid & extremely accurate colour matching on both monitors & printers.
- Versatile film loading - 35mm strip film & slide mount adapter
- Advanced Photo System - optional adapter for scanning APS
- Hot swap adapters for simple switching between film types

NEW!! LS2000 SuperCoolScan (with Nikon Scan)	£989	£1162.07
NEW!! LS2000 SuperCoolScan (with SilverFast, Nikon Scan + PhotoShop LE)	£1099	£1291.32
NEW!! CoolPix 600 Digital camera Standard	£355	£417.12
NEW!! CoolPix 600 Digital camera Premier	£389	£457.07
NEW!! CoolPix 900 Digital camera Standard	£679	£800.32
NEW!! CoolPix 900 Digital camera Premier	£635	£746.12
NEW!! LS1000 SuperCoolScan	£995	£1169.12
NEW!! CoolScan III with Nikon Scan 2.1	£499	£586.32
CoolScan III with Nikon Scan 2.1 (with Adapter 1535 SCSI Card)	£515	£605.12
CoolScan II Ext (with SilverFast)	£549	£645.07
CoolScan II Int (with SilverFast)	£469	£551.07



### PhotoPC 700

Megapixel (1280 x 960) Auto Focus Digital Camera



- Megapixel (1280 x 960) Auto Focus Digital Camera
- Large, high quality, built-in 2" LCD colour view finder
- PAL TV & Video output for large screen viewing
- Extensive range of software included
- Up to 10 exposure continuous-shot mode
- Direct Printing to the Epson Stylus Photo range
- Amazing close-up 10cm macro facility

EPSON PhotoPC 700  
£299 ex vat £351.32 inc vat

### GT 7000 Scanner

High quality 9600 dpi scanner

- Affordable, compact colour flatbed scanner
- High Quality 600 x 2400 dpi optical resolution with EPSON Micro Step Drive
- Can distinguish 68 billion different colours (36 bit)
- Start button for easy one touch scanning
- Ultra fast scanning - a leader in it's class



EPSON GT 7000  
£145 ex vat £170.37 inc vat

## FANTASTIC NEW MODEL!! Just LOOK at these prices!!

### Genius COLORPAGE VIVID PRO II



- 36 bit single pass flatbed scanner
- Easy set up - plugs right into your printer port
- 600 x 1200 dpi optical resolution
- 9600 dpi interpolated resolution
- Powerful image editing software iPhotoExpress & PhotoImpact SE
- Recognita OCR software
- TWAIN support for Win 95/98/NT

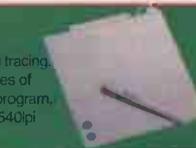
ONLY £49 + vat

30 BIT ColorPage View Flatbed Scanner £39 £45 inc vat  
30 BIT SCSI ColorPage HR5 Flatbed Scanner £99 £116 inc vat

### WizardPad

Pressure sensitive tablet with cordless stylus

Wizard pad is the natural tool for drawing, painting, sketching and tracing. With the 256-level pressure sensitive pen, you can achieve all types of shapes and thicknesses. Bundled with the powerful Dabblor 2.0 program, you can become the artist you have always wanted to be. Up to 2540dpi



Genius WizardPad  
£49 ex vat £57.57 inc vat

### NetMouse PRO

Scrolling Mouse

Use magic button for scrolling windows. PRO PS/2 with a serial adapter included. Side button supports Office 97/ Internet Explorer 3.0 with one-step zoom and auto-planning and auto-scrolling functions in eight directions.



Genius NetMouse PRO  
£9 ex vat £10.57 inc vat

## hp HEWLETT PACKARD

Expanding Possibilities

### HP C20 Digital camera



- 1 megapixel (1152 x 872) resolution & 24 bit colour
- Supplied with AC adapter & 4Mb compact Flash card (stores up to 40 images) as standard
- Colour 1.8in LCD preview/postview display
- Offers very fast download to a PC or TV

HP Scanjet 3200 £63 £74.02  
HP Scanjet 4200 £117 £137.47  
HP Scanjet 5200 £156 £183.30  
HP Scanjet 6200 £237 £278.47  
PhotoScanner £318 £373.65

### HP Scanjet 4100c

- Flatbed, colour and monochrome scanner
- Enhanced scan resolution 1200dpi
- 600dpi Hardware Super Sampling
- 36-bit processing
- Automatic image & text optimisation
- Scan only once for text & image data acquisition
- USB connection for improved connectivity



HP HEWLETT PACKARD 4100c  
£116 ex vat £136.30 inc vat

### HP Scanjet 6250c

- Scans B/W line art for editing or enlargement with no loss of quality (Vectorization)
- Includes Auto document feeder as standard
- Enhanced scan resolution 1200dpi
- 1200dpi Hardware Super Sampling
- 36-bit processing
- USB & SCSI Interfaces for Max compatibility



HP HEWLETT PACKARD 6250c  
£277 ex vat £325.47 inc vat

## Kodak Advantix Film Drive FD300

Anyone using the latest APS cameras can now get the best of both worlds - prints and digital images. The FD300 scanner can turn your developed Advantix films into digital images in seconds. Its so simple and you don't even have to touch the negatives and risk fingerprints.

### Safe Keeping

Keep valuable pictures safe, stored on Advanced Photo System cassettes.

### Fast Access

Its easy to input pictures without scanning prints. Images load quickly, for use in letters, cards, email and so much more.

### No Fussing with Cables

Parallel interface cable with pass-through port lets you access your Film Drive FD300 and printer without swapping cables

### Includes Adobe PhotoDeluxe

Crop, zoom and recompose pictures. Add text, special effects, change backgrounds, eliminate red eye, sharpen and more. Create personalized calendars, cards, labels, flyers etc.



Kodak FD 300  
£245 ex vat  
£287.87 inc vat

## 9600 PRO 36 FLATBED SCANNER

TAMARACK



- Single pass, A4 size
- 600 dpi - 36 bit true colour 3D
- Parallel port EPP mode
- TWAIN driver for Win 3.1, 95/98 & NT
- Image editing software included: DocuMan 2.06, ArcSoft, (PStudio, PFantasy, PPrinter, MM E-mail)

9600 Pro 36  
£49 ex vat  
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### Now You See It.

## Rage Fury

- 32Mb of memory for realistic gameplay with massive textures & high resolution
- Explosive 128-bit 3D gaming action
- A new 128-bit graphics engine and 128-bit memory interface for incredibly fast 3D & 2D graphics performance
- Full OpenGL ICD, Direct 3D & DirectX 6.0 support for all your favourite applications & games
- Built-in hardware DVD for full-frame, full-screen DVD playback

OEM products inc. Graphics card, driver CD & manual only.

**£129 ex vat**  
£151.57 inc vat

## Rage Magnum

- A new 128-bit graphics engine and 128-bit memory interface for incredibly fast 3D & 2D graphics performance
- Explosive 128-bit 3D gaming action
- 32Mb of memory for realistic gameplay with massive textures & high resolution
- Full OpenGL ICD, Direct 3D & DirectX 6.0 support for all your favourite applications & games
- Built-in hardware DVD for full-frame, full-screen DVD playback

OEM products inc. Graphics card, driver CD & manual only.

**£119 ex vat**  
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3Dxpert98 AGP	£49	£57.57	£48	£56.40
3Dxpert@Work	£59	£69.32	£44	£51.70
3Dxpert@Work 8mb	£72	£84.60	£48	£56.40
3Dxpert@Work 4mb	£35	£41.12	£105	£123.37
3Dxpert@Work 8mb	£44	£51.70	£109	£128.07
3Dxpert@Work AGP 4mb	£35	£41.12	£64	£75.20
3Dxpert@Work AGP 8mb	£44	£51.70	£68	£79.90
3Dxpert@Play 4mb retail	£69	£81.07	£64	£75.20
3Dxpert@Play 8mb retail	£80	£94.00	£68	£79.90
3Dxpert@Play 4mb	£44	£51.70	£15	£17.62

### Hauppauge!

#### WinTV·Primio

Watch TV on your PC

Grab still and motion video images

Videoconference over the internet

Receive, print, copy and save professional Teletext data

**£80 ex vat** £58.75 inc vat

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Watch TV on your PC

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#### WinTV·Camera Bundle

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with high quality Nicam stereo audio

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Videoconference over the internet

color camera included in bundle

Receive, print, copy and save professional Teletext data

**£127.65 ex vat** £149.99 inc vat

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

## matrox

### MILLENNIUM G200

Superior acceleration for professional 2D/3D graphics

High performance Video card with full AGP 2X support 8Mb graphics memory upgradeable to 16Mb Advanced 2D, 3D and software DVD Video acceleration NEW MGA-G200 1280-Bit DualBus graphics High quality 3D rendering engine High speed 250MHz RAMDAC

OEM products inc. Graphics card & driver CD only.

**£64 ex vat**  
£75.20 inc vat

### MATROX G200

The Complete Windows, 3D and Video Accelerator

High performance Video card with full AGP 2X support 8Mb graphics memory Advanced 2D, 3D and software DVD Video acceleration NEW MGA-G200 1280-Bit DualBus graphics High quality 3D rendering engine High speed 230MHz RAMDAC

OEM products inc. Graphics card & driver CD only.

**£59 ex vat**  
£69.32 inc vat

8Mb AGP OEM	£64	£75.20	8Mb Productiva G100 AGP	£42	£49.35
8Mb AGP OEM	£75	£88.12	4Mb Mystique 220 OEM	£39	£45.82
8Mb Millennium G200 AGP OEM	£64	£75.20	4Mb Mystique 220 Business	£45	£52.87
8Mb Millennium G200 AGP retail	£75	£88.12	Rainbow Runner TV	£64	£75.20
8Mb Productiva G100 AGP OEM	£34	£39.95	Rainbow Runner Studio	£99	£116.32

## MODULAR technology

### TV Tuner

- 181 Channel Cable ready
- Closed Caption
- Auto Scan Tuning of Broadcast Channels
- Resizable TV Window and full screen viewing
- Source selection: TV antenna or Composite video (under software control)
- PC Interface: PCI 2.01 bus master
- Image resolution: Up to 768 x 576
- Audio: 3.5mm jack socket for external connection loud speakers or separate amplifier
- Video Capture: Capture to disk supported for single frames and AVI's
- Video Input: Supplied with composite video-in for connection to camcorders and VCR's
- Teletext: capture and display of Teletext pages, inc fastext and TopMenu. Teletext data can be copied to clipboard. DDE is also supported for links between Teletext page data and other Windows applications

**£50 ex vat**  
£58.75 inc vat

## DIAMOND

### Monster Fusion

The first Monster board with 2D and 3D acceleration melted together. No further graphics boards required. Supports games with the Microsoft DirectX™ API and 3Dfx Glide™ API. Available with up to 16 MB SDRAM, PCI or AGP.

**£99 ex vat** £116.32 inc vat

### VIPER 128

- Next generation nVIDIA TNT technology
- Full Screen DVD & MPEGII (AGP only)
- 16MB SDRAM, 250MHz RAMDAC
- Full OpenGL and DirectX3D support

OEM products inc. Graphics card & driver CD only.

**£79 ex vat** £92.82 inc vat

Stealth II G460 AGP	£41	£48.17	Monster 3D II Games 8mb	£95	£111.62
Fire 1000 AGP	£85	£99.87	Monster 3D II Games 12mb	£84	£98.70
Monster 3D	£48	£57.57	Monster 3D II Sport 8mb	£79	£92.82
Speed Star 3D	£29	£34.07	Monster 3D II Sport 12mb	£95	£111.62
Stealth II S220 PCI	£37	£43.47	Viper 550 PCI TV out	£99	£116.32
Fireport 40 PCI Ultra	£49	£57.57	Viper 550 AGP	£89	£104.57
Fireport 40 Dual	£85	£99.87	Viper 550 AGP TV out	£99	£116.32

## ASUS

### AGP-V3400TNT

- nVIDIA RIVA TNT chipset
- 8Mb of 125MHz SDRAM
- Full OpenGL support
- Complete with drivers for Win 95/98/NT
- TV out connector

**£99 ex vat** £116.32 inc vat

### AGP-V2740 (Intel i740)

**£45** £52.87

### AGP-V3000 (nVIDIA RIVA 128)

**£39** £45.82

### AGP-V5200 (3DLabs Dual Gint MX)

**£119** £139.82

### Riva TNT 16Mb AGP / PCI

**£79 ex vat** (£92.82 inc vat)

### 3D Blaster Banshee

**£79 ex vat** (£79.90 inc vat)

### Voodoo II 12Mb (inc. games)

**£79 ex vat** (£81.07 inc vat)

### Monitors

CTX	ex vat	inc vat
1451ELR 14"	£79	£92.82
1555ELR 15"	£95	£111.62
1569SE 15"	£104	£122.20
1769SE 17"	£164	£192.70
1792SE 17"	£229	£269.07
1795SL 17"	£259	£304.32
VL950T 19"	£329	£386.57
2085E 20"	£499	£586.32
2195E 21"	£689	£809.57
1569MS 15"	£139	£163.32
1769MS 17"	£229	£269.07
1569UA 15"	£149	£175.07
1792UA 17"	£299	£351.32
1785XE 17"	£199	£233.82
2185XE 21"	£625	£734.37
1995UE 19"	£339	£398.32
PV540 10.4"	£449	£527.57
PV600 12.1"	£569	£668.57

Formac UK	ex vat	inc vat
ProNitron 17" FST	£154	£180.95
ProNitron 17" TT	£239	£280.82
ProNitron 19" TT	£415	£487.62
ProNitron 20" TT	£609	£715.57
ProNitron 21" TT	£679	£797.82
ProNitron 24" TT	£1025	£1204.37

NEC	ex vat	inc vat
Multisync A500 15"	£149	£175.07
Multisync E500 15"	£179	£210.32
Multisync M500 15"	£199	£233.82
Multisync A700 17"	£275	£323.12
Multisync E700 17"	£359	£421.82
Multisync M700 17"	£379	£445.32
Multisync P750 17"	£365	£428.87
Multisync E1100 21"	£715	£840.12

NOKIA	ex vat	inc vat
449Xi Plus 15"	£169	£198.57
449Xa Plus 15"	£179	£210.32
447za 17"	£269	£316.08
447X Pro 17"	£349	£410.08
447X Pro A 17"	£319	£374.82
446X Pro 19"	£449	£527.58
445Xi Plus 21"	£679	£797.82
445X Pro 21"	£669	£786.07

Panasonic	ex vat	inc vat
SM50 15"	£155	£182.12
E70 17"	£205	£240.87
SL 70 17"	£262	£307.85
SL 90 19"	£439	£515.82
Pro S110 21"	£679	£797.82

SAMSUNG	ex vat	inc vat
SM400B 14"	£72	£84.60
SM500S 15"	£95	£111.62
SM500B 15"	£119	£139.82
SM700S 17"	£169	£198.57
SM700P 17"	£259	£304.32
SM1000P 21"	£649	£762.57

TAXAN	ex vat	inc vat
Ergovision 4300R 14"	£109	£128.07
Ergovision 550 15"	£129	£151.57
Ergovision 550S 15"	£139	£163.32
Ergovision 730 17"	£245	£287.87
Ergovision 730S 17"	£255	£299.62
Ergovision 740 17"	£295	£346.62
Ergovision 740S 17"	£295	£351.32
Ergovision 760 17"	£249	£292.57
Ergovision 760S 17"	£259	£304.32
Ergovision 975 19"	£435	£511.12
Ergovision 2150 21"	£745	£875.37

ViewSonic	ex vat	inc vat
E641 14"	£84	£98.78
E655 15"	£105	£123.37
G653 15"	£114	£133.95
P655 15"	£124	£145.70
E771 17"	£164	£192.70
GS771 17"	£205	£240.87
GA771 17"	£249	£292.57
GT771 17"	£209	£245.57
GT775 17"	£289	£339.57
G790 19"	£389	£457.07
PT775 17"	£289	£339.57
PT775 17"	£339	£398.32
P810 21"	£649	£762.57
PT813 21"	£649	£762.57
P815 21"	£715	£840.12
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### Video Cards

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Dynamic 3DGL 8Mb	£95	£111.62
Stragray II 12Mb	Call	

NUMBER NINE	ex vat	inc vat
Revolution 3D 4Mb	Call	
Revolution 3D 8Mb	Call	

STB	ex vat	inc vat
Nitro 3D OEM 2Mb	£31	£36.42
Nitro 3D OEM 4Mb	£49	£57.57
Velocity 128 4Mb	£84	£98.70
BlackMagic 3D		
Voodoo 2 12Mb	£155	£182.12
Nitro DVD 4Mb	£74	£86.95

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WinTV PCI	£65	£76.37
WinTV Radio PCI	£75	£88.12
WinTV Cinema Pro	£189	£222.07
WinTV Cinema Pro MPEG UG	£74	£86.95
WinTV Video Output Module	£89	£104.57
Video Wizard 60	£115	£135.12
	£295	£346.82

**miro**

MiroMEDIA PCTV PCI	£45	£52.87
Video Director Studio 200	£155	£182.12
miroVIDEO DC10	£169	£198.57
miroVIDEO DC30	£379	£445.32
miroVIDEO DV300	£489	£574.57
miroVIDEO DC30 Plus	£489	£574.57

**MODULAR**

QuantSight Kit	£49	£57.57
PC TV Tuner Int.	£45	£52.87
Voodoo 3D	£49	£57.57

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**CREATIVE**

CSW-20 20W	£9.95	£11.69
CSW-50 50W	£23	£27.02
CSW-100 100W	£35	£41.12
PC Works	£35	£41.12
CSW-200 200W	£65	£76.37
Sound Works	£65	£76.37
CSW-350 350W	£105	£123.37
Micro Works	£105	£123.37

**Genius**

SP-306 6WRMS	£14.50	£17.03
72W PMPO		
SP-710 10WRMS	£19.50	£22.91
120W PMPO		
SP-715 16WRMS	£27.50	£32.31
200W PMPO		
SP-718 36WRMS	£39	£45.82
320W PMPO		
10W Subwoofer		
3W+3WRMS 280W	£49	£57.57
PMPO		

**Labtec**

LCS-1016 4W	£19	£22.32
LCS-1030 10W	£29	£34.07
LCS-1040 10W 3D	£49	£57.57
LCS-2420 20W 3D	£49	£57.57
LCS-2632 32W 3D	£79	£92.82
APX 4620 70W 3D	£99	£116.32

**LE**

50w mains powered	£7	£8.22
80w mains powered	£10	£11.75
200w mains powered	£15	£17.62
300w mains powered	£25	£29.37
500w mains powered & Subwoofer	£40	£47.00

**Logik**

Maxim 30 30W	£9	£10.57
Maxim 60 60W	£20	£23.50
Maxim 120 120W	£30	£35.25
Headphone & Microphone	£6	£7.05

**PHILIPS**

DDS-350 350W	£89	£104.57
Digital USB 3D		
DSS-370 720W	£115	£135.12
Digital USB 3D		

**YAMAHA**

YST-M15 10W	£39	£46.82
YST-M20DSP 10W	£45	£52.87
YST-M25DSP 10W	£55	£64.62
+ 15W Subwoofer		
YST-MSW10 25W	£69	£81.07

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### LG Monitors

<b>500LC</b> 15.1" (15.1" viewable) screen 17" TFT Display Integrated SVGA VGA viewing angle, 80 left and 80 right, 60 top and 60 bottom, up to 1280 x 1024 @ 60Hz 128mm Dot Pitch Digital on-screen menu display £675 ex vat £793.12 inc vat	<b>SW77TS</b> 17" (15.8" viewable) screen Ultra contrast tube for greater levels of contrast & colour purity Flicker-free up to 1024 x 768Hz Non-Interlaced @ 60Hz 128mm Dot Pitch Digital on-screen menu display £475 ex vat £205.62 inc vat
<b>SW216SC</b> 21" (20" viewable) screen 17" TFT Display Integrated SVGA VGA viewing angle, 80 left and 80 right, 60 top and 60 bottom, up to 1280 x 1024 @ 60Hz 128mm Dot Pitch Digital on-screen menu display £589 ex vat £692.07 inc vat	<b>SW77M</b> 17" (15.7" viewable) screen Integrated SVGA VGA viewing angle, 80 left and 80 right, 60 top and 60 bottom, up to 1280 x 1024 @ 60Hz 128mm Dot Pitch Digital on-screen menu display £219 ex vat £257.32 inc vat
<b>SW78FT</b> 17" (16" viewable) screen 17" TFT Display Integrated SVGA VGA viewing angle, 80 left and 80 right, 60 top and 60 bottom, up to 1280 x 1024 @ 60Hz 128mm Dot Pitch Digital on-screen menu display £194 ex vat £110.45 inc vat	<b>SW571</b> 15" (13.8" viewable) screen Ultra contrast tube for greater levels of contrast & colour purity Flicker-free up to 1024 x 768 Hz Non-Interlaced @ 60Hz 128mm Dot Pitch Digital on-screen menu display £94 ex vat £110.45 inc vat

Call for prices

### SONY TRINITRON MONITORS

<b>SONY 300sf</b> £699 ex vat £821.32 inc vat	<b>SONY GDM-F500</b> £1244 ex vat £1461.70 inc vat
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**SONY TRINITRON MONITORS**

CPD-100es	£139	£163.32	CPD-220as	£319	£374.82
CPD-100gst	£189	£222.07	CPD-400pst	£469	£551.07
CPD-120as	£229	£269.07	CPD-300sf	£699	£821.32
CPD-200est	£259	£304.32	CPD-500pst	£739	£868.32
CPD-200gst	£285	£334.87	SON 20SE	£679	£797.82
CPD-200pst	£369	£433.57	520gst 21"	£695	£816.62

- 20" Trinitron Monitor
- 0.30mm Grille Pitch
- View: 388 x 292mm
- Max res. 1280 x 1024
- On-Screen Display
- Plug & Play for Win95
- TCO 95 compliance

- 21" Trinitron Monitor
- 0.22mm Slot Pitch
- View: 388 x 291mm
- Max res. 1800 x 1440
- On-Screen Display
- Inc: USB connectivity
- TCO 95 compliance

### The Nokia Advantage

<b>447Za</b> £269 (£316.08) • 17" High Contrast 0.27mm FST • Up to 1024 x 768 @ 90Hz • Built-in 5 watt stereo speakers • Built-in Hi-directional microphone	<b>447XS</b> £299 (£351.32) • 17" High Contrast 0.25mm FST • New Shortneck Technology • Up to 1280 x 1024 @ 60 Hz	<b>447Xpro</b> £349 (£410.08) • 17" Trinitron 0.25mm crt • On-Screen Menu with Navi™ key • Up to 1600 x 1200 @ 76 Hz
<b>446XS</b> £419 (£492.33) • 19" High Contrast 0.25mm FST • New Shortneck Technology • Up to 1600 x 1200 @ 75 Hz	<b>446XPro</b> £449 (£527.58) • 19" High Contrast 0.26mm FST • Up to 1600 x 1200 @ 85 Hz • On-Screen Menu with Navi™ key	<b>445Xi Plus</b> £679 (£797.83) • 21" High Contrast 0.28mm FST • Up to 1600 x 1200 @ 88 Hz • On-Screen Menu with Navi™ key

PC Advisor Recommended

**NOKIA** www.nokia.com

### MITSUBISHI COLOUR DISPLAY MONITOR

**Diamond Pro 900**

- 19" Colour monitor
- Features Mitsubishi's 100% Flat Diamond Tron CRT technology
- 0.25mm grille pitch
- 1600 x 1280 @ 75Hz resolution
- On screen menu guides

£415 ex vat £487.62 inc vat

**Diamond Scan 50**

- 15" FST
- 13.8" viewable screen
- 0.28mm dot pitch
- 1280 x 1024 @ 60Hz max resolution
- Meets the latest industry environment and safety standards

£119 ex vat £139.82 inc vat

LCD 40	£649	£762.57	DiamondPlus 72	£285	£334.87
LCD 50	£739	£868.32	DiamondPlus 100	£389	£809.57
DiamondScan 70	£185	£217.37	DiamondPro 91TXM	£659	£774.32
DiamondScan 90	£365	£428.87	DiamondPro 700	£379	£445.32
Diamond Plus 71	£259	£304.32	DiamondPro 1010	£1125	£1321.87

### MICROSCAN 5P 17"

- Flat screen, Invar shadow mask, anti-glare
- Ultra high resolution to 1280 x 1024 @ 60Hz
- Full screen eliminates black border
- EasyScreen on-screen menu
- Win 95 Plug & Play compatibility
- Energy Star, MPRII, TCO 95 compliant

**MICROSCAN 6P 19"**

- Flat screen, Invar shadow mask, anti-glare
- Ultra high resolution to 1600 x 1200 @ 75Hz
- Full screen eliminates black border
- EasyScreen on-screen menu
- Win 95 Plug & Play compatibility
- ProColor colour adjustment
- Energy Star, MPRII, TCO 95 compliant

Pro Vista V30	£74	£86.95	MicroScan 6G	£525	£616.87
Pro Vista E44 15"	£95	£111.62	MicroScan 4P	£109	£128.07
Pro Vista E33	£84	£98.70	MicroScan 5P	£179	£210.32
MicroScan 5G 17"	£245	£287.87	MicroScan 6P 19"	£349	£410.07
MicroScan 5GT	£265	£311.37	MicroScan 5T 14"	£599	£703.82

### HITACHI Masters of Monitor Technology

<b>CM641ET</b> £299 ex vat £351.32 inc vat	<b>CM500ET</b> £119 ex vat £139.82 inc vat
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**CM641ET 17"**

- 17" Colour display monitor
- New high contrast tube - superior display
- 0.21mm horizontal mask pitch
- Flicker free screen
- Up to 1600 x 1200 resolution
- PC, Mac and Workstation compatible
- TCO '92 compliance

**CM500ET 15"**

- 15" Colour display monitor
- Fully featured compact desktop monitor
- 0.23mm horizontal mask pitch
- Flicker free screen
- Up to 1152 x 870 resolution
- PC, Mac and Workstation compatible
- TCO '92 compliance

FST 15" ES (inc speakers)	£129	£151.57	CM812 ET 21"	£669	£786.07
CM640 ET 17"	£184	£227.95	CM813 ET 21"	£749	£880.07
CM751 ET 19"	£399	£468.82	CM814 ET 21"	£849	£997.57
CM752 ET 19"	£425	£499.37	DT3131 E LCD13.3"	£749	£880.07
CM811 ET 21"	£589	£692.07	DT3140 E LCD14.1"	£849	£997.57
			CML150X 15"	£849	£762.57

**viewpoint®**

**17" Monitor for Only**

**£139.99 ex vat**  
(£164.48 inc vat)

- 17" Monitor
- Viewable screen 15.6"
- Anti-static coating, Anti-reflective coating
- Max resolution 1280 x 1024 @ 60Hz
- Recommended resolution 1024 x 768 @ 85Hz
- Plug & Play, Win 95 compatible
- 3 year On Site warranty



- 15" Monitor
- Viewable screen 13.7"
- Anti-static coating
- Max resolution 1280 x 1024 @ 60Hz
- Recommended resolution 1024 x 768 @ 85Hz
- Plug & Play, Win 95 compatible
- 3 year On Site warranty

**viewpoint 15" Monitor** £85 ex vat £99.87 inc vat  
**viewpoint 14" Monitor** £69 ex vat £81.07 inc vat

- 19" Monitor
- Viewable screen 18"
- Anti-static coating, Anti-reflective coating
- Max resolution 1600 x 1200 @ 60Hz
- Recommended resolution 1280 x 1024 @ 85Hz
- Plug & Play, Win 95 compatible
- 3 year On Site warranty
- 21" Monitor only £599 + vat

**viewpoint 19" Monitor** £375 ex vat £440.62 inc vat  
**viewpoint 21" Monitor** £599 ex vat £703.82 inc vat

**PHILIPS** *Let's make things better.*



- 15.1" monitor (viewable size 13.8")
- Up to 1024 x 768 @ 75Hz
- Non glare polarizer display surface
- On Screen display
- Digital Control
- Built in stereo & Microphone
- Comparable to a 17" CRT monitor

**£489 ex vat**  
£575.57 inc vat



- 19" FST monitor
- Up to 1600 x 1200 @ 85Hz
- Fine 0.22mm dot pitch

**£449 ex vat**  
£527.57 inc vat



- 19" monitor (viewable size 17.9")
- Anti-glare, Anti-reflection, high contrast screen coating
- Auto power saving function (NUTEK) & low emission compliance
- 1600 x 1200 @ 75Hz
- High bandwidth at 203MHz

**£365 ex vat**  
£428.87 inc vat



- 17" monitor (viewable size 15.9")
- Up to 1280 x 1024
- Autoscan & Tilt correction
- On Screen display
- Digital Control
- Black Matrix CRT screen

**£155.99 ex vat**  
£183.28 inc vat



- 15" monitor (viewable size 13.8")
- Up to 1024 x 768
- Autoscan
- On Screen display
- Digital Control
- Black Matrix CRT screen

**£98 ex vat**  
£115.15 inc vat

Philips 151AX 15.1"	£489	£574.57
Philips Brilliance 109A 19"	£449	£527.57
Philips Brilliance 107 17"	£299	£351.32
Philips Brilliance 105 15"	£157	£184.47
Philips Brilliance 201CS 21"	£1125	£1321.67

Philips Brilliance 201P 21"	£759	£891.82
Philips Business 201B 21"	£649	£762.57
Philips Business 104B 14"	£74	£86.95
Philips Business 104S 14"	£67	£78.72
Philips Business 107MB 17"	£239	£280.82

**iiyama** VISIONMASTER MONITORS THE IMAGE OF PERFECTION



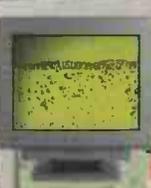
- 15" FST 0.28mm Dot pitch
- Up to 1280x1024 @ 85Hz refresh
- On-Screen Display Menu
- Colour Balance Control
- Complies with MPRII requirements

**iiyama VM 350**  
**£114 ex vat** £133.95 inc vat



- 17" FST 0.26mm Dot pitch
- Up to 1280x1024 @ 90Hz
- On-Screen Display Menu
- Colour Balance Control
- TCO 95 and MPRII compliant

**iiyama VM 400**  
**£239 ex vat** £280.82 inc vat



- 17" DiamondTron
- Up to 1280x1024 @ 90Hz
- On-Screen Display Menu
- Colour Balance Control
- TCO 95 and MPRII compliant

**iiyama VM Pro 400**  
**£285 ex vat** £334.87 inc vat



- 19" FST 0.26mm Dot pitch
- Up to 1280x1024 @ 100Hz
- On-Screen Display Menu
- Colour Balance Control
- TCO 95 and MPRII compliant

**iiyama VM 450**  
**£369 ex vat** £433.57 inc vat



- 21" DiamondTron
- Up to 1600x1200 @ 85Hz
- On-Screen Display Menu
- Colour Balance Control
- TCO 95 and MPRII compliant

**iiyama VM Pro 502**  
**£609 ex vat** £715.57 inc vat

S702GT 17"	£215	£252.62
VM 17ES 17"	£335	£393.62
VM Pro 450 19"	£399	£468.82
VM 501 21"	£599	£703.82
VM 501 Pro	£599	£703.82
VM 502 21"	£609	£715.57

**Formac UK**  
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**ProNitron 17/550**  
ProNitron 17/500 - offering excellent picture quality and features.

- 17" Multisync SONY triniton tube
- PC, MAC & UNIX comp.
- Max res: 1280 x 1024
- 0.25 mm dot pitch
- Power Save function

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£334.82 inc vat



**ProNitron 19/500**  
ProNitron 19/500 - for users who demand the highest quality.

- 19" Multisync SONY triniton tube
- Max res: 1600 x 1200 @ 80Hz
- 0.25" - 0.27mm pitch
- PC and MAC comp.
- On-Screen Display

**£415 ex vat**  
£487.62 inc vat



**ProNitron 21/650**  
ProNitron 21/700, a professional monitor for professional users.

- 21" Multisync SONY triniton tube
- Max res: 1600 x 1200 @ 85Hz
- 0.25 - 0.27mm pitch
- PC and MAC comp.
- On-Screen Display

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**FANTASTIC VALUE NEW 19" MONITOR**

- 19" Flat Screen Monitor
- 0.26mm dot pitch
- Up to 1600 x 1200 @ 75Hz
- 1280 x 1024 @ 85Hz
- Digital on-screen display
- Conforms to TCO 95



**Belnea 10 60 20**  
 £279 ex vat £329.82 inc vat

Model: 10 60 20

**GENUINE 17" DIAMONDTRON FOR JUST £229 + vat**

- 17" DiamondTron Tube
- 0.25mm dot pitch
- Up to 1600 x 1200 @ 75Hz
- 1024 x 768 @ 100Hz
- Digital on-screen display
- Conforms to TCO 95



**Belnea 10 70 50**  
 £229 ex vat £269.07 inc vat

Model: 10 70 50

**THE RANGE OF BELINEA MONITORS**

MODEL	SIZE	PITCH	EX VAT	INC VAT	MODEL	SIZE	PITCH	EX VAT	INC VAT
10 40 10	14"	0.28	£76	£89.30	10 70 65	17"	0.26	£229	£269.07
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10 50 46	15"	0.28	£104	£122.20	10 80 50	21"	0.26	£489	£574.57
10 50 80	15"	0.27	£119	£138.65	10 15 10	15"	TFT	£599	£703.82
10 70 15	17"	0.27	£210	£246.75	10 60 20	19"	0.26	£279	£327.82
10 70 60	17"	0.27	£187	£219.72	10 20 10	15"		£85	£99.87
10 70 35	17"	0.25	£229	£269.07	10 30 40	17"	0.26	£164	£192.70

**Smile** TECHNOLOGIES U.K. LIMITED

**THREE YEAR ON-SITE WARRANTY**

**CA6929SL 19" Monitor**

Ultra fine dot pitch for razor sharp picture quality, & professional controls including Colour Temperature & Dynamic Focus

- 19" Non-glare FST/Viewable 18"
- Easy-to-use On Screen Display
- Ultra High resolution to 1600 x 1200 @ 75 Hz
- Recommended resolution 1280 x 1024 @ 85Hz
- Professional 0.26mm dot pitch
- Windows 95 Plug & Play Compatibility
- Energy Star, MPR II, TCO 95 Compliant



**Smile CA6929SL**  
 £330 ex vat £387.75 inc vat

**CA6729SL 17" Monitor**

A new professional model for 1998, capable of ultra high resolutions & refresh rates. An On Screen Display provides full control of picture quality, including RGB Adjustment & Dynamic Focus

- 17" Non-glare FST/Viewable 16"
- Easy-to-use On Screen Display
- Ultra High resolution to 1600 x 1200 @ 75 Hz
- Recommended resolution 1280 x 1024 @ 85Hz
- Dot pitch 0.26mm
- Windows 95 Plug & Play Compatibility
- TCO 95 Compliant



**Smile CA6729SL**  
 £242 ex vat £284.35 inc vat

**CA6746SL 17" Monitor**

Hailed by PC Pro as managing a stable and crisp image, even in the far reaches of the screen.

- 17" Non-glare Flat Square Tube
- Easy-to-use On Screen Display
- Maximum 1600 x 1200 @ 65 Hz resolution
- Recommended resolution 1280 x 1024 @ 75Hz
- 0.26mm dot Pitch
- 17 Display Modes



**Smile CA6746SL**  
 £160 ex vat £188.00 inc vat

**CA6536SL 15" Monitor**

£106 ex vat £124.55 inc vat

All Monitors Come With a 3 Year On-Site Warranty As Standard

**Panasonic**

**SL-70**



- 17" Short Neck FST monitor
- Up to 20% more desk space
- 0.27 dot pitch, on-screen display
- 1024 x 768 @ 86Hz
- Advanced Anti-Glare
- Anti-static coating
- SL90 £439

**Panasonic SL70**  
 £262 ex vat £307.85 inc vat

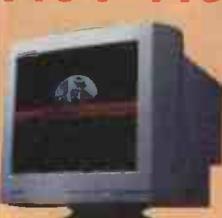
**Pro P-70**



- 17" FST Digital display
- 0.27mm dot pitch
- 1600 x 1200 @ 75Hz
- On screen adjustment menu
- Advanced Anti-glare, anti-static coat
- Power Saving function
- Superb Low price - £299 + vat

**Panasonic ProP70**  
 £299 ex vat £351.32 inc vat

**Pro P-110**



- 21" FST Digital display
- 0.25mm dot pitch
- 1600 x 1200 @ 91Hz
- On screen adjustment menu
- Advanced anti-glare, anti-static coat

**Panasonic Pro P110**  
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**LC-50**

**Panasonic LC50**  
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**Likom**

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- Viewable Image 13.6"
- 1024 x 768 Non Interlaced
- Compatibility: VGA 640 x 480, SVGA 800 x 600 @ 56/60/72/75 Hz, VESA 1024
- Memory modes: 8 factory, 12 user settings

**Likom Futura L 4031**  
 £69 ex vat £81.07 inc vat

**Futura L 5032**



- 15", 0.28mm Dot Pitch Non glare, FST
- Viewable Image 14"
- 1280 x 1024 Non Interlaced
- Compatibility: VGA 640 x 480, SVGA 800 x 600 @ 56/60/72/75 Hz, VESA 1024 x 768 @ 60/70/75/85 Hz 1280 x 1024 @ 60Hz
- Memory modes: 12 factory, 12 user settings

**Likom Futura L 5032**  
 £85 ex vat £99.57 inc vat

**Futura L 7031**



- 17", 0.26/0.27/0.28mm Dot Pitch Non glare, FST, Invar mask, Double focus
- Viewable Image 16.3"
- 1280 x 1024 Non Interlaced
- Compatibility: VGA 640 x 480, SVGA 800 x 600 @ 56/60/72/75 Hz, VESA 1024 x 768 @ 60/70/75/85 Hz 1280 x 1024 @ 60Hz
- Memory modes: 12 factory, 12 user settings

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100 sheet input tray  
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1 year Warranty

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4 high capacity Ink cartridges & 4 long-life printheads  
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Transparency sensor & job cancel button  
HP 2000CN version: Inc HP 2000C printer, HP JetDirect 300X print server & 250 sheet accessory paper tray

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HP DESKJET 895Cxi	£186	£218.55
HP DESKJET 1120C	£285	£334.87
HP DESKJET 2000C	£450	£528.75
HP DESKJET 2000CN	£675	£794.30
HP DESKJET 2500C	£705	£829.55

**HP LaserJet Printers**

**LaserJet 1100**  
£232 ex vat  
£272.60 inc vat

• 600 dpi Black plus REI  
• 8 ppm Black  
• 100 sheet input tray straight through paper path  
• Up to 6000 pages/month  
• 1 year Warranty  
• 1 MB standard memory, expandable to 9MB

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• Up to 16ppm print speed  
• 1200dpi resolution  
• 500 sheet tray  
• Up to 5 input bins (1,100 sheets)

**Other LaserJet Printers**

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LJ 8500N	£4425	£5199.37
LJ 8500DN	£5242	£6159.35
LaserJet 6P	£461	£541.67
LaserJet 6MP	£562	£660.35
Laser 4000	£741	£870.67
Laser 4000T	£807	£948.22
Laser 4000N	£941	£1105.67
Laser 4000TN	£1008	£1184.40
Laser 5000	£966	£1135.05
Laser 5000N	£1078	£1267.82
Laser 5000CN	£1701	£1998.67
Laser 8000	£1477	£1735.47
Laser 8000N	£1642	£1923.35
Laser 8000DN	£1935	£2273.62
Laser 8100	£1687	£1982.22
Laser 8100N	£1875	£2203.12
Laser 8100DN	£2145	£2520.37

**HP All-In-One Products**

**LaserJet 3100**  
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**Print:** — 600 dpi Black  
6 ppm laser  
**Copy:** — 6 ppm copier (with scan ahead to memory)  
50-200% reduce/enlarge  
**Scan:** — Sheetfed scanner  
300 dpi optical/600 dpi enhanced  
Single-Point installer  
**Fax:** — 6 secs pp (with scan ahead to memory)  
150 page memory  
175 number speed dial  
1 year Warranty  
Bi-directional parallel interface/connection

**OfficeJet 635**  
£296 ex vat  
£347.80 inc vat

**Print:** — 600 dpi Black/600 dpi Colour with HP ColourSmart  
5 ppm black/2 ppm colour  
black 1.2 cpm  
50-200% reduce/enlarge  
**Scan:** — Sheetfed scanner  
300 dpi optical/600 dpi enhanced  
**Fax:** — 20 page auto document feeder  
65 page memory  
100 number speed dial  
1 year Warranty  
Bi-directional parallel (centronics) interface

**Other All-In-One Products**

HP OFFICEJET 1170	£420	£500.00
HP OFFICEJET 1175	£414	£471.00
HP OFFICEJET 700	£321	£379.50

**InkJet Printers**

**Canon**

BJC 5500 A3 Cir	£399	£468.82
BJC 4300 A3 Cir	£87	£102.22
BJC 4650	£193	£226.77
BJC 5000	£164	£192.70

**LEXMARK**

1100	£57.99	£68.13
3200	£109.99	£129.23
5700	£137.99	£162.13
7200	£189	£222.07

**Laser Printers**

**brother**

HL-820	£154	£180.95
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HL-1050 8MB	£245	£287.87
HL-1070	£289	£339.57
HL-1070 8MB	£299	£351.32
HL-1660E	£569	£668.57
HL-1660EN	£769	£903.57
HL-1660EN 16Mb	£785	£922.37
HL-2060	£629	£739.07
HL-2060 16Mb	£649	£762.57
HL-2060N	£659	£773.07
HL-2060N 16Mb	£679	£793.07
HL-2400C	£1949	£2290.07
HL-2400CN	£2299	£2701.32

**Canon**

LBP 1760 16ppm	£625	£734.37
LBP 2460+ 24ppm	£1425	£1674.37

**Panasonic**

KX-P6300	£169	£198.57
KX-P6500	£235	£276.12
KX-P8410	£1099	£1291.32

**QMS**

DeskLaser 600	£155	£182.12
DeskLaser 1400P	£649	£762.57
DeskLaser 2000Net	£879	£1032.82
A3 Ethernet	£1299	£1526.32
A3 Duplex Ethernet	£1049	£1232.57
2060WX	£1299	£1526.32
2060BX	£1549	£1820.07
2060GX	£1975	£2320.82
2060EX	£2649	£3112.57
2425PS	£2849	£3347.57
2425EX	£4099	£4816.32
MagiColor II	£1115	£1310.12
DeskLaser	£1755	£2062.12
MagiColor II	£2455	£2884.62
CX Exec 80Mb	£889	£1044.57

**SHARP**

JX-9680 Twin Cassette	£539	£633.32
JX-9685 Duplex	£789	£927.07
JX-9865N Duplex Ethernet	£889	£1044.57
T9006	£167	£196.22
T9208	£215	£252.62
T9012	£448	£526.40
T8104 colour	£2259	£2654.32

**Faxes / Multifunction**

**Canon**

MPC-20 Colour Inkjet	£268	£314.90
MPL-90 Laser	£715	£840.12

**Panasonic**

UF-S2	£178	£209.15
UF-S1 TAM	£208	£244.40
UF-S10	£248	£291.40
KX-F2680	£184	£216.20
KX-F2780	£205	£240.87
KX-F1810	£239	£280.82
KX-F1100E	£339	£398.32
UF-302 Plain Paper	£295	£346.82
UF-260M	£758	£890.65
UF-560 Laser	£628	£737.90
UF-560 Laser	£678	£796.65
UF-342 Inkjet	£638	£749.65
UF-344 Inkjet	£878	£1031.65
UF-770 Laser	£999	£1173.82

**SAMSUNG**

SF-150	£114	£133.95
F-150	£144	£169.20
SF-910 TAM	£138	£158.65
SF-200M TAM	£188	£220.90
SF-4000 Inkjet	£224	£263.20
SF-5500 Laser	£358	£420.65
SF-5600 Laser	£488	£573.40
SF-6000 Laser	£538	£632.15
SF-6100 Laser	£598	£702.65
SF-4200 Colour Inkjet	£258	£303.15

**SHARP**

UX-108	£98	£115.15
UX-178	£114	£133.95
UX-258	£144	£173.90
FO-1460	£184	£216.20
FO-4500W laser	£1148	£1348.90
FO-1660M	£224	£263.20
F-3600M laser	£428	£502.90
TF-461 Colour	£438	£514.65
TF-601 Laser	£838	£749.65
TF-805 Laser	£748	£878.90

**Canon BlockBuster Promotion - Any customer purchasing a BlockBuster promotional Printer will be able to hire one video a week for a year!!**

(This offer applies to other printers in the range please ask your sales person for details)

**Canon BJC - 50** **BJC - 80** **LBP - 660** **BJC - 250** **BJC - 4300** **BJC - 7000**

**IMAT**

- A4 portable Colour printer - 720 x 360dpi
- 5.5ppm mono, 2.1ppm colour
- Image Optimiser technology
- Manual feed single sheet
- Built-in IrDA infra-red sensor (Win 95 and higher)
- 1 year return to Canon warranty
- Standard lithium ion battery
- Weights only 900g
- BJC 80+ Scan head £87+vat

- A4 portable Colour printer - Allows printing anywhere
- 720 x 360dpi
- 4.5ppm mono, 1.9ppm colour
- Image Optimiser technology
- 30 sheet auto sheet feeder
- Built-in IrDA infra-red sensor (Win 95 only)
- 1 year return to Canon warranty
- Optional battery packs available
- BJC 80+ Scan head £181+vat

- Personal mono laser printer
- 600dpi resolution
- 6ppm print speed
- 100 sheet auto sheet feeder
- Uses Microsoft Windows printing system
- 1 year on site warranty

- A4 Colour printer - ideal for home use
- 720 x 360dpi (mono)
- 360 x 360dpi colour
- Optional Photorealism cartridge
- 1 year return to canon warranty

- A4 Colour printer - ideal for both home & business use
- 720 x 360dpi
- Up to 4.5ppm mono, 2ppm colour
- Image Optimiser technology
- optional colour image scanner cartridge
- 1 year return to canon warranty

- A4 Colour printer - ideal for high quality DTP & Graphics
- 1200 x 600dpi
- New P-POP printing technology
- Unrivaled plain paper output
- Prints on card up to 550gsm
- Image Optimiser technology
- New large capacity cartridges
- A4+ size paper support gives full A4 bleed
- 1 year return to canon warranty

<b>Canon BJC-50</b>	<b>Canon BJC-80</b>	<b>Canon LBP-660</b>	<b>Canon BJC-250</b>	<b>Canon BJC-4300</b>	<b>Canon BJC-7000</b>
£185 ex vat £217.37 inc vat	£138 ex vat £162.15 inc vat	£158 ex vat £185.65 inc vat	£68 ex vat £79.90 inc vat	£87 ex vat £102.22 inc vat	£159 ex vat £186.82 inc vat

**MINOLTA** Minolta offer a product to suit almost every user. From the high spec, competitively-priced PagePro series to the fully fledged Colour Page Pro laser printer, each unit features engineering excellence designed to offer the best performance possible in every home or office environment.

**MINOLTA PagePro 8** £239 ex vat £280.82 inc vat

- 8 ppm, PCL 6e
- 600 x 600 dpi resolution
- 150 sheet standard paper capacity
- 500 sheet second cassette option

**MINOLTA Colour PagePro** £1525 ex vat £1791.87 inc vat

- 3 ppm full colour 12 ppm black
- Intel 33MHz RISC processor
- 4MB standard memory
- 150 sheet multipurpose tray & 250 sheet A4 cassette
- Optional 2nd 250 sheet cassette
- Upgradeable to Postscript Level 2
- True 600 dpi colour resolution

**MINOLTA PagePro 12** £539 ex vat £633.32 inc vat

- 12 ppm / 100 MHz RISC
- PCL 5e / Adobe PS option
- Ethernet / envelope cassette option
- 1250 sheets paper Input

**MINOLTA PagePro 20** £699 ex vat £821.32 inc vat

- 20 ppm A4 / 100 MHz RISC
- PCL 5e / Adobe PS option
- Ethernet / internal HD drive option
- 1150 sheets paper Input

**MINOLTA PagePro 8L** £194 ex vat £227.95 inc vat

- Ideal Desktop Laser printer with PCL 6 emulation for multi platform use, dedicated for small office and home environments

**MINOLTA PagePro 8E** £315 ex vat £370.12 inc vat

**MINOLTA PagePro 12E** £539 ex vat £633.32 inc vat

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**Original Toners**

Brother	ex vat	inc vat
HL-630/631/660	£17	£19.97
HL-730/760	£12	£14.10
HL-1060	£13	£15.27
HL-1260/1660	£61	£71.67

**EPSON**

	ex vat	inc vat
EPL-9000	£128	£150.40
EPL-N1200	£65	£76.37
EPL-N2000	£113	£132.77

**HEWLETT PACKARD**

	ex vat	inc vat
LaserJet IIP/III	£51	£59.92
LaserJet I/III	£43	£50.52
LaserJet 444/5	£41	£48.17
LaserJet 4L/4P	£42	£49.35
LaserJet 4V	£42	£49.35
LaserJet 5P/6P	£49	£57.57
LaserJet 5L	£38	£44.65
LaserJet 5Si/8000	£94	£110.45
LaserJet 4000	£54	£63.45
LaserJet 5000	£92	£108.10

**KYOCERA**

	ex vat	inc vat
FS-400	£11	£12.92
FS-1550/1600/3400/3600	£37	£43.47
FS-1700/3700	£38	£44.65
FS-1700/3700 HiCap	£43	£50.52

**LEXMARK**

	ex vat	inc vat
Optra 7k Diamond	£111	£130.42
Optra 15k Diamond	£151	£177.42
Optra 8 7k Diamond	£128	£150.40
Optra S 17k Diamond	£153	£179.77

**Inkjet Cartridges**

**Canon**

	ex vat	inc vat
BJ-10 Black	£11	£12.92
BJ-200/210/230/240/ Black	£11	£12.92
BJC-210/240/250 CI	£13	£15.27
BJC-240/250 Photo	£12	£14.10
BJC-240/250 Photo Kit	£18	£21.15
BJC-4550 Photo	£14	£16.45
BJC-4550 Photo Kit	£18	£21.15
BJC-4550	£23	£27.02
Fluorescent	£7	£8.22
BJ-300/330 Black	£7	£8.22
BJC-900 Black	£10	£11.75
BJC-800 Colour	£14	£16.45
BJC-600/610/620/630	£4	£4.70
BJC-600/610/620/630 CI	£4	£4.70
BJ-30/70 Black	£19	£22.32
BJ-30/70 Colour	£6	£9.40
Tank 3 pack	£22	£25.85
BJC-70 Colour	£6	£7.05
BJC-70 Black Tank 3 Pack	£10	£11.75
BJC-4000/5500 Bk	£17	£19.97
BJC-4200/4300 Colour	£23	£27.02
BJC-4000/5500 Black Tank	£4	£4.70
BJC-4000/5500 Colour Tank	£10	£11.75
BJC-7000 Black	£18	£21.15
BJC-7000 Colour	£20	£23.50
BJC-7000 Photo Colour	£28	£32.90
BJC-7000 Photo Ink Tank	£18	£21.15

**EPSON**

	ex vat	inc vat
Stylus 800/1000 Bk	£6	£7.05
Stylus 300 Black	£14	£16.45
Stylus Colour/Pro Bk	£8	£9.40
Stylus Colour/Pro CI	£16	£18.80
Stylus 200/820/11 BI	£11	£12.92
Stylus 200/500 CI	£17	£19.97
Stylus 1500 Black	£26	£30.55
Stylus Pro XL+ CI	£17	£19.97
Stylus 416/800/1520 Colour	£13	£15.27
Stylus 4/5/600 PBK	£12	£14.10
Stylus 200/500 CI	£17	£19.97
Stylus 800/1520 Bk	£13	£15.27
Stylus Photo 5 CI	£11	£12.92
Stylus 3000 Bk/CI	£31	£36.42
Stylus 300 Colour	£12	£14.10

**HEWLETT PACKARD**

	ex vat	inc vat
DJ 400/5xx Black	£17	£19.97
DJ 400/5xx Colour	£18	£21.15
DJ 600/670/690 Bk	£17	£19.97
DJ 720/800/1100 Bk	£17	£19.97
DJ 820/870/890	£17	£19.97
DJ 690 PhotoRealistic	£19	£22.32
DJ 720/890 Colour	£21	£24.67
DJ Port/310/320/340	£14	£16.45
DJ 1600 Bk/CI	£17	£19.97
PJ XL300 Black	£20	£23.50
PJ XL300 Colour	£21	£24.67

**LEXMARK**

	ex vat	inc vat
PS 4079 Black	£14	£16.45
PS 4079 Colour	£21	£24.67
ColourJet 77200 Bk	£18	£21.15
ColourJet 77200 CI	£21	£24.67
ColourJet 1020 Bk	£18	£21.15
ColourJet 2070 Bk	£23	£27.02
ColourJet 2070 CI	£26	£30.55
ColourJet 2050 Bk	£18	£21.15

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# EPSON



Software includes: PrintArtist v.4 - Imaging editing graphics software  
LivePix v.1 - Professional photo image editing software  
(Windows & Macintosh)  
Photo Quality Media pack - a selection of EPSON print media.  
Customisable Mouse Mat - free mouse mat that allows users to insert their own printed designs under the transparent cover.



- 3 Year extended warranty service available on all EPSON printers, scanners and video projectors
- Flexible cover - RTB or On-Site response packages
- Product history known as own product is repaired not replaced
- Warranty is transferable if product is sold on
- EPSON trained engineers and EPSON spares used
- Options also covered if included with registered product
- Refer to specific product for price

## THE NEW EPSON STYLUS COLOR 900

- Fastest colour inkjet printer - Black text 12.6ppm in mono - 12.2ppm black and colour
- EPSON Ultra MicroDot - The world's smallest ink droplet in black and colour
- high capacity dual ink cartridges for volume printing
- 1440dpi with variable sized droplet technology
- 1440dpi printing on plain paper
- PhotoEnhanced 3 for instant Image Enhancer
- Parallel, USB, Mac serial, Ethernet interface
- Win 95/98 NT 4.0, DOS & MAC
- 1 year RTB warranty
- EPSON CoverPlus 3yr warranty option

**Fastest ColourPrinter**

**£261 ex vat**  
**£306.67 inc vat**



## THE NEW EPSON STYLUS PHOTO 750

Highest Quality Photo Printer for Everyday Needs

- EPSON Ultra MicroDot technology
- 1440dpi with variable-sized Droplet Technology
- EPSON PhotoEnhanced 3 for Optimisation of Digital Images
- Enhanced print speeds for Photo's, graphics and text
- Optimised for photo quality
- 1440dpi printing on plain paper
- Parallel, USB, MAC serial, Type B
- Built-in Parallel and USB ports
- Win 95/98, NT 4.0, DOS & MAC
- 1 year RTB warranty as standard
- EPSON CoverPlus 3yr warranty option



**£177 ex vat**  
**£207.97 inc vat**

## THE NEW EPSON STYLUS PHOTO 1200

Highest Quality A3+ Photo Printer for Everyday over size printing needs. Needs

- EPSON Ultra MicroDot 6pI™
- 1440dpi with variable-sized Droplet Technology
- EPSON PhotoEnhanced 3
- High capacity dual ink cartridges for volume printing
- Paper roll option
- Enhanced print speed in quality and graphics
- 1440dpi printing on plain paper
- PostScript option available
- Win 95/98, NT 4.0, DOS & MAC
- 1 year RTB warranty as standard
- EPSON CoverPlus 3yr warranty option



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## THE EPSON STYLUS COLOR 740

EUltra MicroDot - The World's smallest ink droplet!

- 1440dpi with Variable-Sized Droplet Technology
- Advanced PhotoReal colour printing
- 40% Speed Improvement
- Parallel, Serial & USB interfaces
- Win 95,98,NT 4.0 & MAC compatible
- Highest quality output on all media types inc plain paper
- Advanced 4 colour Dual-Cartridge Ink System
- New Printer Driver Enhancements
- New full function Status Monitor
- Free NEW Advanced 'PerfectPicture Pak' software & paper media bundle



**£147 ex vat**  
**£172.72 inc vat**

## THE EPSON STYLUS COLOR 640

A perfect introduction to colour printing at home

- 1440dpi colour & true black printing with EPSON Super MicroDot
- Fast print speeds
- EPSON PhotoEnhanced 3 for Optimisation of Digital Images
- Windows 95 & 98 compatible
- High quality output on all media types including plain paper
- Free NEW 'PerfectPicture Pak' software bundle
- Advanced Dual-Cartridge Ink System
- New Printer Driver Enhancements
- New full function Status Monitor



**£118 ex vat**  
**£138.65 inc vat**

## EPSON STYLUS COLOR 440

- 720dpi PhotoReal colour & black printing
- Designed for ease of use - Ideal for first time buyers
- High quality output on all media types including plain paper
- Advanced Dual-Cartridge Ink System
- New Printer Driver Enhancements
- New full function Status Monitor



**£89 ex vat**      **£104.57 inc vat**

## EPSON GT-9600 Scanner

- Optical Resolution 800 x 3200dpi with Micro Step Drive
- 36bit colour scanning and output
- Dynamic range of 3.3D
- EPSON Advanced Scanning Technology
- High speed scanning - a leader in it's class
- 1 year RTB with optional 3 year extended warranty



**From £411 ex vat**      **£482.92 inc vat**

## EPSON STYLUS PHOTO 700

- 1440dpi Photo Reproduction Quality output
- Prints on a wide range of media
- EPSON PhotoEnhanced 2 - automatically optimises photo output
- Win 3.1, Win 95, Win NT and Mac compatible
- 1 Year RTB Warranty

**£133 ex vat**      **£156.27 inc vat**

FilmScan 200	£190	£223.25	Stylus Pro 5000	£1687	£1982.22
StylusColor 300	£76	£89.30	PhotoPC 600	£249	£292.57
StylusColor 800	£207	£243.22	EPL-N1200	£593	£696.77
StylusColor 850	£207	£243.22	EPL-N1200EN	£791	£929.42
StylusColor 1000	£292	£343.10	EPL-N1200PS	£986	£1158.55
StylusColor 1520	£315	£370.12	EPL-N2000	£954	£1120.95
StylusColor 3000	£820	£963.50	EPL-N2000PS	£1193	£1401.77
StylusPhoto	£147	£172.72	EPL-5700EN	£373	£438.27
StylusPhoto EX	£308	£361.90	EPL-5700PS	£373	£438.27

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4Mb RAM as standard - upgradable to 36Mb  
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1 Year RTB Warranty with Optional 3 year Epson Cover Plus warranty

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**FREE EPSON Stylus COLOR 440**



**FREE**



**EPL-N1600 Laser Printer**

Fast 16ppm printing for demanding workgroup applications  
Superb 1200 dpi class printing with Epson's unique MicroGray and BiRiTech printing technology  
Comprehensive network connectivity including support for Novell, Windows 3.1x/95/98/NT, Unix, Apple, IBM and many other platforms.  
Extensive paper input capacity of up to 830 sheets with 3 different paper sources Optional duplex unit for two sided printing  
1 Year On site Warranty with Optional Epson Cover Plus for 3 Year On Site warranty

£596 ex vat  
£700.30 inc vat

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**FREE**



**EPL-N2000 Laser Printer**

True 600 x 600 dpi resolution with BiRiTech - offering print quality normally only found with 1200 dpi printers  
4 Mb RAM as standard - expandable to maximum of 64 Mb  
Two high speed bi-directional parallel Interfaces - supporting IEEE 1284 Nibble mode and ECP capability  
Versatile paper handling - up to A3+ paper size; integral 250 sheet feeder can be expanded to maximum capacity of 1150 sheets

£954 ex vat  
£1120.95 inc vat

**FREE EPSON Stylus COLOR 640**



**FREE**



**EPL-N4000 Laser Printer**

Fast 40 ppm printing for the most demanding departmental applications  
Superb 600 dpi class printing with Epson's unique BiRiTech technology  
Extensive media printing capabilities on sizes up to A3  
2 x 500 sheet paper cassettes, 500 sheet offset stacker and 50 sheet MP tray as standard  
Extensive range of paper options including high capacity paper feeding unit (1x 500 A4/A3, 2 x 1000 A4 (max. 3550 sheets), Duplex unit and Envelope feeder, 10 Bin Mailbox and 3 bin staple finisher

£1944 ex vat  
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**FREE EPSON Stylus COLOR 640**



**FREE**



**EPL-C8000 Colour Laser Printer**

High speed colour laser 4 ppm colour, 16 ppm monochrome  
High resolution 1200 dpi class printing with EPSON AcuLaser Colour Halftoning technology  
A3W paper capability for full A3 bleed and double A4 spreads  
Flexible paper handling up to 400 A3 sheets as standard (150 sheets A3W)  
Advanced colour printer driver

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**TRUMP CASTLE**  
**STRIKE BASE**

**FAMILY PACK**

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**OXFORD INTERACTIVE ENCYCLOPEDIA**  
**LETS START LEARNING**  
**THINK & TALK FRENCH**  
**KITCHEN GOURMET**  
**DESIGN CENTRE 3D**  
**TYPING TUTOR PRO**

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People to People Technology

Take a look at the new Oki page printers, all offering the superb performance and reliability you can expect from Oki. Fast print speeds, excellent quality and flexible paper handling, as well as Oki's LED print technology, ensure that you get the most out of whichever Oki page printer you choose.

**OKI PAGE 4w Plus**   **OKI PAGE 8P**   **OKI PAGE 10ex**   **OKI PAGE 12i/n**



- LED 4ppm page printer
- 600 dpi resolution
- Near-silent printing
- Windows 3.1/3.11, Windows 95/NT

**£135 ex vat**   £158.63 inc vat



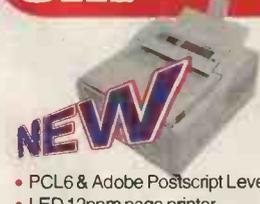
- LED 8ppm page printer with PCL6
- 600 x 1200 dpi resolution
- 2Mb RAM, upgradeable to 6Mb
- DOS, Windows 3.1/95/98 + WinNT

**£189 ex vat**   £222.07 inc vat



- LED 10ppm page printer with PCL6
- 600 x 1200 dpi resolution
- 2Mb RAM, upgradeable to 35Mb
- DOS, Windows 3.1/95/98 + WinNT
- 250 sheet paper tray with optional 500

**£239 ex vat**   £280.82 inc vat



- PCL6 & Adobe Postscript Level II
- LED 12ppm page printer
- 600 x 1200 dpi resolution
- 4Mb RAM, upgradeable to 36Mb
- Ethernet 10 Base T as standard
- DOS, Windows 95/98 + WinNT

**£409 ex vat**   £480.57 inc vat

**OKI PAGE 16n**   **OKI PAGE 20n**   **OKI PAGE 8c**   **OKI FAX 610**



- LED 16ppm page printer
- 600 x 600 dpi resolution
- 6Mb RAM, upgradeable to 66Mb
- Up to 1200 sheet paper capacity
- 10 seconds to first print
- Optional network interface card

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- LED 20ppm page printer with PCL6
- 600 x 1200 dpi resolution
- 8Mb RAM, upgradeable to 68Mb
- Standard 530 sheet paper tray
- 7 seconds to first print
- Optional network interface card

**£729 ex vat**   £856.57 inc vat



- LED 8ppm with PCL6 & Postscript III
- 600 x 600 dpi resolution
- 16Mb RAM, upgradeable to 80Mb
- 500 sheet paper tray with optional 500
- Optional network interface card

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- Plain paper facsimile
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Excellent print quality, user friendliness, small footprint, versatile document handling, and environmental consciousness... Panasonic's KX-P6300 laser printer is the perfect choice to open your Windows to true printing productivity!



- Outstanding 600 dpi class resolution
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- On-Screen animated help serves as visual guidance
- Photo enhancement and overlay provide greater versatility
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**Panasonic KX-P6300**  
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- Up to 1200 x 1200 dpi
- Up to 4.7 ppm color print speed
- Up to 14 ppm mono print speed
- 80Mb memory standard
- Flexible Paper Handling
- 1 year on-site limited warranty Super Service

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## KX-P6500

**Panasonic KX-P6500**  
**£235 ex vat**   £176.12 inc vat

## brother



**brother HL-820**

- 8ppm print speed, 600dpi print resolution
- 2Mb of standard memory
- 200 sheet paper input
- Semi automatic double sided printing
- Intelligent sleep mode, Auto wake up
- Low running costs
- Auto e-mail printing (POP3 required)

**£154 ex vat**   £180.95 inc vat



**brother HL-1040**

- 10ppm print speed, 600dpi
- 2Mb standard memory
- Network connectivity option
- Windows/DOS compatible
- Semi automatic duplex
- Intelligent sleep mode, Low running costs
- Auto e-mail printing (POP3 required)

**£175 ex vat**   £205.62 inc vat



**brother HL-1050**

- 10ppm print speed, 66Mhz RISC processor
- 1200dpi resolution,
- 4Mb standard memory upgradeable to 36Mb
- PCL6 compatible, Network connectivity option
- Multiple emulations
- IEEE 1284 & Universal Serial Bus Interfaces
- Semi automatic double sided printing
- Auto e-mail printing (POP3 required)
- Intelligent sleep mode, Low running costs

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**brother HL-1070**

- 10ppm print speed, 1200dpi resolution
- 4Mb standard memory expandable to 36Mb
- Network connectivity option, Dual paper tray as standard
- PCL6 & PostScript 2 language emulation as standard
- Intelligent sleep mode, Low running costs
- Auto e-mail printing (POP3 required)
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600 x 600 dpi fine resolution.

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True 1200 x 1200 dpi resolution

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6 - colour photo capable\*  
\*using the optional Photo Print Cartridge

**Media**  
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- Duplex standard - two sided printing
- Two built-in 250 sheet universal trays
- Long-life recyclable cartridges

**XEROX 4512** £699 ex vat £821.32 inc vat

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- 600 x 600 dpi colour and mono resolution
- Up to 12 pages per minute performance
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- Multiple media versatility
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**XEROX C55** £1499 ex vat £1761.32 inc vat

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- Up to 1ppm colour

**XEROX HomeCentre** £149 ex vat £175.07 inc vat

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**DOCUPRINT XJ4C/6C/8C**

- 4 ink print head system
- Prints 6 ppm Mono, 1.5 ppm Colour
- Suitable for both DOS and Win Printers
- Free Image software enhancement
- 600x600 dpi (1200x600 dpi High res)
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- Separate Ink cartridges
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- Laser Sharp waterproof black printing
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**XEROX XJ4C** £89 ex vat £104.57 inc vat

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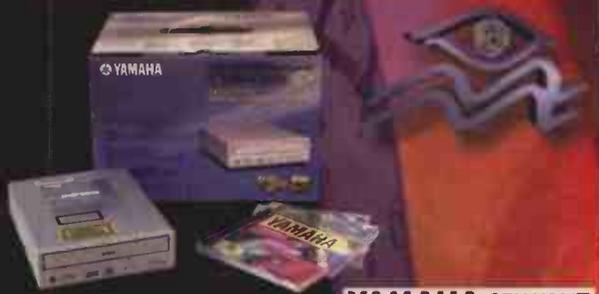
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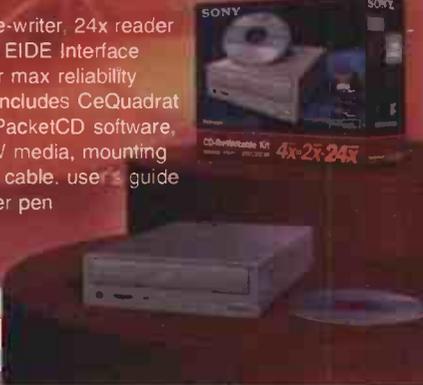
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7200i

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£205.99 ex vat  
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Formats CD-RW media in under 5 mins - as simply as formatting a floppy disk. Up to 24 speed read: 4 speed write for CD-R and 2 speed write for CD-RW. Creates CDs compatible with most future DVD ROM and DVD+RW players. Drag and Drop files onto CD or write direct to disc from applications (Windows 95,98 & Win NT v4.0). Inc software (please ask)  
• One-year warranty

HP Branded\* ReWritable CD  
\*HP Branded\* ReWritable CD x 3

£19 £22.32  
£39 £45.82

**CD-WRITER 4802 TE**

**2x8 CD-R**

**MITSUMI CR 2801TE**

£99.99 ex vat £117.48 inc vat

Mitsumi's new CR-4801TE lets you easily create custom CD's holding up to 650Mb of data or 74 minutes of audio - in around 15 minutes!

- Combines a 4x writer and 8x reader
- Playback Speed: 1200KB/s
- Write up to 650Mb of data per disk
- Easy installation
- Unique dust-proof design reduces the possibility of writing errors, increases reliability
- 2Mb buffer cuts underruns and gives high data accuracy
- ATAPI Enhanced IDE interface
- Windows 95 Compatible.
- Ideal for data intensive applications such as multimedia, electronic publishing, training, promotional tools, and data archiving.
- 1 year warranty

**MITSUMI CR 4801TE**

£134.99 ex vat £158.61 inc vat

**Mitsumi's new CR-4802TE**

- Combines a 4x writer 2x rewriter and 8x reader
- Playback Speed: 1200KB/s
- Write up to 650Mb of data per disk
- Easy installation
- Unique dust-proof design reduces the possibility of writing errors, increases reliability
- 2Mb buffer cuts underruns and gives high data accuracy
- ATAPI Enhanced IDE interface
- Windows 95 Compatible.
- Complete kit includes, CeQuadrat WinOnCD v3.6, package of 2x CDR media, 2x CD-RW media & a user's manual
- 1 year warranty

**MITSUMI CR 4802TE**

£159 ex vat £186.82 inc vat



**PHILIPS** Let's make things better.



**CDD3610 EIDE Full Kit**

(inc. 2x2x6 CD-RW, EZ CD Creator, Cables, 1 x CDR & Manuals)

**Amazing Value CD-RW only**

**Parallel port Internal Kit**

**PHILIPS CDD3610**

£189.99 ex vat  
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**SCSI Internal Kit**

**PHILIPS CDD3600**

£159.99 ex vat  
£187.98 inc vat

**PHILIPS**

£143.99 ex vat  
£169.18 inc vat

**CD-ROM, CD-RECORDABLE, CD-REWRITABLE. ALL IN ONE.**

Just what you've always wanted is now available. The CD-Rewritable Kit from Philips. You get a 6X CD-ROM player that lets you create your own CD's. Play any CD-ROM, record information on low cost CD-Recordable (CD-R) media and write or rewrite standardized CD-Rewritable discs.

**PCW** ★★★★★

"The future for desktop removable storage". "The combination of CD-R and CD-RW in one drive is simply too useful to ignore".

**COMPUTER BUYER** ★★★★★

"A cheap CD-RW drive that's got plenty going for it in terms of flexibility".

**PC Format Rating 92%**

"Our outright winner has everything going for it. And it's also pretty darn good-looking, to boot".

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# td OEM Hard Drives & Backup

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### Hard Drives

FUJITSU	
IDE	ex vat inc vat
MPB3021 2.1GB	£68 £79.90
MPB3032 3.2GB	£72 £84.60
MPB3043 4.3GB	£79 £92.82
MPB3064 6.4GB	£99 £116.32
MPB3084 8.4GB	£119 £139.82
MPB3102 10.2GB	£144 £169.20
WESTERN DIGITAL	
IDE	
WDAC22500 4.3GB	£89 £104.57
WDAC33200 5.1GB	£89 £104.57
WDAC34300 6.4GB	£94 £110.45
WDAC35000 8.4GB	£109 £128.07
WDAC36400 10GB	£126 £146.87
WDAC38400 13GB	£156 £182.12
WDAC31010 20GB	£209 £245.57

### Back-Up Devices

Panasonic	
PD Drive 650Mb IDE	£179 £210.32
PD Drive 650Mb P	£224 £263.20
PD Drive 650Mb S	£199 £233.82
Quantum	
DLT 4000 SCSI	£1599 £1878.82
DLT 7000 SCSI	£3599 £4228.82
Seagate	
Tapestor 8000L IDE	£153 £179.77
Tapestor 8000S SCSI	£159 £186.82
Tapestor 8000S Ext	£225 £264.37
Seagate DAT	
STD2400N 4GB	£329 £386.57
STD2800N 8GB	£419 £492.32

SONY	
SDT-6200 SCSI	Call
SDT-7000 SCSI	£429 £504.07
SDT-9000 SCSI	£559 £656.82
TSL-7000 Autoloader SCSI	£1159 £1361.82

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 KITCHEN GOURMET  
 DESIGN CENTRE 3D  
 TYPING TUTOR PRO

## The 100Mb Power Diskette

Zip is 20 times as fast and offers 70 times the space of a traditional floppy.

- 100Mb and 25Mb capacity
- Affordable personal storage and backup
- Fast, Easy, Worry-free back-up
- Zip Tools software included
- Move your work easily to any location



Zip Drive Int Retail	£55	£64.62	Zip Ext + 6 Disks	£89.95	£10.73
Zip Drive Int OEM	£49.95	£58.69	Zip Zoom Card	£24	£28.20
Zip Drive Ext/SCSI	£69	£81.07	Zip 100Mb Disk	£5.99	£7.03
Zip Drive USB	£79.99	£93.98	Zip Disk 6 Pack	£35	£41.12

## zip 2.5 The Buz MultiMedia

The easiest way to get multimedia into your PC, personalise it, and share it with others!

- Ultra SCSI technology
- Data transfer rate of up to 20MB/sec
- Motion JPEG video capture and Play back
- Onboard hardware compression up to 80:1
- 768x 576 @ 25 frames per second
- In/Out connectors for S-Video, composite video & Stereo Audio
- VideoWave SE Plus, HotShots, RecordIt



Buz MultiMedia **£109.95** £129.19

## ditto 2GB

- Int version fits any standard 5.25" bay
- 2Gb with data compression
- Win 3.1, 95, NT and OS/2 Compatible
- Ext version sits horizontally or vertically



**Ditto 2Gb Bundle consists of:**

- One Ditto 2Gb tape drive - including usual software etc.
- One large Ditto carry case. FREE!
- Three Ditto 2Gb pieces of media
- One Ditto NT driver. FREE!

Ditto 2Gb Int **£55** £64.62

## ditto Max and Ditto Max Pro

Powerful desktop storage and tape backup in one simple device

- Customise capacity with 3.5Gb, 5Gb, 7Gb and 10" cartridges
- Back up while you work
- Easy 1-step software
- Flash!File - 5 second average access time
- FullBack system recovery software



Ditto Max Pro Ext (10Gb)	£155	£182.12
Ditto Max Pro Int (10Gb)	£119	£139.82

## The 250Gb Zip Drive

The Iomega Zip drive solution is the preferred way to save, backup and collect your important files.

In keeping with Iomega's commitment to respond to our customers needs, we are proud to announce the newest extension to the Zip family - the Iomega Zip 250 drive and disks.



250Mb SCSI External	£109	£128.07
250Mb Parallel Port drive	£109	£128.07

## The 2Gb Removable

The Super-Fast, Extremely Vast personal storage Drive that gives you a whopping 2Gb per disk

- 2Gb of storage space on each Jaz cartridge
- Fast - 7.35Mb/s average transfer rate
- Ideal as a HD backup. Provides 4Gb capacity with 2.1 compression
- Complete set of software
- Packaged to suit you



Jaz 2Gb Int	£199	£233.82
Jaz 2Gb Ext	£199	£233.82
2Gb Disk x 1	£58	£68.15
2Gb Disk x 3	£144	£169.20

## hp HEWLETT PACKARD No.1. In Back-Up Solutions



### HP Colorado 5GB/8GB

Capacity up to 5GB compressed (8GB on 8GB model)  
 Sustained transfer rate of 40-55Mb/min (30-50 Mb/min on 8GB model)  
 Includes Colorado Backup V2 by Computer Associates for Win 95, Windows & DOS  
 Disaster recovery for Windows 95  
 Lowest cost HP Colorado 5GB/8GB media  
 Install Assistant software for easy installation

Colorado 5GB Int	£99 ex vat	£116.32 inc vat
Colorado 8GB Int	£129 ex vat	£151.57 inc vat



### HP SureStore T20 Int/Ext

Easy to use backup for Entry Level Servers  
 Capacity 20GB compressed  
 Includes Stac Replica for Win NT & Novell Netware  
 Up to 120 Mb/minute compressed  
 HP TapeAssure and TapeAlert for industry-leading reliability  
 Compatible with NT and Network operating systems

T20 Internal	£249.95 ex vat	£286.64 inc vat
T20 External	£294.95 ex vat	£346.56 inc vat



### HP SureStore DAT 8/24

Capacity of 8GB and transfer rate of 1Mb/s (24GB capacity, transfer rate of 2Mb/s on DAT24 model)  
 TapeAlert and HP TapeAssure for greater reliability  
 Read-After-Write data verification  
 Compatible with all major operating systems  
 HP DDS-2 media for max quality and reliability

SureStore DAT8i	£459 ex vat	£539.32 inc vat
SureStore DAT24i	£660 ex vat	£786.07 inc vat



### HP SureStore DLT 40/70

40GB of unattended backup (70GB on DLT 70 model)  
 3.0 Mb/s sustained transfer rate (10Mb/s on DLT 70 model)  
 TapeAlert and HP TapeAssure for greater reliability  
 Advanced error detection and correction techniques  
 Reliable DLT Technology  
 HP DLT media for max quality and reliability

SureStore DLT40e	£1749 ex vat	£2055.07 inc vat
SureStore DLT70e	£3649 ex vat	£4287.57 inc vat

DAT 24e	£739	£868.32	DLT 40i	£1589	£1867.07
SureStore T20Xi	£264.85	£346.56	DLT 70i	£3289	£3864.57
SureStore T20Xe	£349.85	£411.19	DAT 8e	£639	£633.32

## SUPER DISK DRIVE



- Includes 4 Imation Superdisk Diskettes
- 120MB storage on one 3.5" Superdisk Diskette
- Reads & Writes to Superdisk 120MB diskettes and standard 1.44MB floppy diskettes
- Up to five times faster than a standard floppy drive
- Parallel port for easy hook-up and portability

**Only £59.95 ex vat (£70.44 inc vat) Inc. 4 LS-120 Disks.**

MITSUBISHI		LS-120	
• Provides 120MB storage in a format compatible with conventional 3.5" HD and DD diskettes.		LS-120 Disk	Internal OEM
		£9 ex vat	£49 ex vat
		£10.57 inc vat	£57.57 inc vat



**Quantum HARD DRIVES**

CAPACITY FOR THE EXTRAORDINARY™

**FireBall EX - The NEW Super Fast HD!**

With a 9.5ms access time and a 512kb buffer the enhanced performance of the new FireBall EX Series is an attractive option for those users wanting to attain near-SCSI performance through the IDE interface. Drives are available from 2.5GB to a massive 10.2GB.



Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Fireball EX series	3.2Gb	EIDE/Ultra DMA	9.5ms	5400	£69.99	£82.23
Fireball EX series	5.1Gb	EIDE/Ultra DMA	9.5ms	5400	£85	£99.87
Fireball EX series	6.4Gb	EIDE/Ultra DMA	9.5ms	5400	£88.99	£104.56
Fireball EX series	10.2Gb	EIDE/Ultra DMA	9.5ms	5400	£134	£157.45
Fireball EX series	12.7Gb	EIDE/Ultra DMA	9.5ms	5400	£143.99	£169.18

**FireBall EL - The Choice for Power Users!**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Fireball EL series	2.5Gb	EIDE/Ultra DMA	9.5ms	5400	£62	£72.85
Fireball EL series	5.1Gb	EIDE/Ultra DMA	9.5ms	5400	£84.99	£99.86
Fireball EL series	7.6Gb	EIDE/Ultra DMA	9.5ms	5400	£104.99	£123.36
Fireball EL series	10.2Gb	EIDE/Ultra DMA	9.5ms	5400	£123.99	£145.68

**Atlas III - Ideal for workstation and high-end Users!**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Atlas III	9.1Gb	SCAUSCSI	8ms	7200	£299	£351.32
Atlas III	9.1Gb	UltraWide SCSI	8ms	7200	£299	£351.32
Atlas III	18.2Gb	SCAUSCSI	8ms	7200	£559	£666.82
Atlas III	18.2Gb	UltraWide SCSI	8ms	7200	£559	£666.82

**Viking II - For Maximum Storage Potential!**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Viking II	4.5Gb	SCAUSCSI II	7.5ms	7200	£159	£186.82
Viking II	4.5Gb	UESCSI	7.5ms	7200	£159	£186.82
Viking II	9.1Gb	SCAUSCSI II	7.5ms	7200	£269	£316.07
Viking II	9.1Gb	UltraWide SCSI	7.5ms	7200	£269	£316.07

**Bigfoot Tsunami - For the home user!**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
BFTsunami 512K cache	6.4Gb	EIDE/Ultra DMA 33	10.5ms	4000	£82.99	£97.51
BFTsunami 512K cache	8.4Gb	EIDE/Ultra DMA 33	10.5ms	4000	£123.99	£145.68
BFTsunami 512K cache	12.7Gb	EIDE/Ultra DMA 33	10.5ms	4000	£137.99	£162.13
BFTsunami 512K cache	19.2Gb	EIDE/Ultra DMA 33	10.5ms	4000	£197.99	£232.63

**FUJITSU**

Fujitsu's latest MR head and PRML technology make capacities up to 10.2GB affordable for desktop PCs whilst maintaining performance and reliability.



- The latest generation of MR heads provide even higher areal density.
- High data transfer rates up to 19.8MB/sec
- Ultra DMA 33.3MB/s
- S.M.A.R.T (self monitoring analysis & reporting technology)
- Support Security Command

Model	Capacity	Buffer	Time	Speed	ex vat	inc vat
MPC3032AT	3.24GB	256KB	10ms	5,400	£75	£88.12
MPC3043AT	4.32GB	256KB	10ms	5,400	£84	£98.70
MPC3064AT	6.48GB	256KB	10ms	5,400	£94	£110.45
MPC3084AT	8.45GB	256KB	10ms	5,400	£114	£133.95
MPC3096AT	9.74GB	256KB	10ms	5,400	£129	£151.57
MPC3102AT	10.2GB	256KB	10ms	5,400	£125	£146.87

**Hard disk drives**

As a pioneer in the disk drive industry, IBM continues to provide advanced-technology drives with the unmatched performance and reliability needed to handle today's data-intensive applications.

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
<b>Titan 14GXP</b>						
03L5261	10.1Gb	EIDE/Ultra DMA/33	9.5ms	7200	£154	£180.95
00K4071	14.4Gb	EIDE/Ultra DMA/33	9.5ms	7200	£215	£252.62
25L2659	18.0Gb	EIDE/Ultra DMA/33	9.5ms	7200	£279	£327.82
25L2661	22.0Gb	EIDE/Ultra DMA/33	9.5ms	7200	£345	£405.37
<b>Titan 16GP</b>						
00K4115	6.4Gb	EIDE/Ultra DMA/33	9.5ms	5400	£99	£116.32
00K4101	8.4Gb	EIDE/Ultra DMA/33	9.5ms	5400	£109	£128.07
00K4091	10.1Gb	EIDE/Ultra DMA/33	9.5ms	5400	£125	£146.87
00K4083	12.9Gb	EIDE/Ultra DMA/33	9.5ms	5400	£159	£186.82
00K4073	16.8Gb	EIDE/Ultra DMA/33	9.5ms	5400	£194	£227.95
25L2650	20.3Gb	EIDE/Ultra DMA/33	9.5ms	5400	£279	£327.82
25L2652	25.0Gb	EIDE/Ultra DMA/33	9.5ms	5400	£344	£404.20
<b>UltraStar</b>						
9ES 1"	9.1Gb	UltraSCSI	7.5ms	7200	£309	£363.07
9ES 1"	9.1Gb	UltraWide SCSI	7.5ms	7200	£325	£381.87
9ZX 1.6"	9.0Gb	UltraWide SCSI	6.3ms	10020	£409	£480.57
18XP 1.6"	18Gb	UltraSCSI	7.5ms	7200	£649	£762.57
18XP 1.6"	18Gb	UltraWide SCSI	7.5ms	7200	£649	£762.57

WESTERN DIGITAL Please see listings

**Seagate HARD DRIVES**

**Medalist EIDE Range**

Seagate technology Inc. is a leading provider of technology and products enabling people to store, access, and manage information. Seagate is committed to providing best-in-class products to help people get their information when, where and how they want it.



Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Medalist ST33210A	3.2Gb	EIDE/Ultra ATA3	9.5ms	5400	£78	£91.65
Medalist ST34321A	4.3Gb	EIDE/Ultra ATA3	10.5ms	5400	£85	£99.87
Medalist ST3531A	6.4Gb	EIDE/Ultra ATA3	10.5ms	5400	£99	£116.32
Medalist ST36841A	8.6Gb	EIDE/Ultra ATA3	10.5ms	5400	£105	£123.37
Medalist ST310240A	10.2Gb	EIDE/Ultra ATA3	9.5ms	5400	£125	£146.87

**Barracuda SCSI Range**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Barracuda ST34573LW	4.5Gb	LVD	8ms	7200	£275	£323.12
Barracuda ST34573LC	4.5Gb	LVD SCA	8ms	7200	£299	£351.32
Barracuda ST34573FC	4.5Gb	Fibre Channel	8ms	7200	£335	£393.62
Barracuda ST39173N	9.1Gb	UltraSCSI	8ms	7200	£319	£374.82
Barracuda ST39173W	9.1Gb	UltraWideSCSI	8ms	7200	£305	£358.37
Barracuda ST39173WC	9.1Gb	UltraWideSCSI SCA	8ms	7200	£325	£381.87
Barracuda ST39173WD	9.1Gb	Wide Differential	8ms	7200	£304	£357.20
Barracuda ST39173LW	9.1Gb	LVD	8ms	7200	£304	£357.20
Barracuda ST39173LC	9.1Gb	LVD SCA	8ms	7200	£335	£393.62
Barracuda ST39173FC	9.1Gb	Fibre Channel	8ms	7200	£335	£393.62
Barracuda ST118273N	18.2Gb	UltraSCSI	8.3ms	7200	£250	£295.82
Barracuda ST118273W	18.2Gb	UltraWideSCSI	8.3ms	7200	£250	£295.82
Barracuda ST118273WC	18.2Gb	UltraWideSCSI SCA	8.3ms	7200	£259	£303.82
Barracuda ST118273WD	18.2Gb	Wide Differential	8.3ms	7200	£250	£295.82
Barracuda ST118273LW	18.2Gb	LVD	8.3ms	7200	£259	£303.82
Barracuda ST118273LC	18.2Gb	LVD SCA	8.3ms	7200	£263	£311.82
Barracuda ST118273FC	18.2Gb	Fibre Channel	8.3ms	7200	£261	£309.82

**Cheetah Range**

Models	Capacity	Interface	Access time	Speed	ex vat	inc vat
Cheetah ST39102LC	9.1Gb	LVD SCA	6ms	10000	£416	£487.62
Cheetah ST39102FC	9.1Gb	Fibre Channel	6ms	10000	£444	£521.70
Cheetah ST118202LW	18.2Gb	LVD	6.5ms	10000	£705	£851.87
Cheetah ST118202LC	18.2Gb	LVD SCA	6.5ms	10000	£806	£947.05
Cheetah ST118202FC	18.2Gb	Fibre Channel	6.5ms	10000	£824	£972.90

**Maxtor**

All Maxtor products are backed by the No Quibble service policy, the benchmark for service and support in the industry. No Quibble includes:

- 48-hour advanced replacement
- Bulletin Board Service
- MaxFax 24-hour automated technical support
- Maxtor's commitment to total customer satisfaction
- Phone technicians availability Monday-Friday



Maxtor's DiamondMax EIDE hard drives have a reputation for outstanding performance and reliability. The new DiamondMax 4320 series is no exception. The DiamondMax 4320 family also features Formula 4 HDA and DSP - based electronics architecture, making it one of the best-performing drives in the industry. As always, every Maxtor drive is backed by unparalleled service and support, including our No Quibble service guarantee. When only the best will do, look to the DiamondMax 4320 series of drives from Maxtor.

- Supports Ultra DMA Mode for up to 33MB/s data transfer performance
- Industry-leading performance specifications
- 5,400 RPM rotational speed
- Highest capacity EIDE desktop drive available
- ANSI ATA-4 compliant PIO mode 4 / DMA 2 interface
- On-the-fly ECC maintains maximum performance while correcting multiple error bursts
- <9ms average seek
- 512K MaxCache manager algorithms
- >= 500,000 hours MTBF
- Zone density recording
- 1 inch high
- Automatic actuator lock
- Low power consumption
- ATA power saving commands
- Supports EPA Energy Star standards (Green PC friendly)
- S.M.A.R.T. System Compliant

**DiamondMax 4320 Series ULTRA DMA33**

Capacity	Interface	Access time	Speed	ex vat	inc vat
4.3Gb	ULTRA DMA	<9ms	5400	£75.99	£89.28
6.4Gb	ULTRA DMA	<9ms	5400	£87.99	£103.38
8.4Gb	ULTRA DMA	<9ms	5400	£98.99	£116.31
10.8Gb	ULTRA DMA	<9ms	5400	£117.99	£138.63
13Gb	ULTRA DMA	<9ms	5400	£148.99	£175.06
17Gb	ULTRA DMA	<9ms	5400	£159	£186.82

**DiamondMax 3400 Series ULTRA DMA33**

Capacity	Interface	Access time	Speed	ex vat	inc vat
3.4Gb	ULTRA DMA	9ms	5400	£71.99	£84.58
6.8Gb	ULTRA DMA	9ms	5400	£89	£104.57
8.4Gb	ULTRA DMA	9ms	5400	£105	£123.37
10.2Gb	ULTRA DMA	9ms	5400	£117.99	£138.63
13.6Gb	ULTRA DMA	9ms	5400	£149	£175.07

**DiamondMax Pros 2500 Series ULTRA DMA33**

Capacity	Interface	Access time	Speed	ex vat	inc vat
5.0Gb	ULTRA DMA	9ms	7200	£99	£116.32
7.5Gb	ULTRA DMA	9ms	7200	£124.99	£146.86
10.0Gb	ULTRA DMA	9ms	7200	£149.99	£176.23

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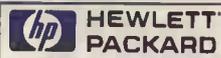
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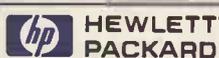
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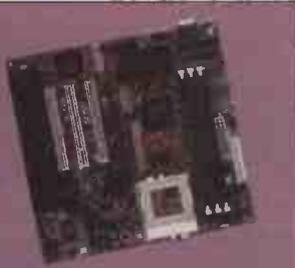
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- 3 X PCI, 2 X ISA, 1 X AGP slots
- PC health monitoring
- Baby AT Form factor

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- ALI Aladdin 5 chipset
- 100MHz Super socket 7 for AMD K6-2
- 3 X PC100 DIMM sockets
- 5 X PCI, 2 X ISA, 1 X AGP slots
- PC health monitoring
- ATX Form factor

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- DMI compliance and built-in NCR 53C810 BIOS support
- SpeedEasy for jumperless CPU upgrade or jumper emulation mode

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- SpeedEasy for jumperless CPU upgrade or jumper emulation mode
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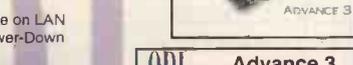
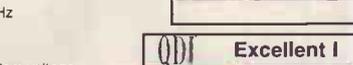
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**Inc VAT - £323.12**



**IP Router**

- Supports multiple IP addresses on the same network.
- IP filters allow control of users and protocols.
- Options to disable or route.
- Will allow TCP/IP to run even if the file server crashes.
- Low power consumption (3 watts).
- Can be managed remotely with the use of PeripheralVision® software.

**RINGDALE**  
**Ex VAT - £275**  
**Inc VAT - £323.12**



**FX-TX Media Converter**

- Converts 100baseFX fibre optic to 100baseTX copper cable connection.
- Low cost and efficient LAN interconnectivity.
- Network status at a glance with high visibility LEDs.
- Allows longer cable runs within one collision domain.
- Compact design for easy installation.

**RINGDALE**  
**Ex VAT - £425**  
**Inc VAT - £499.37**



**PrintPro®97**

- Connection to a 10baseT network.
- Plugs directly into the printer's parallel port.
- Supports all popular network operating systems and protocols.
- Supplied with a Windows TCP/IP printing system.
- Can be managed by PeripheralVision® over any TCP/IP network and over the Internet using a Web Browser.

**RINGDALE**  
**Ex VAT - £99**  
**Inc VAT - £116.32**



**PrintPro®99**

- Connection to a 10baseT Ethernet network.
- Multi-protocol printserver that can also receive & print faxes and e-mails via a mail server.
- Plugs directly into the printer's parallel port.
- Supports all popular network operating systems and protocols.
- Can receive & print Internet faxes from any IETF compliant fax machine.

**RINGDALE**  
**Ex VAT - £135**  
**Inc VAT - £158.62**



**FastPort 100**

- Allows connection to a 10baseT or 100baseTX Ethernet network.
- Simply plugs into the printer's parallel port.
- Windows based TCP/IP printing system is included.
- Can be managed by PeripheralVision® over any TCP/IP network over the Internet using a Web Browser.
- RJ-45 connection.

**RINGDALE**  
**Ex VAT - £179**  
**Inc VAT - £210.32**



**Megaswitch®10 & 20**

- 10/100base switching hubs.
- Internal power supplies.
- Can be managed by external software.
- Full-speed filtering/forwarding rates.
- Low latency store-and-forwarding switching.
- Megaswitch® 20 available in 19-inch rack mount version with only 1U height.
- NPMP™ management option.

**RINGDALE**  
**(10) Ex VAT - £299**  
**Inc VAT - £351.32**  
**(20) Ex VAT - £449**  
**Inc VAT - £527.57**



**100baseTX 16 + 2 Port Hub**

- 100baseTX compatible.
- Facilitates high density switch aggregation.
- Ability to create power workgroups.
- Low port-to-port latency minimises delays through the hub.
- NPMP™ management option.
- Compact desktop and 19-inch rack mount version with only 1U height.

**RINGDALE**  
**Ex VAT - £399**  
**Inc VAT - £468.82**



**OverLAN® ISDN Router**

- Two office or Internet connections using fast BRI (Basic Rate Interface) ISDN.
- Utilises Point-to-Point Protocol (PPP) and Multilink PPP.
- Ethernet LANs can be used via IP and IPX routing.
- Extra security offered by Password Authentication Protocol (PAP).
- Easy setup via OverLAN Commander™.

**RINGDALE**  
**Ex VAT - £289**  
**Inc VAT - £339.57**



**Internet Printing Systems (IPS)**

- Prints to network / non network printers.
- Re-directs DOS prints to an IP address.
- Direct Internet printing with Windows '95, Windows '98, NT 4.0 and NT 5.0.
- No spooling system or print queue required.
- Efficient binary data format.

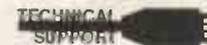
**RINGDALE**  
**Ex V T - £25**  
**Inc VAT - £29.37**



**PeripheralVision®**

- Discovers and maps out all devices on a TCP/IP Intranet and Internet.
- Various discovery methods including PING, NPMP™, DNS and SNMP.
- Ability to design networks on screen.
- High speed auto-cable function.
- Multi-lingual set-up (French, English, Italian, German and Japanese).

**RINGDALE**  
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**£132.95 ex vat**  
£156.21 inc vat

**Pace 56 Solo**  
56Kbps self-memory messaging system

- 56Kbps voice/fax/data modem with on-board memory
- Receives & stores voice & fax messages even with your PC off
- Stores a combination of approximately 30 minutes of speech or 30 pages of fax
- Retrieve your voice messages without your PC
- Retrieve your fax messages without having to view them first
- New audible UK Calling Line Identification
- Hands free speaker phone without your PC
- Flash upgradeable to future standards (V90 ready)
- Contacts you on the move to let you know you have messages waiting - remote access for message collection
- Automatically discriminates between voice, fax & data calls

**Pace 56 Voice**  
56Kbps voice/fax/data external or internal modem

- Super fast 56,000bps internet access & 33.6Kbps data transfer
- Voice mail, fax mail & email
- UK Calling Line Identification
- Flash upgradeable to future standards (V90 ready)
- Full duplex, hands free, speaker phone capability
- Private mailboxes for multiple users

**Pace NB 56 Voice**  
56Kbps voice/fax/data PC Card modem

- Super fast 56,000bps internet downloads
- Voice mail, fax mail & email
- Enhanced throughput up to 230.4Kbps
- UK Calling Line Identification
- Flash upgradeable to future standards (V90 ready)
- Ultra low power operation & standby mode

**pace**

**Pace ISDN Terminal Adaptor**  
Complete package for high speed digital communications

- Basic Rate ISDN interface (2x64K)
- Channel bonding for data transmission at 128Kbps
- Enhanced serial interface for up to 230.4Kbps
- 2 analogue ports for telephone/fax/modem connections
- Simultaneous voice & data over a single ISDN line
- Multiple Subscriber Numbering
- Euro ISDN approved for use throughout Europe

Internal **£62.95 ex vat** £73.96 inc vat External **£79.95 ex vat** £93.94 inc vat Pace NB 56 Voice **£84.95 ex vat** £99.81 inc vat Pace ISDN Terminal Adaptor **£169 ex vat** £198.57 inc vat

**Dynalink**

**MagicPress**

Internal Version also available with Headset/Microphone!!

- K56 Flex (FLASH upgradeable to V90)
- PCMCIA Type II
- Hayes compatible
- High speed 16C550 serial chip for optimum high-speed data transfer
- Includes comprehensive fax/modem software suite
- Protective cover included
- DOS/Win 3.1x/95/98/NT compatible

- K56 Flex (FLASH upgradeable to V90)
- Hayes compatible
- Includes external power supply & serial cable for connection to almost any PC
- Includes comprehensive fax/modem software suite
- DOS/Win 3.1x/95/98/NT compatible

Internal **£62.50 ex vat** £73.43 inc vat External **£47.50 ex vat** £55.81 inc vat **£57.50 ex vat** £67.56 inc vat

**MODULAR technology**

**SuperHighway 56K Internal Modem**

Internal 56K **£38.99 ex vat** £45.82 inc vat External 56K **£48.99 ex vat** £57.57 inc vat QuartzSight Kit **£49 ex vat** £57.57 inc vat ISDN TA (Internal) **£49 ex vat** £57.57 inc vat

**Rockwell** with **CONNECT**

Rockwell chipset K56flex with V.90 code and modem wizard to tell you when your ISP has upgraded to V.90. Fax/data/voice plus video with the QuartzSight camera system. Flash upgradeable, plug & play, internal telephone line splitter. QuartzSight Camera System only £49 +vat.

**Supra EXPRESS 56PRO**

**DIAMOND**

**External Highspeed 56K Modem - get V.90 now!!**

- 56K ITU Standard V.90 & Rockwell K56Flex guarantee broadest ISP access
- Engineered for 56K performance
- Upgradeable FlashROM
- Top rated data, fax and voice software
- Answering machine functionality
- Internet access software Prepared for Shotgun

DIAMOND 56K Int **£38.99 ex vat** £45.81 inc vat DIAMOND 56K Ext **£55 ex vat** £64.62 inc vat

**Hayes**

**ACCURA 56K MODEM**

- Flash upgradeable
- FAX send and receive
- FAX-on-demand
- Voice answer phone
- Microphone included
- Software and cables included
- K56Flex technology allows download speeds from the Internet at up to 56,000 bit/s.
- Dial-in to collect your messages while you're away
- V.90 COMPATIBLE

Hayes 56K Int **£71.95 ex vat** £84.54 inc vat Hayes 56K Ext **£77.95 ex vat** £91.59 inc vat

Optima 56K PCMCIA **£149** £175.08 Optima 33.6K Global PCMCIA **£119** £139.82 Optima 33.6K Business Ext **£139** £163.32 Hayes/BT Accura V90 Web Modem **£88** £103.40

**3Com U.S. Robotics**

**56K Professional Message Modem**

- Free future flash upgrade to the V.90 ITU 56K Standard
- Answerphone and message management
- Stores voice and fax messages when your PC is switched off
- Built-in voice quality speaker & microphone
- Flash ROM memory for easy upgrades

**Complete feature-rich communications package for the home or office. The Sportster Messages can be left to store incoming fax and voice messages even when your computer is switched off.**

- Flash ROM memory
- Integrates V.90 56Kbps standard & x2 technology
- Internet ready and compatible at 33,600bps
- Full duplex speaker phone
- Remote voice message, fax and data retrieval
- Call discrimination: Fax/Data/Voice with Fax-on-Demand

56K Message Pro **£105 ex vat** £123.37 inc vat

56K Message **£84 ex vat** £98.70 inc vat

56K Voice Faxmodem Includes V90 56K standard and x2 technology

- Flash ROM memory
- Integrates V.90 56Kbps standard and x2 technology
- Internet ready and compatible at 33,600bps
- Full Duplex speaker phone
- 1000 Mailbox voice mail with security
- Fax-on-Demand - up to 9 faxes stored for distribution
- Call discrimination: Fax/Data/Voice

56K Voice FaxModem **£68 ex vat** £79.90 inc vat

56K Megahertz Global **£99 ex vat** £116.32 inc vat

Megahertz 56K Global PC Card **Flash free mobile connections**

- x2 technology at up to 56Kbps
- Flash DSP/Flash ROM upgradeable
- World Ready-approved for use in over 250 countries
- Digital line guard

Couler Int ISDN 64K **£225** £264.37 Couler Int V34 **£179** £210.32 Couler I Ext **£225** £264.37 Couler Ext V34 **£179** £210.32 Sportster ISDN TA **£95** £111.62 Sportster ISDN TA WinModem 56K **£69** £81.07

**Modems**

Model	ex vat	inc vat
Supra Express 33.6K Internal	£29	£34.07
Supra Express 56K Internal	£38.99	£45.81
Supra Express 56K External	£55	£64.62
<b>Dynalink</b>		
33.6K Voice Internal	£35	£41.12
33.6K Voice External	£49	£57.57
33.6K PCMCIA	£69	£81.07
56K Voice Internal	£47.50	£55.81
56K Voice External	£57.50	£67.56
56K PCMCIA	£62.50	£73.43
<b>Grey Cell Systems</b>		
GCS 4000 33.6K PCMCIA	£145	£170.37
GSM Upgrade	£115	£135.13
<b>MultiTech Systems</b>		
MT2834ZPX 33.6K Internal	£74	£86.95
MT2834ZDXK 33.6K External	£74	£86.95
MT2834ZDXV 33.6K Voice External	£84	£98.70
MT5600ZDX 56K External	£74	£86.95
MT5600ZDXV 56K Voice External	£98	£115.15
MT2834LT 33.6K PCMCIA	£115	£135.12
MT2834BLK 28.8K External	£139	£163.32
MT5634LXI 56K PCMCIA	£125	£146.87
<b>OLITEC</b>		
SelfMemory 33600	£85	£99.87
SelfMemory 56000	£115	£135.12
SelfMemory 56000 Phone	£135	£158.62
<b>ORACLE</b>		
Gold Card Global 56 + Fax	£139	£163.32
Gold Card Global V32 bis + Fax	£99	£116.32
GSM Nokia 2110 Ug	£79	£92.82
GSM Nokia 8110 Ug	£79	£92.82
GSM Panasonic Ug	£79	£92.82
<b>TDK</b>		
DF-2814 33.6K PCMCIA	£108	£126.90
DF-3310 33.6K GSM PCMCIA	£115	£135.12
DF-5660 56K PCMCIA	£145	£170.37
<b>US Robotics</b>		
Couler Int ISDN 64K	£225	£264.37
Couler Int V34	£179	£210.32
Couler I Ext	£225	£264.32
Couler Ext V34	£179	£210.32
Sportster ISDN TA	£95	£111.62
Sportster WinModem 33.6K Int	£54	£63.45
Sportster WinModem 33.6K PCMCIA	£69	£81.07
Sportster Flash 56K	£79	£92.82
<b>Xircom</b>		
RealPort 10/100 + Modem 56	£189	£222.07
CEM56-100BTX	£179	£210.32
CE3-100BTX	£94	£110.45
CM56	£138	£162.15
Credit Card 33.6K PCMCIA	£105	£123.37
Credit Card 56K PCMCIA	£125	£146.87
GSM Global Access PCMCIA	£105	£123.37

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THINK & TALK FRENCH  
KITCHEN GOURMET  
DESIGN CENTRE 3D  
TYPING TUTOR PRO



Matched Memory

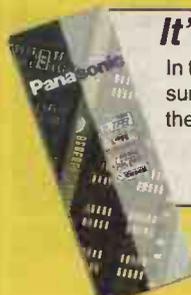
## Matched Memory

You don't have to worry about compatibility any more as each memory kit listed in the guide is supplied in quality Panasonic Packaging which contains Installation Manual, Installation Guide, Anti Static Wrist Strap and Life Time Warranty Card. Each kit is also marked with it's own product code for easy identification and finally tamper sealed. Whatever your memory needs either retail or compatible Panasonic are totally committed to become Europe's first choice for memory. As one of the worlds largest manufacturers Panasonic supply a complete range of memory solutions for the Notebook and Laptop market at the most competitive pricing. We strive to meet or beat any competitive quote in the market today and back it up with the Life Time Warranty.



### Why is Panasonic / Vtec memory better value than the rest?

- ▶ Lifetime warranty with Warranty Card included
- ▶ Matched to your PC
- ▶ Installation guide included
- ▶ Every module is 100% performance tested at factory
- ▶ Memcheck hotline 01264 356991
- ▶ Free antistatic wrist strap worth £5



### It's a fact

In the new order of memory manufacturers only the largest will survive. Panasonic is one of the largest electronics companies in the world. **Need we say more.**

Call Now for your **FREE** 240 Page Memory Guide

We can supply matched memory for virtually all Servers, Notebooks, PC's, Printers, Digital Cameras etc. **CALL:**

**Hotline: 01264 356991 Faxback: 01264 338652**

**Visit our NEW Website: www.memcheck.co.uk**

## Generic OEM Memory

	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb
30 Pin Non Parity	£8	-	-	-	-	-
	£9.40					
72 Pin Non Parity	-	£9.99	£25.99	£45.99	£96.99	£195
		£11.73	£30.53	£54.03	£113.96	£229.12
72 Pin EDO 60ns	-	£9.50	£19.99	£44.99	£85	£155
		£11.16	£23.48	£52.86	£99.87	£182.12
72 Pin Parity	-	£17.00	£28.99	£57.99	£86.99	Call
		£19.97	£34.06	£68.13	£102.21	
168 Pin Sync. Dram	-	-	£14.99	£27.99	£57.99	£109
			£17.61	£32.88	£68.13	£128.07
168 Pin BX Dimm	-	-	-	£32	£59.99	£115
				£37.60	£70.48	£135.12

**PLEASE NOTE:** Generic OEM memory is not manufactured by Panasonic & is supplied without fitting instructions.

## Panasonic



**ACER** **Amstrad** **Apple** **AST COMPUTER**  
**brother.** **COMPAQ** **COLOSSUS**  
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**TOSHIBA** **Viglen**

## Special of the Month.



### 64Mb Module for Toshiba:

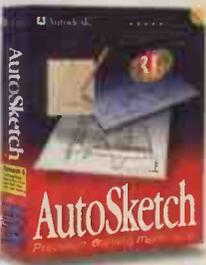
- Satellite 4010 CDT  
4000 CDS  
4005 CDS  
4000 CDT  
4005 CDT
- Portege 7000CT  
7000CT NT
- Tecra 8000

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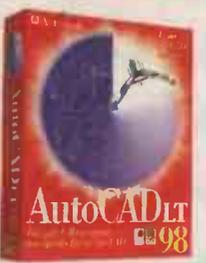


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- Unlimited redo facility.
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	ex vat	inc vat
<b>ADOBE</b>		
Pagemaker V6.5 on CD	£355	£417.13
Pagemaker V6.5 Upgrade on CD	£89	£104.58
Illustrator V7 on CD	£224	£263.20
Illustrator V7 Upgrade from V4 on CD	£75	£88.12
Pagemill V2 Windows 95 on CD	£58	£68.15
<b>MICROSOFT</b>		
Publisher 97 on CD	£65	£76.38
Publisher 97 Upgrade on CD	£29	£34.07
Publisher 98 on CD	£67	£78.72
Publisher 98 Upgrade on CD	£32	£37.60
<b>QUARK</b>		
Quark Express V4 on CD	£679	£797.82

### GRAPHICS - DESIGN

	ex vat	inc vat
<b>ADOBE</b>		
Photoshop V5 on CD	£384	£451.20
Photoshop V5 Upgrade on CD	£148	£173.90
Premier Software V4.2 on CD & 3.5	£287	£337.22
Photo Deluxe 1.0 for Win 95 on CD	£35	£41.12
Texturemaker for Win 95 on 3.5	£92	£108.10
Publishing Collection for Win 95 on CD	£639	£750.82
Acrobat V3 for Windows 3.1 & 95 on CD	£125	£146.87
Acrobat Capture V2 for Windows 95 on CD	£379	£445.32
Type Manager WP V3 on 3.5	£25	£29.38
After Effects for Windows 95 on 3.5	£408	£479.40
After Effects Pro for Windows 95 on 3.5	£814	£956.45

### OPERATING SYSTEMS

<b>NEW!! Windows 98 Full Version on CD</b>	£109	£128.07
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<b>NEW!! Plus! 98 for Windows 98 on CD</b>	£26	£30.55
Windows NT Server V4 with 5 Client Licences on CD	£539	£633.32
Windows NT Server V4 Ver Upg + 5 Client Licences CD	£278	£326.85
Windows NT Server V4 Comp Upg + 5 Client Licences CD	£279	£327.82
Windows NT Server V4 with 10 Client Licences on CD	£759	£891.82
Windows NT Server V4 Upgrade + 10 Client Licences CD	£372	£437.10
Windows NT Workstation V4 on CD	£111	£124.92
Windows NT Workstation V4 Upgrade From Prev VNT CD	£95	£116.33
Call for pricing on Microsoft BackOffice products		

### VOICE RECOGNITION

	ex vat	inc vat
<b>IBM</b>		
ViaVoice for Windows 95 on CD	£54	£63.45
ViaVoice Gold for Windows 95 on CD	£84	£98.70
ViaVoice Gold Upgrade for Windows 95 on CD	£38	£44.65
VoiceType Simply Speaking V3.0 for Windows 95 CD	£32	£37.60
VoiceType Simply Speaking Gold V3.5 for Windows 95 CD	£29	£34.07
VoiceType Dictation V3.0 for Windows 95 on CD	£459	£539.33
<b>DRAGON DICTATE</b>		
Dragon Dictate Solo for Windows 95 on CD	£19	£22.32
Dragon Dictate Solo Pro Classic for Windows 95 on CD	£64	£75.20
Dragon Dictate Naturally Speaking on CD	£79	£92.83
Dragon Dictate Naturally Speaking Personal on CD	£125	£146.88
Dragon Dictate Naturally Speaking Preferred on CD	£109	£128.07
Dragon Dictate Naturally Speaking Deluxe on CD	£439	£515.83

## Easy CD Creator V3.5

Easy to use drag-and-drop interface  
Multitrack audio or mixed mode disc recording for versatility  
Multisession capability allows incremental updates, saving on media costs

**43 ex vat**  
**£50.52 inc vat**

## Microsoft

	ex vat	inc vat
<b>FULL</b>		
Word 97	£222	£260.85
Excel 97	£222	£260.85
Access 97	£222	£260.85
Power Point 97	£222	£260.85
Office Std 97	£317	£372.48
Office Pro 97	£415	£487.62
Office Devel 97	£514	£603.95
Office 97 SBE	£324	£380.70
Publisher 97	£65	£76.37
Publisher 98	£297	£348.98
<b>UPGRADE</b>		
Word 97	£87	£102.22
Excel 97	£87	£102.22
Access 97	£87	£102.22
Power Point 97	£87	£102.22
Office Std 97	£147	£172.73
Office Pro 97	£204	£239.70
Office Devel 97	£194	£227.95
Office 97 SBE	£147	£172.73
<b>Microsoft Micros</b>		
Office 98 SBE	£34	£39.95
Publisher 98	£32	£37.60
Project 98	£114	£133.95
<b>Microsoft Micros</b>		
Visual Basic 5	£60	£70.50
Visual Basic Pro 5	£318	£373.65
Visual Basic Ent 5	£769	£903.57
Visual C++ 5	£59	£69.32
Visual C++ Pro 5	£313	£367.77
Visual C++ Ent 5	£772	£907.10
Visual InterDev 97	£324	£380.70
Visual J++ 1.1	£59	£69.32
Visual Studio Pro 97	£639	£750.82
Vis. Studio Ent 97	£899	£1056.32
Vis. Foxpro Pro 5	£318	£373.65
<b>UPGRADE</b>		
Visual Basic 5	£33	£38.77
Visual Basic Pro 5	£162	£190.35
Visual Basic Ent 5	£454	£533.45
Visual C++ 5	£33	£38.77
Visual C++ Pro 5	£163	£191.52
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Visual InterDev 97	£178	£209.15
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Vis. Studio Pro 97	£320	£376.00
Vis. Studio Ent 97	£635	£746.12
Vis. Foxpro Pro 5	£162	£190.35

### Software

	ex vat	inc vat
<b>Lotus</b>		
SmartSuite		
Millenium Edition	Call	
Millenium Ed. ug	£125	£146.87
<b>BORLAND</b>		
Delphi 4.0	£74	£86.95
Delphi 4.0 Pro ug	£229	£269.06
JBuilder 2	£74	£86.95
JBuilder 2	£379	£445.32
JBuilder 2	£219	£257.32
Turbo C++ Suite	£69	£81.07
C++ Builder 3	£73	£85.77
C++ Builder Pro	£335	£393.62
Visual dBASE 7 Pro	£235	£276.12
VdBASE 7 Pro ug	£139	£163.32
<b>Just Software</b>		
Paint Shop Pro 5	£69	£81.07
Paint Shop Pro 5 ug	£29	£34.07
<b>SYMANTEC</b>		
CrashGuard Deluxe	£29	£34.07
Uninstall Deluxe	£19	£22.32
Utilities 3.0	£69	£81.07
AntiVirus 5.0	£35	£41.12
PC Anywhere 32 V8 CD	£91	£106.93
PC Anywhere 32 V8 Host	£58	£68.15
PC Anywhere 32 V8 Rem	£65	£76.38
PC Anywhere V2	£29	£34.07
PC Anywhere V5	£29	£34.07
<b>QUARTERDECK</b>		
CleanSweep		
Deluxe 4.0	£31	£36.42
Partition-IT	£17	£19.97
Partition-IT Extra		
Strength	£17	£19.97
CleanSweep	£32	£37.60
ViruSweep	£17	£19.97
DiskClone	£25	£29.36
<b>PQ</b>		
PartitionMagic 4.0	£45	£52.87
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DriveCopy V2	£19	£22.32

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**DL450**

- **Weight:** Lightweight 9.9 pounds
- **Brightness:** 500 ANSI lumens
- **Colour Palette:** 16.7 million colours (24-bit)
- **Display:** Single-Chip DMD (Digital Mirror Device)
- **Projection Lamp:** 120-watt Metal Halide
- **Lamp Life:** 2000 hours
- **Projection Lens:** Motorized zoom 1.2:1.7 with 17-degree keystone adjusted image
- **Image Configuration:** Plug & Project auto image positioning, auto-tracking and auto synchronization
- **Audio System:** Built-in 10-watt loudspeaker
- **Warranty:** 2 Year, 24 hour swap out warranty
- **TV Tuner:** Includes built-in TV tuner

**£2239** ex vat  
£2630.82 inc vat



**PC Direct Dec 98**  
"With some clever touches such as the easy-to-use remote control handset and an aerial socket for either TV or video projection, the Davis DL 450 LiteBeam is recommended for users wanting an inexpensive, light, yet powerful projector."

**DLX650**

- **Weight:** Lightweight 9.9 pounds
- **Brightness:** 650 ANSI lumens
- **Resolution:** XGA resolution
- **Colour Palette:** 16.7 million colours (24-bit)
- **Display:** Single-Chip DMD (Digital Mirror Device)
- **Projection Lamp:** 120-watt Metal Halide
- **Lamp Life:** 2000 hours
- **Projection Lens:** Motorized zoom 1.2:1.7 with 17-degree keystone adjusted image
- **Image Configuration:** Plug & Project auto image positioning, auto-tracking and auto synchronization
- **Audio System:** Built-in 10-watt loudspeaker
- **Warranty:** 2 Year, 24 hour swap out warranty
- **TV Tuner:** Includes built-in TV tuner

**PC Magazine Jan 1999**  
"If you require a sub 5kg projector with XGA resolution, this is currently your only choice."

**£3499** ex vat  
£4111.32 inc vat



**PC Magazine Jan 1999**  
"The Davis DLX 650 is a relatively expensive ultra-portable DLP projector, but its the first with native XGA resolution and the asking price is well worth paying if thats what you need."  
Price as reviewed (ex vat) £4995

**DPB1200**

- **Brightness:** 1200 ANSI lumens
- **Resolution:** 1024 x 768
- **Colour Palette:** 16.7 million colours
- **Display:** 1.3" Polysilicon Panel x 3
- **Projection Lamp:** 330-watt Metal Halide
- **Zoom/Focus:** Electrically controlled (zoom ratio 1.3:1)
- **Image Size:** 20" to 300" (diag)
- **Audio System:** 2-watt stereo
- **Warranty:** 2 Year, 24 hour swap out warranty

**£5250** ex vat  
£6168.75 inc vat



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APRIL 1999 EDITION

ISSUE 46

# DIRECT

## focus

DABS DIRECT PRODUCT NEWS & PRICE GUIDE



**new** 100% flat front CRT  
the **Mitsubishi** 19" Diamond Pro 900u  
Award Winning Diamondtron NF CRT monitor  
...details on page 25



**new** **HP Jornada 820**  
With this convenient e-mail companion,  
there's no limit to how far you can go.  
see page 9 for details



**new** **Laser Printers**  
**Samsung** launch exciting new  
range of **laser** printers  
check out the **new** models on page 35



**new** **PhotoPC 750z**  
the **NEW** 2 Mega Pixel Digital Camera  
from **EPSON** see page 28 for details

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## CUSTOMERSERVICES 0870 129 3220 [cs@dabs.com](mailto:cs@dabs.com)

We would like to remind you of the contact numbers you may require if you have a problem. We also list our email addresses (Customer Services [cs@dabs.com](mailto:cs@dabs.com) or Technical Support [ts@dabs.com](mailto:ts@dabs.com)) which should ensure you a speedy response. Our busiest time is between 12.00pm and 2.00pm if you can try to avoid this time slot we should be able to answer your call in the shortest possible time.  
Can I also remind you to please check your products on receipt. If you have a faulty or incorrect item then follow our procedures below. Remember we replace faulty goods within 28 days of purchase.



Diane Dillon, Customer Services Manager

The CS section of your 'Direct Focus' aims to help you get efficient service and effective results from the CS department. If you would like to know more about our service commitment to you, or if you need to access that service read on...

### What do I do if my order is late in arriving?

1. Ring the sales number where you originally placed the order (or use our general sales number 0870 129 3000)
2. Quote your sales order number, account number or post code (this will enable us to find your account). We first have to establish if we have sent the order out or not. If not, usually because the product was out of stock when you ordered, and has still not arrived from our supplier, the salesperson will try to give you an up-to-date delivery date. You can then decide whether to wait, cancel, or buy an alternative product. This doesn't happen often, but when it does, the actual lead time is often indeterminate (ie the dates given to us by suppliers are not reliable). If we have sent out the product, then the problem will be with the carrier, and your call will be passed to Customer Service Department, who will take the details, call the carrier, and then call you back. Please note that our carrier Amtrak normally delivers by 1pm, so we are only able to trace late deliveries after that time.

### What if the carrier arrives but the box looks damaged?

1. Sign for the box as 'Unchecked'. Failure to do so will mean we have no claim on the carrier if the item inside is damaged in any way.
2. Ring the Customer Service number to report even if there is no damage. If your item is damaged, we will issue a returns number and arrange the collection and replacement. Please note that the collection and replacement delivery may not be on the same carrier visit.

### What do I do if the carrier arrives but the note says two boxes and he only has one?

1. Cross out the number 2 and change it to read 1. If necessary write "only one received" on the note.
2. Ring Customer Services to report and they will contact the carrier/supplier and keep you informed.

### What do I do if it's not the correct product - the delivery note does not match the goods?

1. Ring Customer Services. We will check the part number on the delivery note with the part number on your product. If the product has been shipped incorrectly a returns number will be issued and a collection and replacement arranged.

### What do I do if it's not the correct product - I ordered the wrong thing?

1. Ring us before opening or using the product. Provided the package has not been opened at all it may be accepted back with a re-stocking fee. If an agreement has been reached to take the product back a returns number will be issued. You will be responsible for the cost of returning the product and only if it is in pristine condition will a credit be raised.

### What do I do if it's not the correct product - you have not sent what I ordered?

1. Initially ring the sales number and speak to the original salesperson you ordered from.
2. Go through it with them to check that it is our misunderstanding and not yours. If we have misunderstood your requirements, you will be passed through to Customer Service, who will issue a returns number and arrange a collection and replacement.

### What if my order has just arrived but won't work?

1. Ring Technical Support on 0870 129 3350. If possible have your product close to hand to enable you to try out any fixes technical may give you. If it has been established your product is faulty you will be issued with a returns number.
2. We will arrange collection of the goods and arrange a replacement. Provided that stock is available we will try to collect and replace within 24 hours.

### What do I do if my equipment has stopped working - how do I action my warranty?

1. Ring Technical Support. They will try to establish what the fault is and offer you the warranty procedure for that product. A returns number will be issued.
2. You will return the goods to us and in turn we will send off for warranty repair. In some instances the warranty asks for the customer to ring the repair agent direct, this will be relayed to you when you call.

### PC's only

- Any software fault ring 0870 129 3350
- Hardware fault within 14 days ring 0870 129 3350
- Hardware fault outside 14 days ring 0990 133322

### What do I do if I experience a problem with software?

1. Please note that once a software package is opened you have accepted the package under the manufacturer's software licensing agreement and therefore no opened packages will be accepted back.
2. Check the details on the box are correct before opening. If a fault occurs with any disc the manufacturer will exchange. If a manual or disc is missing or incomplete the manufacturer will supply these.

When you buy from us we are here to support you...

### HELP US TO HELP YOU.

NOTE: If our Technical lines are busy and your product has direct support from the manufacturer (vendor) please ring them.

The following manufacturers (Vendors) offer technical support/DOA/warranty direct to customers.

Vendor	Number	Technical	DOA	Warranty
3COM	0800 966197	✓	✓	✓
Acer (scanners)	01379 649200	✓	✓	✓
Adaptec	0032 235 23470	✓	✓	✓
ADI	0181 236 0064	✓	✓	✓
Adobe	0131 451 6888	✓	✓	✓
Agfa	0891 615770	✓	✓	✓
Amacom	0181 993 7373	✓	✓	✓
APC	0800 132990	✓	✓	✓
ATI	0035 318 077 826	✓	✓	✓
Brother	0161 330 6531	✓	✓	✓
Belinea	0118 936 2906	✓	✓	✓
Canon	0990 143723	✓	✓	✓
Casio	0181 450 9131	✓	✓	✓
Compaq	0541 541555	✓	✓	✓
Creative	01734 344744	✓	✓	✓
CTX	01923 810801	✓	✓	✓
Daewoo	01543 504888	✓	✓	✓
Diamond	01189 444444	✓	✓	✓
Epson	01442 227277	✓	✓	✓
Evergreen	07000 808586	✓	✓	✓
Fujitsu	01925 433533	✓	✓	✓
Hauppauge	0171 378 0202	✓	✓	✓
Hayes	01252 775533	✓	✓	✓
HP	0171 512 5202	✓	✓	✓
Hitachi	0181 849 2092	✓	✓	✓
IBM	0990 509090	✓	✓	✓
Iiyama	01438 314416	✓	✓	✓
Intel	01793 404900	✓	✓	✓
Iomega	0800 973194	✓	✓	✓
Kyocera	01606 867017	✓	✓	✓
Macromedia	0800 374128	✓	✓	✓
Matrox	01793 441100	✓	✓	✓
Maxtor	003531 204 1111	✓	✓	✓
Microsoft	01189 270000	✓	✓	✓
Mitsubishi	01707 278782	✓	✓	✓
Mitsumi	01276 671029	✓	✓	✓
Motorola	0990 134810	✓	✓	✓
Mustek	01386 769429	✓	✓	✓
NEC	0181 993 8111	✓	✓	✓
Nikon	0181 541 4440	✓	✓	✓
Nokia	01794 830775	✓	✓	✓
OKI	01753 819819	✓	✓	✓
Orchid	01256 844899	✓	✓	✓
Pace	01274 537031	✓	✓	✓
Panasonic	01344 853508	✓	✓	✓
Phillips	0181 665 6350	✓	✓	✓
Pision	0181 575 9919	✓	✓	✓
Quantum	01344 353500	✓	✓	✓
Ricoh	01782 717100	✓	✓	✓
Samsung (Monitors)	01525 718444	✓	✓	✓
Sanyo	01483 301970	✓	✓	✓
Seagate	01628 894083	✓	✓	✓
Sharp (Sharpserve)	01623 413800	✓	✓	✓
Sony (Monitors Only)	0990 168648	✓	✓	✓
Tally	01734 771688	✓	✓	✓
Taxan	01344 484646	✓	✓	✓
Twinhead	01256 300300	✓	✓	✓
US Robotics	01734 441000	✓	✓	✓
Videologic	01923 271300	✓	✓	✓
Visioneer	0171 519 5023	✓	✓	✓

Customer Services . Terms & Conditions . Maps

## TERMS AND CONDITIONS OF SALE

1. EU residents pay the VAT inclusive price shown (VAT at appropriate rate, currently 17.5%). Non-EU/exempt pay the exclusive price.
2. Payment accepted by credit/debit card, bank transfer/draft, postal/money order, or cash. Credit terms (14 days) to approved accounts only (normally public sector and quoted PLCs)
3. Personal cheques over £1,000 and business cheques take up to 14 days to clear. Express clearance available at a small charge.
4. Finance and leasing available subject to status. Details available on request.
5. We do not warrant the suitability of goods for any particular purpose, and you should check specifications and suitability with manufacturers before ordering.
6. Goods not sold on a trial basis.
7. Goods offered subject to being unsold. In the event of non-availability of goods, we reserve the right to rescind the contract.
8. All goods remain Dabs Direct property until paid for in full.
9. Prices and manufacturers specifications subject to change without notice. Minor specification variations do not entitle the purchaser to rescind the contract. Prices may change because of currency fluctuations.
10. Claims for damage, non-functionality, and mis-shipping must be made within seven days of receipt.
11. After this date, and in all circumstances after 28 days, repair and not replacement will be offered.
12. A restocking fee of up to 25% is charged on returns, which prove to be non-defective.
13. You must use any manufacturer or on-site arrangements provided.  
On-site maintenance applies in mainland GB only. Details of maintenance in other areas will be supplied on request.
14. All returns must be in stock condition and be authorised by Dabs Direct.
15. No opened software will be accepted for credit. Faulty discs swapped by manufacturer.
16. You are responsible for ensuring safe delivery of the returned item.
17. We are not liable for any consequential loss or expenses, howsoever caused, including incidental returns costs.
18. If part of these terms is found to be unlawful, it shall not affect the validity of the remainder.
19. These terms and conditions do not affect consumer statutory rights.
20. Errors and omissions excepted.

A full copy of the terms and conditions is supplied on the reverse of every invoice, and is available on request. E.&O.E

## CARRIAGE

Standard GB/N.Ireland/IOM 1-3 working days	£10.00 (£11.75)	SMALL/LOW COST ITEMS
Next working day	£15.00 (£17.62)	Standard UK 1-3 working days £5.00 (£5.87)
Channel Islands/Eire 1-3 days	£20.00 (£23.50)	Next working day £7.50 (£8.81)
Saturday (Mainland GB & N.Ireland)	£20.00 (£23.50)	Call for quotes on other areas/times

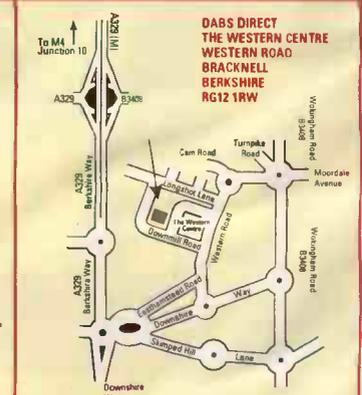
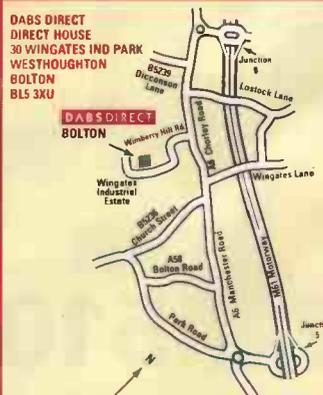
PRICES ARE PER ORDER NOT PER BOX. PRICES IN BRACKETS INCLUDE VAT.  
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range of payment plans (subject to status)  
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CREDIT CARD PAYMENTS - We can also accept payment by all major credit cards including AMEX, VISA & Mastercard

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### INTRODUCTION



Hello and welcome to the April issue of Direct Focus. We are delighted to announce that we have now been appointed a Toshiba Authorised Reseller. This is no 'rubber-stamp' certification - we have trained sales specialists, and set up a repair centre for all Toshiba notebooks (wherever purchased) to do free warranty repairs. Email [toshiba@dabs.com](mailto:toshiba@dabs.com) for details.

Our sister publication 'Professional Focus' which lists IT products and solutions for business and organisations has been doubled in size this month. For a free subscription to this 132-page monthly catalogue, please ring 0870 129 3010 or email [corporate@dabs.com](mailto:corporate@dabs.com) with your name, job title, and business address.

Don't forget [www.dabsol.net](http://www.dabsol.net) is the only free service that you can sign up for on-line without having to install a CD. Use your office browser to sign up today, print out the settings, then set your PC up at home tonight.

*David Atherton*

David Atherton, Managing Director, Dabs Direct PLC [da@dabs.com](mailto:da@dabs.com)

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### WHAT'S NEW

## WHAT'S NEW IN THIS ISSUE...

### • Dabs Direct enhanced range of PC system

The range of PCs on offer from Dabs Direct now offer a wider variety of machines, all at competitive prices, with specifications designed to meet your requirements.

\* Every PC includes 'Learn to use Windows CD' for entry level PC training

\* Every PC includes 56K Modem & Dabsol ISP (Free internet access) making every machine totally internet enabled for downloading programs, net surfing, getting online support, and playing games.



Dabs PC systems now consist of the following ranges:

#### ATLANTIS SYSTEMS

With the latest design in integrated motherboards, the Atlantis range offer excellent value for money without compromising on features. All models include Intel's™ latest Socket 370 Celeron™ processors, AGP 3D accelerated video and PCI sound. Prices start from as little as £499+VAT, ranging through to £649+VAT for a 400MHz system with DVD.

#### CHALLENGER SYSTEMS

The design of the Challenger range offers flexible specifications with easy upgrade potential.

All models have Intel™ 440BX Slot 1 motherboards, allowing you to upgrade to Pentium II. They feature a Diamond Sonic Impact S90 PCI sound card with Aureal's Vortex™ wavetable synthesizer and either an 8Mb AGP ATI Rage Pro or 16Mb AGP 3dfx Banshee 3D accelerator card. The range includes the Challenger Movie which includes a complete DVD-Video system so you can watch DVD movies on your TV!

#### DISCOVERY & VOYAGER SYSTEMS

These systems offer high performance computing using premium specification components. All machines include Intel™ Pentium II® processors, ADI monitors, Creative Labs Sound cards and are network ready with a 10/100 Ethernet card.

...and don't forget, for the latest Product Releases & Special Offers go to [www.dabs.com](http://www.dabs.com)

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Saturday	09.00 - 15.00	09.00 - 15.00	Closed
Sunday	10.00 - 15.00	Closed	Closed

All prices exclude VAT and carriage (see page 2 for details). Full Terms and Conditions available on request. E&OE [03.02.99]. Prices valid from 1st to 31st March 1999. Calls may be monitored to ensure levels of service and for training purposes.



DABS DIRECT PRODUCT NEWS & PRICE GUIDE  
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If you have any comments or suggestions please write to me at the Bolton address or email me on: [dwlson@dabs.com](mailto:dwlson@dabs.com)

### IMPORTANT NUMBERS

GENERAL SALES	0870 129 3000
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Corporate Fax	0870 129 7010
Trade Sales	0870 129 3003
BRACKNELL Counter	0870 129 3900
EDINBURGH Sales	0131-556 4114
LONDON Sales	0171-582 4777
All Customer Services	0870 129 3220
All Customer Services email	<a href="mailto:cs@dabs.com">cs@dabs.com</a>
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Technical Support email	<a href="mailto:ts@dabs.com">ts@dabs.com</a>

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# Dabs PC Systems

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- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- 3D Stereo Sound
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)



Pentium is a registered trademark and MMX and Celeron are trademarks of Intel Corporation.

**£499**  
(£586.32)

## Atlantis Home

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SEPT  
1999

Entry Level Multimedia PC

- Intel Celeron™ 366MHz Processor with MMX Technology with 128k on-chip cache
- 100MHz FSB Motherboard
- 32MB PC100 SDRAM Memory
- 4.3GB UltraDMA Hard Disk
- 36x CDROM Drive
- 4MB AGP video, using system RAM
- 15" Digital SVGA Monitor
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- 3D Stereo Sound
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft Windows 98
- Lotus SmartSuite 97
- Dabs Multimedia Software Bundle (13 titles)
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)



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## Atlantis Home Pro

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Entry Level DVD Multimedia PC

- Intel Celeron™ 400MHz Processor with MMX Technology with 128k on-chip cache
- 100MHz FSB Motherboard
- 64MB PC100 SDRAM Memory
- 6.5GB UltraDMA Hard Disk
- 5x DVD ROM Drive
- 4MB AGP video, using system RAM
- 15" Digital SVGA Monitor
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- 3D Stereo Sound
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)



Pentium is a registered trademark and MMX and Celeron are trademarks of Intel Corporation.

**£649**  
(£762.57)



### What the magazines say.....

"The big selling point of the Challenger is multimedia, with Creative Labs four-point surround sound speakers, SoundBlaster Live PCI and Creative's Encore Sx DVD drive and hardware decoder."

Computer Shopper, Dabs Challenger 400 - March 1999



"Quality components plus upgrade potential combine to win Dabs the top spot".

"... Dabs has made a PC that can be upgraded quite cheaply when needed". "... it's a fine deal".

Computer Buyer, Dabs Atlantis Value - December 1998

"Amazingly, Dabs has managed to supply a Philips DVD-ROM drive and Real Magic Hollywood MPEG2 decoder card." "... a feature-rich home entertainment system at a commendable price"

PC Pro, Dabs Power 300 - December 1998



### USB Upgrade Options.....



All Dabs PC Systems include a USB port allowing up to over 127 USB Plug 'n' Play devices to be connected together. Here we have listed some USB device to compliment your Dabs System...



**VeugoScan 310U Scanner**

- Flatbed A4 30bit Colour
- 300 x 600dpi (4800dpi) resolution

£59 (£69.32 inc Vat)



**USB Digital Desktop Video Camera**

- Digital Audio camera with built-in microphone
- Streaming performance up to 176 x 144 & 352 x 288

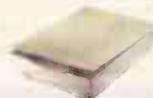
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**Stylus Color 740**

- 1440dpi with variable-sized droplet technology
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- Highest quality output on all media types

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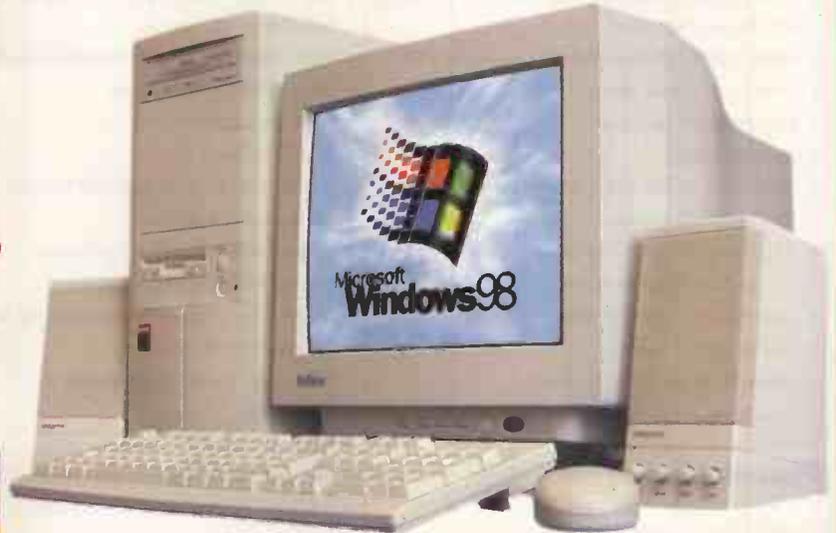
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- Intel Celeron™ 400MHz Processor with MMX Technology with 128k on-chip cache
- 100MHz FSB Motherboard
- 64MB PC100 SDRAM Memory
- 6.5GB UltraDMA Hard Disk Drive
- Creative 36x CD ROM Drive
- 4MB AGP Video, using system RAM
- 15" Digital SVGA Monitor
- 3D Stereo Sound
- Creative CSW-20 Speakers
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Joystick
- Microsoft Windows 98
- Lotus SmartSuite 97
- Dabs Multimedia Software Bundle (13 titles)
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)
- FREE Canon BJC-250 A4 Colour Inkjet Printer
- FREE Colour Flatbed Scanner
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Dabs Multimedia Software Bundle (13 titles)



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- 9600dpi maximum interpolated



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*Full Screen TV and Video from your PC*

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**Atlantis Home Office**

with FREE Canon BJC-250 Printer  
 FREE Flatbed Scanner & FREE TV Card

**only £ 799**  
 (£938.82)

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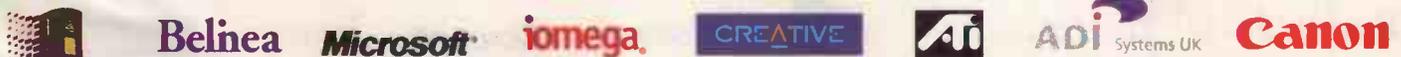
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Prices shown in brackets are inclusive of VAT



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custom build PC division

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# Dabs PC Systems

## Challenger Home

Entry Level PC



- Intel Celeron™ 333MHz Processor with MMX Technology with 128k on-chip cache
- 440BX 100MHz FSB Motherboard (Upgradeable to PII)
- 32MB PC100 SDRAM Memory
- 4.3GB UltraDMA Hard Disk
- 36x CDROM Drive
- ATI 3D Xpert 98 8MB AGP Graphics Card
- 15" Digital SVGA Monitor
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Diamond Sonic Impact S90 Wavetable PCI Sound Card
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft Windows 98
- Lotus SmartSuite 97
- Dabs Multimedia Software Bundle (13 titles)
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)

## Challenger Game

VFM Games Platform



- Intel Celeron™ 400MHz Processor with MMX Technology with 128k on-chip cache
- 440BX 100MHz FSB Motherboard (Upgradeable to PII)
- 64MB PC100 SDRAM Memory
- 6.5GB UltraDMA Hard Disk
- 36x CDROM Drive
- Creative Labs Banshee 16MB AGP Graphics Card
- 15" Digital SVGA Monitor
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Diamond Sonic Impact S90 Wavetable PCI Sound Card
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft SideWinder Joystick
- Microsoft Windows 98
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)

## Challenger Movie

VFM Entertainment DVD PC



- Intel Celeron™ 400MHz Processor with MMX Technology with 128k on-chip cache
- 440BX 100MHz FSB Motherboard (Upgradeable to PII)
- 64MB PC100 SDRAM Memory
- 8.6GB UltraDMA Hard Disk
- 5x DVD RDM Drive with MPEG2 Decoder
- ATI 3D Xpert 98 8MB AGP Graphics Card
- 15" Digital SVGA Monitor
- 56Kbps Internal Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Diamond Sonic Impact S90 Wavetable PCI Sound Card
- Creative CSW-20 Speakers
- 105 Key Windows 95 PS/2 Keyboard
- PS/2 Mouse
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)



£599 (€703.82)

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Dabs Multimedia Software Bundle (13 titles)



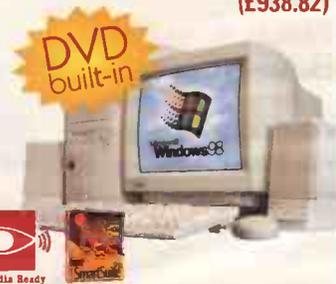
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1. The guarantee applies to the PC, monitor, keyboard and any bundled software offered as standard, and not to any printer, other software or other items ordered at the same time.
2. The PC and monitor must be returned correctly and securely packed in the original packaging as delivered. It must be undamaged, and all parts (manuals, bags etc.) must be included.
3. You are responsible for the return freight and delivery. We can arrange collection which will cost £10+VAT.

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(email [pcsales@dabs.com](mailto:pcsales@dabs.com))



Dabs PC Systems

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PRICE MATCHING - We can usually match competitors prices, please call for details.

## Dabs PC Systems

### Discovery

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Entry Level PII Business PC

- Intel Pentium II 350MHz Processor with MMX technology
- Abit 440BX 100MHz FSB motherboard
- 64MB PC100 SDRAM
- Seagate 8.6GB UltraDMA Hard Disk
- Creative 36x CDROM Drive
- ATI 3D Xpert 98 8MB AGP Graphics Card
- ADI E44 15" Digital Monitor
- 56kbps Internal PCI Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Creative Labs SoundBlaster PCI 128 Sound Card
- Creative CSW-20 Speakers
- Cherry PS/2 Keyboard
- Microsoft PS/2 Mouse
- 10/100 PCI RJ45 Network Card
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)

### Discovery Pro

PII Home & Business PC

- Intel Pentium II 400MHz Processor with MMX technology
- Abit 440BX 100MHz FSB motherboard
- 128MB PC100 SDRAM
- Seagate 10.2GB Ultra DMA Hard Disk
- 5x DVD ROM Drive
- ATI 3D Xpert 98 8MB AGP Graphics Card
- ADI E44 15" Digital Monitor
- 56kbps Internal PCI Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Creative Labs SoundBlaster PCI 128 Sound Card
- Creative CSW-20 Speakers
- Cherry PS/2 Keyboard
- Microsoft PS/2 Mouse
- 10/100 PCI RJ45 Network Card
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)

### Voyager

Ultimate PC System

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- Intel Pentium II 450MHz Processor with MMX technology
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- 128MB PC100 SDRAM
- 13GB Ultra DMA 7200rpm Hard Disk
- 5x DVD ROM Drive
- Iomega Internal ZIP100 Drive
- ATI Fury 128 32MB AGP Graphics Card
- MPEG2 Decoder Card
- ADI 5P+ 17" Monitor
- 56kbps Internal PCI Voice/Data/Fax Modem (inc free Dabsol Internet Access)
- Creative Labs SoundBlaster Live! PCI Sound Card
- Creative FourPoint Surround Speakers
- Cherry PS/2 Keyboard & Microsoft PS/2 Mouse
- 10/100 PCI RJ45 Network Card
- Microsoft Windows 98
- Lotus SmartSuite 97
- 1 Year On-Site Warranty (hardware only)
- 5 Year Labour Warranty (excluding monitor & software)



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- NEW** Tecra 8000 PII 333/64MB/6.0GB/CD/13.3"TFT
- NEW** Tecra 8000 PII 366/64MB/6.0GB/CD/14.1"TFT
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**Satellite**

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The Portégé family is specifically designed to cater for those users for whom ultimate lightweight mobility is just as important as quality, high performance and functionality. With a footprint smaller than an A4 sheet of paper, the Portégé is ideal for the frequent traveller who refuses to accept any compromise in performance levels.

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Ext 2yr Warranty	£130 (€152.75)	Call for
Spare Battery	£130 (€152.75)	Portege
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**PORTÉGE 3010CT £1329 (€1561.57)**

- Intel Pentium 266MHz MMX
- 32MB EDO RAM (expandable to 160MB)
- 3.82GB Hard Drive
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- 800x600 resolution with up to 16.7 million colours

**PORTÉGE 7010CT £1915 (€2250.12)**

- Intel Pentium II 300MHz
- 32MB EDO RAM (expandable to 160MB)
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- 12.1" TFT Colour Display
- 800x600 resolution with up to 16.7 million colours

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- 32MB SDRAM expandable to 160MB
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- 2x 32bit CardBus PC Card slots with ZV port



**Satellite 4010CDT £1185 (€1392.37)**

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- 32MB SDRAM expandable to 160MB
- 3.8GB Hard Drive
- 24xSpeed CD-ROM
- 12.1" TFT Colour Display
- SoundBlaster Pro compatible sound system
- 2x 32bit CardBus PC Card slots with ZV port



**PORTÉGE 1100CT £1099 (€1291.32)**

- Intel Pentium 233MHz with MMX
- 32MB EDO RAM
- 3.82GB Hard Drive
- 7.1" TFT Colour Display
- 800x480 resolution with up to 16.7 million colours
- SoundBlaster Pro compatible stereo sound system
- 1x 16bit PC Card slot
- IrDA compliant Infrared interface
- Optional Libretto Enhanced Port replicator

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- Intel Pentium II with 1.8v core 233MHz
- 32MB SDRAM expandable to 256MB SRAM
- 3.8GB Hard Drive
- 24xSpeed CD-ROM optional DVD ROM
- 12.1" TFT Colour SVGA Display
- SoundBlaster Pro compatible sound system
- 2x 32bit CardBus PC Card slots
- Windows 95/98 Dual Boot

**TECRA 8000CDT £1995 (€2344.12)**

- Intel Pentium II with 1.8v core 266MHz
- 64MB SDRAM expandable to 256MB SRAM
- 6.0GB Hard Drive
- 24xSpeed CD-ROM optional DVD ROM
- 13.3" TFT Colour XGA Display
- SoundBlaster Pro compatible sound system
- 2x 32bit CardBus PC Card slots
- Windows 95/98 Dual Boot
- Optional Windows NT

**TECRA 8000CDT £2245 (€2637.87)**

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- 64MB SDRAM expandable to 256MB SRAM
- 6.0GB Hard Drive
- 16xSpeed CD-ROM 2x DVD ROM
- 13.3" TFT Colour XGA Display
- SoundBlaster Pro compatible sound system
- 2x 32bit CardBus PC Card slots
- Windows 95/98 Dual Boot
- Optional Windows NT

**TECRA 8000DVD £2659 (€3124.32)**

- Intel Pentium II with 1.8v core 300MHz
- 64MB SDRAM expandable to 256MB SRAM
- 7.6GB Hard Drive
- 16xSpeed CD-ROM 2x DVD ROM
- 14.1" TFT Colour XGA Display
- SoundBlaster Pro compatible sound system
- 2x 32bit CardBus PC Card slots
- Windows 95/98 Dual Boot
- Optional Windows NT

Accessories	TECRA	Libretto
Card Station III	£250 (€293.75)	-
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- 32MB EDO RAM
- 3.82GB Hard Drive
- 7.1" TFT Colour Display
- 800x480 resolution with up to 16.7 million colours
- SoundBlaster Pro compatible stereo sound system
- 1x 16bit PC Card slot
- IrDA compliant Infrared interface
- Optional Libretto Enhanced Port replicator



Portables



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Extensa 711TE PII266 64/4000CD TFT	1575	1850.62

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Photon PII 300 64/4100CD 14.1" TFT	1799	2113.82
Xenon PII 266 96/6400CD 14.1" TFT	1899	2231.32
Xenon PII 300 96/6400CD 14.1" TFT	1999	2348.82
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1700 PII 300 32/5000CD TFT W95	1870	2197.25
3500 PII 266 32/4100CD TFT W95	1399	1643.82
3500 PII 266 32/4100CD TFT NT4	1439	1690.82
3500 PII 300 64/6400CD TFT W95	1759	2066.82
3500 PII 300 64/6400CD TFT NT4	1799	2113.82
6500 PII 300 64/6400CD TFT W95	2569	3018.57
6500 PII 366 64/6400CD TFT W95	2979	3500.32
7400 PII 266 32/4000CD TFT W95	1709	2008.07
7400 PII 300 64/6400CD TFT W95	2025	2379.32
7400 PII 366 64/10GBDVD TFT W95	2699	3171.32
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Other models available please call for details

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4100 PII 266 32/4000CD 14.1" TFT W95	1847	2170.22
4150 PII 300 64/6400 14.1" TFT W98	2370	2784.75
7150 PII 300 32/8100DVD 14.1" TFT W95	2289	2689.57
Sojourn P233MMX 64/2100 TFT	2309	2713.07
XE 266 Celeron 32/4100 12.1 DSTN W98	899	1056.32
XE PII 266PE 32/4100 12.1 TFT W98	1135	1333.62
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- 2MB Video RAM
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- DVD Module FREE with PII 266\* (option on PII 300)
- Cardbus Ready
- Lithium Ion Battery
- USB port (Dimensions 316 x 250 x 34mm)
- Weight 2.8kg
- 2 PCMCIA Type II or 1 Type III slot
- VGA, Docking Connector and PS/2 port
- Windows 98 on CD
- Lotus SmartSuite 97 on CD
- International AC Adaptor
- Deluxe carry case
- 16 bit Stereo Sound with Wavetable & SRS 3D sound

**FREE DVD module  
with Photon PII 266**

Processor

PII 266 **£1699** (£1996.32)

PII 300 **£1799** (£2113.82)

14.1" TFT



## Neutron

- Intel Mobile Module Processor with MMX Technology
- Intel Mobile Triton 82430 TX chipset
- 80Mb SDRAM (Upgradeable)
- 12.1" TFT SVGA screen
- 4.1Gb Toshiba Hard Disk Drive (Upgradeable)
- 24x CD-ROM Internal swappable with FDD
- 16 bit Stereo Sound with Wavetable & SRS 3D sound
- 2 Type II 1 type III PCMCIA slots
- Lithium Ion Battery
- USB Port
- Dimensions 303x234x52mm
- Weight 2.9kg
- Windows 98 on CD
- Lotus SmartSuite 97 on CD
- International AC Adaptor
- Deluxe carry case

Processor

P266 MMX **£1049** (£1232.57)

PII266 MMX **£1299** (£1526.32)

PII300 MMX **£1399** (£1643.82)

12.1" TFT

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*All prices on brackets are inclusive of VAT*

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VAIO747 P266MMX 32/4000CD TFT	1419	1667.32
VAIO505FX P266MMX 32/4000CD TFT	1589	1867.07
VAIO505FX/LT P266MMX 32/4000 TFT	1915	2250.12

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Libretto 110CT P233MMX 32/3820	1099	1291.32
Satellite 4000CDS PII 233 32/3800CD	995	1169.12
Satellite 4000CDT PII 233 32/3800CD	1159	1361.82
Satellite 4010CDS PII 266 32/3800CD	899	1056.32
Satellite 4010CDT PII 266 32/3800CD	1185	1392.37
Satellite 4030CDS PII 300 64/4000CD	Call	Call
Satellite 4030CDT PII 300 64/4000CD	Call	Call
Satellite 4060 XCDT PII 333 64/4000CD	Call	Call
Satellite 4060 XCDT PII 366 64/5900CD	Call	Call
Sat Pro 490XCDT PII 266 32/3800CD	1525	1791.87
Portégé 3010CT PII 233 32/3820	1329	1561.57
Portégé 7010CT PII 233 32/3800	1915	2250.12
Tecra 7800DVD PII 266 64/4830DVD	2539	2983.32
Tecra 8000CDS PII 233 32/3800CD	1329	1561.57
Tecra 8000CDT PII 233 32/3800CD	1509	1773.07
Tecra 8000CDT PII 266 64/6000CD	1995	2344.12
Tecra 8000CDT PII 300 64/6000CD	2245	2637.87
Tecra 8000DVD PII 300 64/7600DVD	2659	3124.32

### UMAX

ActionBook 330T K6 300 32/3200CD	899	1056.32
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Most models are available with MS Windows 98 or MS Windows NT, please call for details

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FolioPac 3	35	41.12
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Leather Notebook	69	81.07
Leather Organiser	35	41.12
Leather Portfolio	49	57.57
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Notepad Plus	35	41.12
Pilot	89	104.57
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PIP CABLES £30 (£35.25 inc VAT)

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\*Requires optional parallel port cables

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- One CompactFlash Type II card slot
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- Monitor (DB15) & modem (RJ11) ports
- Universal Serial Bus (USB)



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312T	233MHz	32MB	3.2GB	8.4" TFT SVGA	Ext. 24x	£1109 (£1303.07)
313T	266MHz	32MB	3.2GB	8.4" TFT SVGA	Ext. 24x	£1215 (£1427.62)
<b>Extensa</b>						
501DX	266MHz	32MB	3.2GB	12.1" HPA	20x (Max)	£939 (£1103.32)
501T	266MHz	32MB	3.2GB	12.1" TFT	20x (Max)	£989 (£1162.07)
<b>Extensa</b>						
711TE	PII 266MHz	64MB	4.0GB	13.3" TFT	24x (Max)	£1575 (£1850.62)

\*All products have an in-built 56K modem Prices shown in brackets are inclusive of VAT

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9

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MT350BXM PII 350 64/4300CD M W98	599	703.82
MT350BX PII 350 64/6400CD W98	649	762.57
MT400BX PII 400 64/6400CD W98	749	880.07
MT450BX PII 450 64/6400CD W98	849	997.57
<b>HEWLETT PACKARD</b>		
Brio Mini Tower		
7113 Celeron 300 32/2100	493	579.27
8511 PII 350 32/4300	690	810.75
8532 PII 400 64/8000 NT	916	1076.30
8533 PII 450 64/8000	1097	1288.97
Vectra VE		
VE Celeron 300 32/3200	543	638.02
VE Celeron 300 32/3200 LAN	Call	Call
VE Celeron 333 32/3200	621	729.67
Vectra VL Desktop		
VL7 PII 333 32/4300 LAN	790	928.25
VL8 Celeron 333 64/4300 LAN	824	928.25
VL8 PII 350 32/4300	802	942.35
VL8 PII 350 64/4500	1003	1178.52
Vectra VL MultiMedia Desktop		
VL7 PII 333 32/4300CDS	790	928.25
VL8 PII 400 64/6400	982	1153.85
VL8 PII 450 64/10GB DVD LAN	1317	1547.47
Vectra VL MultiMedia Mini Tower		
VL8 PII 350 32/4300	908	1066.90
VL8 PII 400 64/6400CDS	997	1171.47
VL8 PII 450 64/9000	1423	1672.02
VL8 PII 450 128/10GB DVD LAN	1432	1682.60
Kayak Desktop		
XA-s 6/350 PII 350 64/9100 SCSI	1656	1945.80
XA-s 6/400 PII 400 64/9100 SCSI	1896	2227.80
Kayak Mini Tower		
XA-s 6/350 PII 350 64/6400	1394	1637.95
XA-s 6/400 PII 400 64/6400	1652	1941.10
XA-s 6/450 PII 450 128/9100 SCSI	2173	2553.27
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	64Mb	KTC2428/64	242805-B21	87	102.22
	128Mb	KTC2428/128	Z70812-B21	107	125.72
Compaq Presario 1220	16Mb	KTC-P1600/16	293820-001	28	32.90
	32Mb	KTC-P1600/32	293821-001	59	69.32
	64Mb	KTC-P1600/64	293822-001	111	130.42
Compaq Deskpro EN, EP Series SDRAM 100MHz (non ECC)	32Mb	KTC6611/32	166612-B21	56	65.80
	64Mb	KTC6611/64	166613-B21	102	119.85
	128Mb	KTC6611/128	166614-B21	196	230.30
HP LaserJet 4000s and 5000s	16Mb	KTH-LJ4000/16	CA142A	28	32.90
	32Mb	KTH-LJ4000E/16	CA137A	36	42.30
	32Mb	KTH-LJ4000/32	CA143A	59	69.32
HP Omnibook 800CS, CT	16Mb	KTH-DB800/16	F1168A	43	50.52
	32Mb	KTH-DB800/32	F1169A	65	76.37
	64Mb	KTH-DB800/64	F1119A, F1191A	134	157.45
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	64Mb	KTH6501/64	D6502A	103	121.02
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Toshiba Portege 300, 310, 320CT	16Mb	KTT300/16i	PA2052U	80	94.00
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	64Mb	KTT300/64i	n/a	167	196.22
Toshiba Libretto 50, 70CT	16Mb	KTT-LBT/16i	PA2056U	40	47.00
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	32Mb	KTT500/32i	PA2040U, NW2040U	81	95.17
Toshiba Tecra 500, 510CDS/CDT	48Mb	KTT500/48i	PA2041U, NW2041U	114	133.95
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Kingston manufactures memory for nearly every PC, Notebook, Workstation and Server in use today.



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<b>COMPAQ</b>		
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C-Series 810c 8MB Colour	420	493.50
C-Series 2010c 24MB Colour	487	572.22
<b>HEWLETT PACKARD</b>		
360LX 8MB Windows CE v2.0	359	421.82
620LX Colour Windows CE v2.0	549	645.07
Accessories		
Please call for all 360LX and 620LX accessories		
<b>PHILIPS</b>		
Nino	249	292.57
<b>PSION</b>		
Siena 512k	99	116.32
Series 3mx 2Mb Backlit	179	210.32
Series 5 8Mb	299	351.32
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Mains Adaptor	12	14.10
Parallel Cable	29	34.07
PCMCIA Modem adaptor	79	92.82
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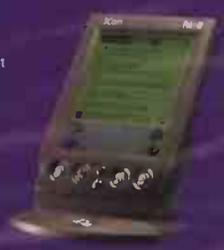
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FE116 16x100Mb Compact	185	217.37
FE508 8x100Mb Rack	185	217.37
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DPE816 16x100Mb	209	245.57
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DPE908 8x10/100Mb	159	186.82
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## 4 Port Starter Kit

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Please call for multi-pack pricing

## NETWORK CARDS

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3C-509TPO RJ45 ISA	35	41.12
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3C-900 Combo PCI	79	92.82
3C-905BTX 10/100 PCI	55	64.62
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3CXEM556T RJ45 & 56K PCMCIA XJack	145	170.37
3CXEM556C Combo & 56K PCMCIA XJack	165	193.87

## BAY NETGEAR

FA310TX 10/100 PCI	25	29.37
FA410 10/100 PCMCIA	75	88.12

## COMPAQ NETELLIGENT

10/100TX PCI	39	45.82
550 10/100 & 56K Modem PCMCIA	139	163.32

## DABS

Combo ISA	9	10.57
Combo PCI	11	12.92
10/100 PCI	19	22.32
Combo PCMCIA	45	52.87

## DLINK

DE-220PCT Combo ISA	10	11.75
DE-528CT Combo PCI	15	17.62
DPE-530TX 10/100 PCI	25	29.37
DE-820CT Combo Parallel	65	76.37
DE-860CT Combo PCMCIA	39	45.82
DME-560CT Combo & 56K PCMCIA	149	175.07
DPE-650TX 10/100 PCMCIA	75	88.12
DPE-660TX 10/100 CardBus PCMCIA	85	99.87

## GENIUS

Combo ISA	15	17.62
Combo PCI	15	17.62
10/100 PCI	25	29.37
Pocket Parallel	45	52.87
Combo PCMCIA	45	52.87

## INTEL

Ether Express Pro 10+ Combo	65	76.37
Ether Express Pro 10+ Combo PCI	69	81.07
Ether Express Pro 100 ISA	99	116.32
Ether Express Pro 100+ PCI	45	52.87
Ether Express Pro 100 WOL PCI	55	64.62
Ether Express Pro 100 Mobile PCMCIA	89	104.57
Ether Express Pro 100 Mobile CardBus	95	111.62
Ether Exp Pro 100 & 56K Modem PCMCIA	195	229.12

## PSION DACOM

GoldCard Combo PCMCIA	89	104.57
GoldCard Combo & V34 Modem PCMCIA	159	186.82
NetGlobal PCMCIA	59	69.32
NetGlobal 10/100 PCMCIA	89	104.57
NetGlobal 10/100 CardBus	89	104.57
NetGlobal 10Mb & 56K Modem PCMCIA	169	198.57

## GDC/GREYCELL

GCS-2210 RJ45 PCMCIA	89	104.57
GCS-2220 Combo PCMCIA	105	123.75
10/100 CardBus	109	128.07
DF-3410 RJ45 & 33k6 Modem PCMCIA	149	175.07
DF-3412 Combo & 33k6 Modem PCMCIA	175	205.62

## SMC

1660BT EZ Card 10 Combo ISA	18	21.15
1208BT EZ Card 10 Combo ISA	18	21.15
8416BT EtherZ Combo ISA PhP	28	32.90
8432BT EtherPower Combo PCI	39	45.82
9432BT EtherPower II 10/100 PCI	44	51.70
8020T EtherZ RJ45 PCMCIA	69	81.07
8020BT EtherZ Combo PCMCIA	90	105.75

## XIRCOM

RJ45 PCMCIA (10/100 upgradeable)	76	89.30
Combo PCMCIA (10/100 upgradeable)	105	123.37
10/100 PCMCIA	89	104.57
CardBus Ethernet II 10/100	89	104.57
CardBus Ethernet 10/100 & 56K Modem	189	222.07
RJ45 & 33k6 Modem PCMCIA	165	193.87
Combo & 33k6 Modem PCMCIA	185	217.37
10/100 RJ45 & 56K Modem PCMCIA	189	222.07
10/100 Combo & 56K Modem PCMCIA	205	240.87
RealPort Ethernet 10/100 PCMCIA	89	104.57
RealPort CardBus Ethernet 10/100	89	104.57
RealPort RJ45 & 56K Modem PCMCIA	179	210.32
RealPort 10/100 & 56K Modem PCMCIA	207	243.22

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BackUPS 500Mi	69	81.07
BackUPS 650Mi	105	123.37
BackUPS Pro 280Si PnP	79	92.82
BackUPS Pro 420Si PnP	105	123.37
BackUPS Pro 650Si PnP	145	170.37
BackUPS Pro 1000i	229	351.32
BackUPS Pro 1400i	309	363.07
SmartUPS		
SmartUPS 420i & PowerChute	115	135.12
SmartUPS 620i & PowerChute	165	193.87
SmartUPS 700i & PowerChute	189	222.07
SmartUPS 1000i & PowerChute	265	311.37
SmartUPS 1400i & PowerChute	329	386.57
SmartUPS 2200i & PowerChute	575	675.62
SmartUPS 3000i & PowerChute	829	974.07
SmartUPS Extended Run		
SmartUPS 700i Extended Run	349	410.07
SmartUPS 1000i Extended Run	415	487.62
SmartUPS 2200i Extended Run	819	962.32
SmartUPS Rackmount		
SmartUPS 700i Rack Mount	299	351.32
SmartUPS 1000i Rack Mount	425	499.37
SmartUPS 1400i Rack Mount	505	593.37
SmartUPS 2200i Rack Mount	909	1068.07
SmartUPS 3000i Rack Mount	1049	1232.57
Matrix		
Matrix 3000VA	1529	1796.57
Matrix 5000VA	2099	2466.32
Accessories		
Control-UPS	169	198.57
PowerManager	49	57.57
Share-UPS	155	182.12
SmartSlot Call-UPS II	79	92.82
SmartSlot Interface Expander	69	81.07
SmartSlot Relay I/O Module	79	92.82
SmartSlot SNMP Adaptor	179	210.32
LIEBERT		
Powersure 250VA	85	99.87
Powersure 400VA	112	131.60
Powersure 600VA	165	193.87
Powersure Interactive 700VA	229	269.07
Powersure Interactive 1000VA	309	363.07
Powersure Interactive 1400VA	489	574.57

PRINTER SERVERS

<b>BAY NETGEAR</b>		
PS104 1 parallel & 4port RJ45 Hub	90	105.75
PS110 2 parallel & 1x10/100 RJ45	119	139.82
<b>OLINK</b>		
DP-100 2 parallel, 1 serial & Combo	89	104.57
DP-301 1 parallel & 1x 10/100 RJ45	85	99.87
DP-300 2 parallel, 1 serial & 10/100 RJ45	99	116.32
DP-602 10/100 Internet Server	89	104.57
DP-802 10/100 Multiple Server	99	116.32
<b>HP JETDIRECT</b>		
Internal		
J2550B JetDirect RJ45 MIO	205	240.87
J2552B JetDirect Combo & LocalTalk MIO	242	284.35
J2556B JetDirect 10/100 RJ45 MIO	264	310.20
J3110A JetDirect RJ45 EIO	181	212.67
J3111A JetDirect Combo & LocalTalk EIO	216	253.80
J3113A JetDirect 10/100 RJ45 EIO	232	272.60
External		
J2590A JetDirect Plus3 10/100	351	412.42
J2591A JetDirect Plus Combo	186	218.55
J2538A JetDirect 170X	96	112.80
J3263A JetDirect 300X 10/100	186	218.55
J3265A JetDirect 500X 10/100 3 parallel	220	258.50
<b>INTEL NETPORT EXPRESS</b>		
Pro MIO Combo	159	186.82
Pro Combo 2 parallel 1 serial	195	229.12
10/100 1 parallel	139	163.32
10/100 1 parallel 3 pack	415	487.62
Pro 100 2 parallel 1 serial	199	233.82
Pro 100 2 parallel 1 serial 3 pack	545	640.37

NETWORK REPEATERS

<b>DLINK</b>		
DE-802 BNC-AUI 2port	119	139.82
DE-803 BNC-AUI 3port	79	92.82
DE-804 BNC-AUI 4port	165	193.87
DE-805 BNC-AUI 5port	115	135.12
DE-855 BNC-RJ45 Media Converter	45	52.87

NETWORK TRANCEIVERS

<b>DLINK</b>		
DE-851 AUI-BNC	15	17.62
DE-852N AUI-AUI	39	45.82
DE-853 AUI-RJ45	15	17.62
DE-854 AUI-Fibre	69	81.07
DPE-855 AUI-Fibre10/100	149	175.07



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Product	Typical Runtime	Price
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Back-UPS 650Mi	5-54 min.	£105 (£123.37)
Back-UPS Pro 280Si	7-17 min.	£79 (£92.82)
Back-UPS Pro 420Si	5-18 min.	£105 (£123.37)
Back-UPS Pro 650Si	6-44 min.	£145 (£170.37)

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- User replaceable, hot-swappable batteries for 100% uptime
- Optional SmartSlot® accessories customize functionality of models 700VA and up

Runtime Product/VA	Capacity Half/Full Load	Price
<b>APC Smart-UPS</b>		
Smart-UPS 420	10/4 min.	£115 (£135.12)
Smart-UPS 620	14/6 min.	£165 (£193.87)
Smart-UPS 700	17/5 min.	£189 (£222.07)
Smart-UPS 1000	18/6 min.	£265 (£311.37)
Smart-UPS 1400	18/7 min.	£329 (£386.57)
Smart-UPS 2200	25/10 min.	£575 (£675.62)
Smart-UPS 3000	17/8 min.	£829 (£974.07)

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REM 56G-10T	RealPort 10 + Modem 56	£189	(£222.07 inc VAT)
REM 56G-100BTX	RealPort 10/100 + Modem 56	£209	(£245.57 inc VAT)
RBEM 56-100BTX	RealPort CardBus 10/100 + Modem 56	£219	(£257.32 inc VAT)

ETHERNET

RE-100BTX	RealPort 10/100	£85	(£99.87 inc VAT)
RBE-100BTX	RealPort CardBus 10/100	£89	(£104.57 inc VAT)

MODEM

RM56G	RealPort Modem 56 GlobalACCESS	£129	(£151.57 inc VAT)
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NETWORK SWITCHES

3COM	ex VAT	inc VAT
<b>Officeconnect</b>		
3C16731 140M 4x10Mb, 1x100Mb	295	346.62
3C16732 280 8x10Mb, 2x10/100Mb	299	351.32
3C16733 400 4x10/100Mb	245	287.87
<b>SuperStack II</b>		
3C16460 Switch 320 12port	355	417.12
3C16464 10/100 Switch 12port	645	757.67
3C16465 10/100 Switch 24port	889	1044.57
3C16902 Desktop Switch 24port	899	1056.32
3C16951 1100 12x10Mb, 2x10/100Mb	565	663.87
3C16950 1100 24x10Mb, 2x10/100Mb	820	963.50
3C16981 3300 12x10/100Mb	1095	1286.62
3C16980 3300 24x10/100Mb	1595	1874.12
3C39024 3900 24x10/100Mb	3110	3654.25
<b>BAY NETGEAR</b>		
SW108 Compact 8x10Mb	145	170.37
SW510 Rack 8x10Mb, 2x100Mb	219	257.32
SW518 Rack 16x10Mb, 2x100Mb	390	458.25
FS102 Compact 2x 10/100Mb	79	92.82
FS104 Compact 4x 10/100Mb	175	205.62
FS108 Compact 8x 10/100Mb	245	287.87
FS308 8x 10/100Mb Internal PSU	299	351.32
FS508 Rack 8x 10/100Mb	439	515.82
FS516 Rack 16x 10/100Mb	695	816.62
<b>DLINK</b>		
DES802 2x10/100Mb	105	123.37
DES805 4x10Mb, 1x10/100Mb	115	135.12
DES815 12x10Mb, 3x100Mb	239	280.82
DES818 16x10Mb, 2x10/100Mb	229	269.07
DES1004 4x10/100Mb	169	198.57
DES1008 8x10/100Mb	309	363.07
DES1012 12x10/100Mb	639	750.82
DES2208 8x10Mb, 2x10/100Mb	845	992.87
DES3216 16x10/100Mb Managed	805	945.87
<b>INTEL</b>		
Express 10 Switch 24x10Mb	1095	1286.62
Express 10/100 Switch 8x10/100Mb	1279	1502.82
Express 510T Switch 24x10/100Mb	1479	1737.82
Express 5501 Routing Switch 8port	1279	1502.82
<b>INTEL IN BUSINESS</b>		
SS10T8 8x10Mb	145	107.37
SS110T8 8x10Mb, 2x10/100Mb	195	229.12

NETWORK ROUTERS

3COM	ex VAT	inc VAT
<b>Officeconnect</b>		
3C410002 Remote 511S Data	259	304.32
3C410007 Remote 521S Data/Voice	295	346.62
3C410012 Remote 531S Data/Voice/WAN	420	493.50
<b>BAY NETGEAR</b>		
RT238 ISDN Voice/Data	185	217.37
RH348 ISDN Voice/Data & 4port Hub	225	264.37
RK356 56K V90 Router	185	217.37
<b>CISCO</b>		
CPA765 ISDN Data/Voice	365	428.87
CPA771 ISDN Data & 4port Hub	335	393.62
CPA775 ISDN Data/Voice & 4port Hub	419	492.32
CPA801 ISDN Data	429	504.07
CPA803 ISDN Data/Voice & 4port Hub	485	569.87
CPA1601 Ethernet Serial	815	957.62
CPA1603 Ethernet/ISDN	815	957.62
CPA1720	975	1145.82
<b>DLINK</b>		
DI-105 IP Data/Voice & 6port Hub	189	222.07
DI-300 10/100 IP	199	233.82
DI-300M 10/100 IP/IPX	279	327.82
<b>INTEL IN BUSINESS</b>		
Internet Station	245	287.87
<b>RAMP WEBRAMP</b>		
M3t	275	323.12
Entre ISDN Data/Voice & 4port Hub	349	410.07

USB

ENTREGA	ex VAT	inc VAT
<b>Hubs</b>		
4port USB Stackable	49	57.57
7port USB Stackable	79	92.82
4port Multifunction USB Hub	95	111.62
4port Ethernet USB Hub	79	92.82
<b>Cards</b>		
2port USB Card PCI	24	28.20
4port USB Card PCI	45	52.87
<b>Converters</b>		
USB-Parallel Converter Kit	33	38.77
USB-Serial Converter Kit	49	57.57
USB-Ethernet Converter Kit	49	57.57

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<b>IBM UltraStar</b>									
9ES DDRS-34560	00K3980	4.5	U	7.5	512	7200	5	138	162.15
9ES DDRS-34560	00K4000	4.5	WU	7.5	512	7200	5	135	158.62
9ES DDRS-34560	22L0221	4.5	WU2	7.5	512	7200	5	132	155.10
9ES DDRS-39130	00K3970	9.1	U	7.5	512	7200	5	249	292.57
9ES DDRS-39130	00K3990	9.1	WU	7.5	512	7200	5	246	289.05
9ES DDRS-39130	22L0211	9.1	WU2	7.5	512	7200	5	246	289.05
18ES DNES-318350	25L1910	9.0	UW2	7.5	2046	7200	5	354	415.95
18ES DNES-318351	25L1900	18.3	UW2	7.5	2046	7200	5	556	653.30
9LP DGHS-39110	59H6588	9.0	U	6.5	1024	7200	5	256	300.80
9LP DGHS-39110	59H6590	9.0	UW	6.5	1024	7200	5	256	300.80
9LP DGHS-39110	59H6818	9.0	UW2	6.5	1024	7200	5	256	300.80
9LZX	08L8260	9.1	WU2	6.3	4096	10020	5	370	434.75
18ZX	08L8258	18.2	WU2	6.3	4096	10020	5	632	742.60
18XP DGHS-318200	59H6589	18	U	7.5	1024	7200	5	468	549.90
18XP DGHS-318200	59H6591	18	WU	7.5	1024	7200	5	468	549.90
18XP DGHS-318200	59H6822	18	WU2	7.5	1024	7200	5	468	549.90
36XP	08L8404	36	WU2	7.5	1024	7200	5	978	1149.15
<b>QUANTUM</b>									
Viking II	QM304550PX-SW	4.5	WU	7.5	512	7200	5	160	188.00
Viking II	QM304550PX-LW	4.5	WU2	7.5	512	7200	5	160	188.00
Viking II	QM309100PX-SW	9.1	WU	7.5	512	7200	5	249	292.57
Viking II	QM309100PX-LW	9.1	WU2	7.5	512	7200	5	249	292.57
Atlas III	QM309100TD-S	9.1	U	7.8	1024	7200	5	277	325.47
Atlas III	QM309100TD-LW	9.1	WU2	7.8	1024	7200	5	277	325.47
Atlas III	QM318200TD-S	18.2	U	7.8	1024	7200	5	478	561.65
Atlas III	QM318200TD-LW	18.2	WU2	7.8	1024	7200	5	478	561.65
Atlas IV	9.1	U160m	5	10000	Call	Call	Call	Call	Call
Atlas IV	9.1	U160m	5	10000	Call	Call	Call	Call	Call
Atlas IV	36.4	U160m	5	10000	Call	Call	Call	Call	Call
Atlas 10k	9.1	7	7	7200	Call	Call	Call	Call	Call
Atlas 10k	18.2	7	7	7200	Call	Call	Call	Call	Call
Atlas 10k	36.4	7	7	7200	Call	Call	Call	Call	Call
<b>SEAGATE</b>									
Medalist Pro	ST34520N	4.5	U	9.5	512	7200	3	158	185.65
Medalist Pro	ST34520W	4.5	WU	9.5	512	7200	3	158	185.65
Medalist Pro	ST34520LW	4.5	WU2	9.5	512	7200	3	158	185.65
Medalist Pro	ST36530N	6.5	U	9.5	512	7200	3	215	252.62
Medalist Pro	ST36530W	6.5	WU	9.5	512	7200	3	215	252.62
Medalist Pro	ST39140N	9.1	U	9.5	512	7200	3	280	329.00
Medalist Pro	ST39140W	9.1	WU	9.5	512	7200	3	280	329.00
Medalist Pro	ST39140LW	9.1	WU2	9.5	512	7200	3	280	329.00
Barracuda 9LP	ST34573N	4.5	U	7.1	512	7200	5	265	311.37
Barracuda 9LP	ST34573W	4.5	WU	7.1	512	7200	5	265	311.37
Barracuda 9LP	ST34573WD	4.5	WD	7.1	512	7200	5	265	311.37
Barracuda 9LP	ST34573LW	4.5	WU2	7.1	1024	7200	5	265	311.37
Barracuda 9LP	ST34573FC	4.5	FC	7.1	1024	7200	5	293	344.27
Barracuda 9LP	ST39173N	9.1	U	7.1	512	7200	5	300	352.50
Barracuda 9LP	ST39173W	9.1	WU	7.1	512	7200	5	300	352.50
Barracuda 9LP	ST39173WD	9.1	WD	7.1	512	7200	5	300	352.50
Barracuda 9LP	ST39173LW	9.1	WU2	7.1	1024	7200	5	300	352.50
Barracuda 9LP	ST39173FC	9.1	FC	7.1	1024	7200	5	316	371.30
Barracuda 18	ST118273N	18.2	U	7.6	512	7200	5	582	683.85
Barracuda 18	ST118273W	18.2	WU	7.6	512	7200	5	582	683.85
Barracuda 18	ST118273WD	18.2	WD	7.6	512	7200	5	582	683.85
Barracuda 18	ST118273LW	18.2	WU2	7.6	1024	7200	5	582	683.85
Barracuda 18	ST118273FC	18.2	FC	7.6	1024	7200	5	604	709.70
Barracuda 18LP	ST39175LW	9.1	WU2	6.9	1024	7200	5	365	428.87
Barracuda 18LP	ST318275LW	18.2	WU2	6.9	1024	7200	5	Call	Call
Barracuda 18LP	ST318275FC	18.2	FC	6.9	1024	7200	5	Call	Call
Barracuda 36	ST136475LW	36.4	WU2	6.9	1024	7200	5	Call	Call
Barracuda 36	ST136475FC	36.4	FC	6.9	1024	7200	5	Call	Call
Barracuda 50	ST150176LW	50.1	WU2	6.9	1024	7200	5	Call	Call
Barracuda 50	ST150176FC	50.1	FC	6.9	1024	7200	5	Call	Call
Cheetah 9LP	ST34502LW	4.5	WU2	5.2	1024	10000	5	330	387.75
Cheetah 9LP	ST34502FC	4.5	FC	5.2	1024	10000	5	330	387.75
Cheetah 9LP	ST39102LW	9.1	WU2	5.2	1024	10000	5	432	507.60
Cheetah 9LP	ST39102FC	9.1	FC	5.2	1024	10000	5	471	553.42
Cheetah 18	ST118202LW	18.2	WU2	5.7	1024	10000	5	856	1005.80
Cheetah 18	ST118202FC	18.2	FC	5.7	1024	10000	5	878	1031.65
Cheetah 18LP	ST39103LW	9.1	WU2	6.9	1024	10000	5	Call	Call
Cheetah 18LP	ST39103FC	9.1	FC	6.9	1024	10000	5	Call	Call
Cheetah 18LP	ST318203LW	18.2	WU2	6.9	1024	10000	5	Call	Call
Cheetah 18LP	ST318203FC	18.2	FC	6.9	1024	10000	5	Call	Call
Cheetah 36	ST136403LW	36.4	WU2	7.4	1024	10000	5	Call	Call
Cheetah 36	ST136403FC	36.4	FC	7.4	1024	10000	5	Call	Call
<b>WESTERN DIGITAL</b>									
Enterprise 4550WDE4550-003	4.5	U	7.9	512	7200	5	245	287.87	
Enterprise 4550WDE4550-007	4.5	WU	7.9	512	7200	5	245	287.87	
Enterprise 4550WDE4550-0024	4.5	WU2	7.8	512	7200	5	257	301.97	
Enterprise 4550WDE4550-AV0030	4.5	WU2	7.8	4096	7200	5	276	324.30	
Enterprise 9100WDE9100-0003	9.1	U	7.9	512	7200	5	289	339.57	
Enterprise 9100WDE9100-0007	9.1	WU	7.9	512	7200	5	289	339.57	
Enterprise 9100WDE9100-AV0016	9.1	WU	7.9	1024	7200	5	296	347.80	
Enterprise 9100WDE9100-0024	9.1	WU2	7.8	512	7200	5	310	364.25	
Enterprise 9100WDE9100-AV0030	9.1	WU2	7.8	4096	7200	5	329	386.57	
Enterprise 18300WDE18300-0048	18.3	WU2	6.9	2056	7200	5	574	674.45	
Enterprise 18300WDE18300-AV0038	18.3	WU2	6.9	4096	7200	5	593	696.77	

U = Ultra, UW = Ultra Wide, WU2 = Wide Ultra 2

# HARD DISCS

## EIDE HARD DISCS

Model	Manufacturer Part Code	Capacity (Gb)	Interface	Access (ms)	Cache (Kb)	RPM	Warr (Years)	Exc Vat Price	Inc Vat Price
<b>FUJITSU</b>									
PicoBird	MPB/C 3032AT-UD	3.2	UDMA33	10	256	5400	3	73	85.77
PicoBird	MPB/C 3043AT-UD	4.3	UDMA33	10	256	5400	3	81	95.17
PicoBird	MPB/C 3064AT-UD	6.4	UDMA33	10	256	5400	3	88	103.40
PicoBird	MPB/C 3084AT-UD	8.4	UDMA33	10	256	5400	3	116	136.30
PicoBird	MPB/C 3102AT-UD	10.2	UDMA33	10	256	5400	3	127	149.22
<b>IBM UltraStar</b>									
Deskstar 166P	DTTA-350640	6.4	UDMA33	9.5	512	5400	3	97	113.97
Deskstar 166P	DTTA-350840	8.4	UDMA33	9.5	512	5400	3	101	118.67
Deskstar 166P	DTTA-351010	10.1	UDMA33	9.5	512	5400	3	115	135.12
Deskstar 166P	DTTA-351290	12.9	UDMA33	9.5	512	5400	3	146	171.55
Deskstar 166P	DTTA-351680	16.8	UDMA33	9.5	512	5400	3	181	212.67
Deskstar 256P	DJNA-352030	20.3	UDMA66	9	2048	5400	3	264	310.20
Deskstar 256P	DJNA-352500	25.0	UDMA66	9	2048	5400	3	330	387.75
Deskstar 256P	DTTA-371010	10.1	UDMA33	9.5	512	7200	3	142	166.85
Deskstar 14GXP	DTTA-371440	14.4	UDMA33	9.5	512	7200	3	204	239.70
Deskstar 22GXP	DJNA-371800	18.0	UDMA66	9	2048	7200	3	264	310.20
Deskstar 22GXP	DJNA-372200	22.0	UDMA66	9	2048	7200	3	330	387.75
<b>MAXTOR</b>									
DiamondMax 4320	90432D2	4.3	UDMA33	9	256	5400	3	78	91.65
DiamondMax 4320	90648D3	6.4	UDMA33	9	256	5400	3	88	103.40
DiamondMax 4320	90845D4	8.4	UDMA33	9	256	5400	3	97	113.97
DiamondMax 4320	91080D5	10.8	UDMA33	9	512	5400	3	115	135.12
DiamondMax 4320	91303D6	13.0	UDMA33	9	512	5400	3	145	170.37
DiamondMax 4320	91728D8	17.2	UDMA33	9	512	5400	3	195	229.12
DiamondMax Plus 2500	90750D6	7.5	UDMA33	9	512	7200	3	125	146.87
DiamondMax Plus 2500	91000D8	10.0	UDMA33	9	512	7200	3	147	172.72
<b>QUANTUM</b>									
Fireball EX	QM303200EX-A	3.2	UDMA33	9.5	512	5400	3	73	85.77
Fireball EX	QM305100EX-A	5.1	UDMA33	9.5	512	5400	3	88	103.40
Fireball EX	QM306400EX-A	6.4	UDMA33	9.5	512	5400	3	88	103.40
Fireball EX	QM310200EX-A	10.2	UDMA33	9.5	512	5400	3	129	151.57
Fireball EX	QM312700EX-A	12.7	UDMA33	9.5	512	5400	3	144	169.20
Fireball CR	QM304300CR-A	4.3	UDMA66	9.5	512	5400	3	Call	Call
Fireball CR	QM306400CR-A	6.4	UDMA66	9.5	512	5400	3	Call	Call
Fireball CR	QM308400CR-A	8.4	UDMA66	9.5	512	5400	3	Call	Call
Fireball CR	QM312700CR-A	12.7	UDMA66	9.5	512	5400	3	Call	Call
Fireball Plus KA		6.4	UDMA66	8.5	512	7200	3	Call	Call
Fireball Plus KA		9.1	UDMA66	8.5	512	7200	3	Call	Call
Fireball Plus KA		13.6	UDMA66	8.5	512	7200	3	Call	Call
Fireball Plus KA		18.2	UDMA66	8.5	512	7200	3	Call	Call
<b>SEAGATE</b>									
Medalist 4321	ST34321A	4.3	UDMA33	11	128	5400	3	82	96.35
Medalist 65									

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650Mb CD Recordable x 100 each	0.90	1.05
650Mb CD ReWritable x 10 each	10.50	12.33
650Mb CD ReWritable x 100 each	10.00	11.75

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2Gb/4Gb 90m DAT	3	3.52
4Gb/8Gb 120m DAT	8	8.81
12Gb/24Gb 125m DAT	19	22.32
Travan TR-1 400/800Mb	16	18.80
Travan TR-3 1.6/3.2Gb	22	25.85
Travan TR-4 4/8Gb	25	29.37
Iomega Ditto 2000 1/2Gb	14	16.45
Iomega Ditto 2000 1/2Gb 3pack	38	44.85
Iomega Ditto Max 3Gb	14	16.45
Iomega Ditto Max 5Gb	17	19.97
Iomega Ditto Max 7Gb	19	22.32
Iomega Ditto Max 10Gb	23	27.02

REMOVABLE CARTRIDGES	ex VAT	inc VAT
Iomega ZIP 100Mb	9	10.57
Iomega ZIP 100Mb 6 pack	40	47.00
Iomega JAZ 1Gb	59	69.32
Iomega JAZ 1Gb 3 pack	159	186.82
Iomega JAZ 2Gb	65	76.37
Iomega JAZ 2Gb 3 pack	159	186.82
LS-120 120Mb 3.5"	14	16.45
Panasonic 5.2Gb DVD-RAM	22	25.85
SyQuest SyJet 1.5Gb	51	59.92
SyQuest SparQ 1.0Gb	28	32.90
SyQuest SparQ 1.0Gb 3 pack	68	79.90
230Mb 3.5" MO	5	5.87
640Mb 3.5" MO	17	19.97
1.3Gb 5.25" MO	24	28.20
2.6Gb 5.25" MO	36	42.30

DATA SWITCHES

	ex VAT	inc VAT
2/1 Parallel Manual	10	11.75
4/1 Parallel Manual	15	17.62
2/2 Crossover Parallel Manual	29	34.07
2/1 Parallel Auto	19	22.32
4/1 Parallel Auto	29	34.07
8/1 Parallel Auto	99	116.32
2/1 VGA & keyboard	15	17.62
4/1 VGA & keyboard	25	29.37



The Medalist family of drives

Seagate continues to lead the market with high-capacity, high-performance Ultra ATA disc drives for midrange and high-end desktop PCs.

Model	Capacity	Interface	Access Time	Speed	Exc Vat	Inc Vat
ST34321A	4.3Gb	UDMA33	11ms	5400	£82	(£96.35)
ST36531A	6.5Gb	UDMA33	11ms	5400	£91	(£106.92)
ST38641A	8.6Gb	UDMA33	11ms	5400	£104	(£122.20)
ST10240A	10.2Gb	UDMA33	11ms	5400	£120	(£141.00)
ST33210A	3.2Gb	UDMA33	9.5ms	4500	£72	(£84.60)
ST36422A	6.4Gb	UDMA33	9.5ms	5400	£91	(£106.92)
ST38630A	8.6Gb	UDMA33	9.5ms	5400	£Call	(£Call)
ST310230A	10.2Gb	UDMA33	9.5ms	5400	£140	(£164.50)
ST313640A	13.6Gb	UDMA33	9.5ms	5400	£Call	(£Call)
ST34310A	4.3Gb	UDMA33	9ms	5400	£Call	(£Call)
ST38420A	8.4Gb	UDMA33	9ms	5400	£Call	(£Call)

Prices shown in brackets are inclusive of VAT

The Medalist family of drives are backed by a 3 year limited warranty

IBM hard disk drives

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Model	Capacity	Interface	Access Time	Speed	Exc Vat	Inc Vat
Deskstar 16GP	6.4Gb	UDMA33	9.5ms	5400	£97	(£113.97)
Deskstar 16GP	8.4Gb	UDMA33	9.5ms	5400	£101	(£118.67)
Deskstar 16GP	10.1Gb	UDMA33	9.5ms	5400	£115	(£135.12)
Deskstar 16GP	12.9Gb	UDMA33	9.5ms	5400	£146	(£171.55)
Deskstar 16GP	16.8Gb	UDMA33	9.5ms	5400	£181	(£212.67)
Deskstar 25GP	20.3Gb	UDMA66	9ms	5400	£264	(£310.20)
Deskstar 25GP	25.0Gb	UDMA66	9ms	5400	£330	(£387.75)
Deskstar 14GXP	10.1Gb	UDMA66	9.5ms	7200	£142	(£166.85)
Deskstar 14GXP	14.4Gb	UDMA66	9.5ms	7200	£204	(£239.70)
Deskstar 14GXP	10.1Gb	UDMA66	9.5ms	7200	£142	(£166.85)
Deskstar 22GXP	18.0Gb	UDMA66	9ms	7200	£264	(£310.20)
Deskstar 22GXP	22.0Gb	UDMA66	9ms	7200	£330	(£387.75)

CABLES

	ex VAT	inc VAT
Printer		
Parallel Printer 2m	4	4.70
Bi-Directional Parallel Printer 2m	5	5.87
Bi-Directional Parallel Printer 3m	7	8.22
Bi-Directional Parallel Printer 5m	9	10.57
C36M-C36M Centronics 2m	5	5.87
C36M-C36M Centronics 3m	7	8.22
C36M-C36M Centronics 5m	9	10.57
Macintosh Printer 2m	5	5.87
Serial		
D25-D25 Serial 2m	5	5.87
D25-D25 Serial 3m	7	8.22
D25-D25 Serial 5m	9	10.57
D9F/D25F-D25M Modem 2m	5	5.87
D9F/D25F-D25M Modem 5m	9	10.57
Ethernet		
RG58 (Thin) Ethernet 2m	4	4.70
RG58 (Thin) Ethernet 3m	5	5.87
RG58 (Thin) Ethernet 5m	7	8.22
RG58 (Thin) Ethernet 10m	10	11.75
RJ45 (Twisted Pair) Ethernet 2m	3	3.52
RJ45 (Twisted Pair) Ethernet 3m	5	5.87
RJ45 (Twisted Pair) Ethernet 5m	7	8.22
RJ45 (Twisted Pair) Ethernet 10m	10	11.75
Mains		
IEC Mains 2m	5	5.87
IDE		
IDE HD 140F-140F-140F Internal 1m	3	3.52
Floppy 134F-134F-34F Internal 1m	3	3.52
SCSI		
SCSI 150F-150F-150F Internal 1m	5	5.87
SCSI D25M-C50M 1m	6	7.05
SCSI D25M-HC50M 1m	10	11.75
SCSI C50M-C50M 1m	8	9.40
SCSI C50M-C50M 2m	12	14.10
SCSI HC50M-C50M 1m	10	11.75
SCSI HC50M-C50M 2m	12	14.10
SCSI HC50M-HC50M 1m	10	11.75
SCSI HC50M-HC50M 2m	18	21.15
WideSCSI HC68M-C50M 1m	15	17.62
WideSCSI HC68M-HC50M 1m	18	21.15
WideSCSI HC68M-HC68M 1m	20	23.50
Other		
USB 2m	5	5.87
Keyboard Extension DIN5M-DIN5F 2m	5	5.87
VGA Extension HD15M-HD15F 2m	5	5.87

REMOVABLE DRIVES & STREAMERS



REMOVABLE DRIVES

Brand	Capacity	Interface	Internal	inc vat	External	inc vat	
IOMEGA	Zip Red	SCSI	-	-	139	163.32	
	Zip Starter Kit	Parallel	-	-	109	128.07	
	Star Trek Starter Kit	Parallel	-	-	109	128.07	
	Zip	USB	-	-	85	116.32	
	Zip	EIDE	69	81.07	-	-	
	Zip	SCSI	79	92.82	79	92.82	
	Zip	Parallel	-	-	79	92.82	
	Jaz 2Gb	SCSI	249	292.57	249	292.57	
	AMACOM	Baby Zip	PCMCIA	-	-	169	198.57
		FlipDisk	PCMCIA	-	-	264	310.20
FlipDisk		PCMCIA	-	-	317	372.47	
FlipDisk		PCMCIA	-	-	384	451.20	
FlipDisk		PCMCIA	-	-	258	320.40	
PANASONIC	LS-120 bare	IDE	59	69.32	-	-	
	PD Drive	IDE	199	233.82	-	-	
	PD Drive	Parallel	-	-	259	304.32	
	PD Drive	SCSI	249	292.57	-	-	
	Zip JU811T	IDE	59	69.32	-	-	

BACKUP DEVICES

Brand	Capacity	Interface	Internal	inc vat	External	inc vat	Parallel	inc vat
FREECOM	DAT 81	SCSI	459	539.32	-	-	-	-
	DAT 241	SCSI	649	762.57	-	-	-	-
	DAT 8PS	SCSI/Parallel	-	-	529	621.57	529	621.57
	DAT 24ES	SCSI/Parallel	-	-	719	844.82	-	-
HEWLETT PACKARD	Colorado T3000	Floppy	92	108.10	-	-	-	-
	Colorado 5Gb	Floppy	114	133.95	-	-	144	169.20
	Colorado 8Gb	Floppy	140	164.50	-	-	168	197.40
	2/4Gb DAT Internal	SCSI	259	304.32	-	-	-	-
	SureStore 8	SCSI	485	569.87	555	652.12	-	-
	SureStore 24	SCSI	675	793.12	749	880.07	-	-
SureStore DLT40	SCSI	1902	2234.85	2105	2473.37	-	-	
SureStore DLT70	SCSI	-	-	4252	4996.10	-	-	
IDEMEGA	Ditto Max Pro	IDE	139	162.32	-	-	169	198.57
QUANTUM	DLT 4000	SCSI	1633	1918.77	1744	2049.20	-	-
	DLT 7000	SCSI	3622	4255.85	3733	4386.27	-	-
SEAGATE	Tapestor 8000I	IDE	154	180.95	-	-	-	-
	Tapestor 8000S	SCSI	176	206.80	264	310.20	-	-
SEAGATE DAT	STD24000N	SCSI	345	405.37	349	410.07	-	-
	STD28000N	SCSI	386	453.33	488	573.40	-	-
	STD22400N	SCSI	589	692.07	661	776.67	-	-
SONY	SDT-7000	SCSI	433	508.77	483	567.52	-	-
	SDT-9000	SCSI	564	662.70	615	722.62	-	-
	TSL-7000 Autoloader	SCSI	1167	1371.22	1312	1541.60	-	-

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- Uses genuine 250MB & 100MB Zip disks
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Zip 250Mb Drive **£139** (£163.32)  
Zip 250Mb SCSI **£139** (£163.32)

### 100Mb Zip Drive

The light weight Zip is 20 times as fast and offers 70 times the space of a traditional floppy. Ideal for mobile users Zip allows you to archive huge multimedia projects with ease.



Atapi Internal Drive **£69** (£81.07)  
Zip 100 Parallel Port External **£79** (£92.82)  
Zip 100 6 disk pack **£40** (£47.00)  
Zip 100 SCSI **£79** (£92.82)

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- Easy to connect
- Connect multiple USB devices
- Fast, unlimited capacity
- Mac & PC Compatible



Zip 100 USB External **£99** (£116.32)

### lomega Media

<b>Zip Drives</b>		<b>Ditto 3.7GB</b>	
Zip PC 100Mb Single	<b>£9</b> (£10.57)	Ditto 3.7GB Single	<b>£14</b> (£16.45)
Zip PC 100Mb 6 pack	<b>£40</b> (£47.00)	Ditto 3.7GB 3 pack	<b>£40</b> (£47.00)
Zip Mac 100Mb 6 pack	<b>£40</b> (£47.00)		
<b>Jaz Drives</b>		<b>Ditto Max Pro</b>	
Jaz PC 1GB Single	<b>£59</b> (£69.32)	Ditto Max 3GB Tape Single	<b>£14</b> (£16.45)
Jaz PC 1GB 3 pack	<b>£159</b> (£186.82)	Ditto Max 5GB Tape Single	<b>£17</b> (£19.97)
Jaz PC 2GB Single	<b>£65</b> (£76.37)	Ditto Max 7GB Tape Single	<b>£19</b> (£22.32)
Jaz PC 2GB 3 pack	<b>£159</b> (£186.82)	Ditto Max 10GB Tape Single	<b>£23</b> (£27.02)
Jaz Mac 1GB 3 pack	<b>£159</b> (£186.82)		
Jaz Mac 2GB 3 pack	<b>£159</b> (£186.82)		

STAR TREK



NOW INC. STAR TREK STARSHIP CREATOR GAME

6 Pack Multicolour Zip Disks **£40** (£47.00)

### The Zip Starter Kit

## Star Trek Starter Bundle

100Mb parallel Port Zip drive solution for PC Notebooks and Laptops. Includes drive, cable, power adaptor and one Zip starter disk with multi lingual ZIP tools. Plus six-pack of media, and Star Trek Starship Creator Game.




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### The Buz Multimedia

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# CD, DVD, CD-R, CD-RW DRIVES

## CD-ROM & DVD-ROM DRIVES

Model	Interface	Speed	Int/Ext	Exc Vat	Inc Vat
<b>AMACOM</b>					
EZCD x24	Parallel	Twenty Four	Ext	125	146.87
EZCD x32	Parallel	Thirty Two	Ext	135	158.62
EZCD Sound x24	Parallel	Twenty Four	Ext	170	199.75
EZCD Sound x32	Parallel	Thirty Two	Ext	180	211.50
EZCD Bravo x20	PCMCIA	Twenty	Ext	165	193.87
<b>AOPEN</b>					
CD936E 36	IDE	Thirty Six	Int	29	34.07
CD940E 40	IDE	Forty	Int	34	39.95
<b>ASUSTEK</b>					
CD-S340 34	IDE	Thirty Four	Int	35	41.12
CD-S400 40	IDE	Forty	Int	45	52.87
<b>COMPUTER CONNECTIONS</b>					
Connect 36 (12565)	Parallel/IDE	Thirty Six	Ext	112	131.60
Connect 36 (12566)	Parallel/SCSI	Thirty Six	Ext	135	158.62
Top CD 36 (12671)	Parallel/IDE	Thirty Six	Ext	89	104.57
<b>FREECOM</b>					
Freecom DVD-ROM (12658)	Parallel/PCMCIA	24x/2x	Ext	149	175.7
Traveller CD-ROM (12689)	PCMCIA 2	24x	Ext	129	151.57
Traveller DVD (12692)	PCMCIA 2	20x 2x	Ext	219	257.32
MPEG 2 Decoder (12647)	PCMCIA 2	n/a	for above	159	186.82
<b>CREATIVE LABS</b>					
CL 36x OEM	EIDE	Thirty Six	Int	24	28.20
36x Infra DEM	IDE	Thirty Six	Int	26	30.55
DiscoveryPCI 128 Kit	IDE	5x, 32x + SB128PCI + Spkrs	Int	70	82.25
PC DVD Encore 5x DXR2	IDE	5x, 32x + MPEG Card	Int	135	158.62
<b>LG</b>					
CRD-8320D	IDE	Thirty Two	Int	29	34.07
CRN-8240E	PCMCIA	Twenty Four	Ext	115	135.12
DRD-820B DVD-ROM	IDE	2x DVD, 24x CDROM	Int	77	90.47
<b>MITSUMI</b>					
FX-320	IDE	Thirty Two	Int	25	29.37
<b>PANASONIC</b>					
CR588	IDE	Thirty Two	Int	25	29.37
CR508	SCSI	Twenty Four	Int	55	64.62
LFD101 DVD-RAM	SCSI	1x DVD, 20x CDROM	Int	385	452.37
<b>PHILLIPS</b>					
PCA36XCD	IDE	Thirty Six	Int	31	36.42
PCA40XCD	IDE	Forty	Int	37	43.47
DVD-ROM	IDE	5x, 32x+ H/WPlusMPEG card	Int	Call	Call
<b>PIONEER</b>					
DR744	IDE	Thirty Six	Int	34	39.95
DR-706S Slot loading	SCSI	Thirty Six	Int	47	55.22
DR-704S Slot loading	IDE	Thirty Six	Int	39	45.82
<b>PLEXTOR</b>					
UltraPlex PX32CSI	SCSI	Thirty Two	Int	104	122.20
UltraPlex PX40TSI	SCSI	Forty	Int	77	90.47
UltraPlex PX40TSE	SCSI	Forty	Ext	120	141.00
<b>SAMSUNG</b>					
SCR-3230	IDE	Thirty Two	Int	25	29.37
<b>TEAC</b>					
CD-532E	IDE	Thirty Two	Int	28	32.90
CD-532S	SCSI	Thirty Two	Int	53	62.27
<b>TOSHIBA</b>					
XM6202B	IDE	Thirty Two	Int	31	36.42
XM6201B	SCSI	Thirty Two	Int	60	70.50

## CD RECORDABLE & CD REWRITEABLE

Model	Interface	Read/Write Speed	Int/Ext	Software Included	SCSI Card Included	Media	Ex VAT	Inc VAT
<b>COMPUTER CONNECTIONS</b>								
CDRW Satellite 12486	SCSI	6x 2 x 2x	Ext	Yes	No	2 CDR, 1 CDRW	209	245.57
CDRW Satellite 12550	SCSI	16x 4 x 4x	Ext	Yes	No	2 CDR, 1 CDRW	265	311.37
CDRW Connect 12718	SCSI	4x 4x 16x	Int	Yes	No	2 CDR, 1 CDRW	244	286.70
CDRW Connect 11625	Parallel/IDE	6x 2x 2x	Ext	Yes	N/a	2 CDR, 1 CDRW	209	245.57
CDRW Connect 11626	Parallel/SCSI	6x 2x 2x	Ext	Yes	No	2 CDR, 1 CDRW	199	233.82
CDRW Connect 12667	Parallel/SCSI	4x 4x 16x	Ext	Yes	No	2 CDR, 1 CDRW	299	351.32
<b>FREECOM</b>								
Freecom CD-RW 12661	Parallel/PCMCIA	6x 2x 2x	Ext	Yes	No	2 CDR, 1 CDRW	199	233.82
Freecom CD-RW 12659	Parallel/PCMCIA	20x 4x 4x	Ext	Yes	No	2 CDR, 1 CDRW	265	311.37
<b>HEWLETT PACKARD</b>								
Surestore 7200i CDRW	IDE	6x 2x 2x	Int	Yes	N/a	1 CDRW, 1 CDR	145	170.37
Surestore 7200e CDRW	Parallel	6x 2x 2x	Ext	Yes	No	1 CDRW, 1 CDR	233	273.77
Surestore 8100i CDRW	IDE	24x 4x 2x	Int	Yes	N/a	1 CDRW, 1 CDR	229	269.07
<b>LACIE</b>								
DCCYW6-GRL	SCSI	4x 4x 16x	Ext	Yes	No	1 CDRW	279	327.82
DCCDW2-Y2C	SCSI	2x 2x 6x	Ext	Yes	No	1 CDRW	199	233.82
DCCCR5-E2C	SCSI	12x 4x	Ext	Yes	No	1 CDR	199	233.82
<b>MITSUMI</b>								
CR4801TE	IDE	8x 4x	Int	Yes	N/a	3 CDR	139	163.36
CR4802TE	IDE	8x 4x 2x	Int	Yes	N/a	3 CDR	148	173.90
<b>PHILIPS</b>								
CDD-350	SCSI	6x 2x 2x	Int	Yes	No	1 CDRW	149	175.07
CDD-362	IDE	6x 2x 2x	Int	Yes	No	1 CDRW	149	175.07
CDD-363	Parallel	6x 2x 2x	Ext	Yes	No	1 CDRW	194	227.95
<b>PLEXTOR</b>								
PlexWriter PX-R412Ci	SCSI	12r4w	Int	Yes	No	1 CDR	178	209.15
PlexWriter PX-R412Ce	SCSI	12r4w	Ext	Yes	No	1 CDR	235	276.12
PlexWriter PX-R820Ti	SCSI	20r8w	Int	Yes	No	274	321.95	
PlexWriter PX-R820Tse	SCSI	20r8w	Ext	Yes	No	2 CDR	325	381.87
PlexWriter PX-W4220Ti	SCSI	20r 4r 8w	Int	Yes	No	1 CDR 1 CDRW	211	247.92
<b>RICOH</b>								
MP-6200S Bare	SCSI	6x 2x 2x	Int	Yes (Data)	No	No	175	205.62
MP-6200S Soft/Media	SCSI	6x 2x 2x	Int	Yes	No	1 CDRW, 5 CDR	185	217.37
MP-6200S Kit	SCSI	6x 2x 2x	Int	Yes	Yes	1 CDRW, 5 CDR	215	252.62
MP-6200S Bare	SCSI	6x 2x 2x	Ext	Yes (Data)	No	No	215	252.62
MP-6200S Soft/Media	SCSI	6x 2x 2x	Ext	Yes	No	1 CDRW, 5 CDR	255	299.62
MP-6200S Kit	SCSI	6x 2x 2x	Ext	Yes	Yes	1 CDRW, 1 CDR	280	329.00
MP7040A-DP Kit	IDE	20x 4x 4x	Ext	Yes	Yes	1 CDRW, 5 CDR	275	323.12
<b>TEAC</b>								
CDR-55S	SCSI	12r4w	Int	Yes (recording)	No	1 CDR	155	182.12
CDR-55SK	SCSI	12r4w	Int	Yes (recording)	No	1 CDR	167	196.22
CDR-56SKC	SCSI	12r4w	Int	Yes (recording)	PCI	1 CDR	221	259.67
<b>TRAXDATA</b>								
CDR4120ELPRO	SCSI	12x 4x	Int	Yes (recording)	No	2 x CDR	178	209.15
CDE4120ELPRO	SCSI	12x 4x	Ext	Yes (recording)	No	2 x CDR	211	247.92
CDRW2260PLUS	IDE	6x 2x 2x	Int	Yes (recording)	n/a	1 CDRW, 1 CDR	160	188.00
CDEW2260ELPLUS	IDE	6x 2x 2x	Ext	Yes	n/a	1 CDRW, 1 CDR	186	218.55
CDRW-2260ELPRO	SCSI	6x 2x 2x	Int	Yes	No	No	188	220.90
CDEW-2260ELPRO	SCSI	6x 2x 2x	Ext	Yes	No	No	212	249.10
CDRW-6240ELPRO	SCSI	24x 6x	Int	Yes	No	No	280	329.00
<b>YAMAHA</b>								
CDRW 4416E-VK Kit	IDE	16r 4w 4w	Int	Yes	n/a	1 CDRW, 1 CDR	215	252.62
CDRW 4416S Bare	SCSI	16x 4x 4x	Int	No	No	No	205	240.87
CDRW 4416S with S/W	SCSI	16x 4x 4x	Int	Yes	No	No	215	252.62
CDRW 4416S Kit	SCSI	16x 4x 4x	Int	Yes	Yes	No	237	278.47
CDRW 4416S with S/W	SCSI	16x 4x 4x	Ext	Yes	No	No	269	316.07
CDRW 4416S Kit	SCSI	16x 4x 4x	Ext	Yes	Yes	No	296	347.80

## CD MEDIA

DABS	ex VAT	inc VAT
650Mb CD Recordable x 1	1.00	1.17
650Mb CD Recordable x 10 each	0.90	1.05
650Mb CD Recordable x 100 each	0.80	0.94
650Mb CD ReWritable x 1	10	11.75
650Mb CD ReWritable x 10 each	8.50	9.98
650Mb CD ReWritable x 100 each	8	9.40

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#### Mitsumi CR 4801 TE

8x read, 4x write internal IDE CDRecorder £139 (€163.32 inc VAT)

This Plug and Play CD-Recorder supports all current CD-standards, reading at a speed of 1200 Kbytes per second and comes with a full 12 month warranty.

The drive comes with WinToGo 4.5 by CeQuadrat developed for Microsoft Windows 95 - including incremental Packet Writing software. The package includes: audio and data cables, a multi-language manual, three blank CD-R discs, screws, and the music software Magix Music Centre.

#### Mitsumi CR 4802 TE

8x read, 4x write, 2x re-write CDRW

£148 (€173.90 inc VAT)

#### Mitsumi FX320 32x CD-ROM Drive

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#### Mitsumi 105-key Serial/PS/2 Keyboard

£10 (€11.75 inc VAT)



### PLEXTOR

#### PX-R820Ti

(internal) £274 (€321.95 inc VAT)

#### PX-R820Ti

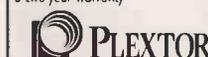
(external) £325 (€381.87 inc VAT)

#### PX-W4420Ti

(internal SCSI) £211 (€247.92 inc VAT)

The new Plector CD writer brings Plector's high standard of reliability and performance to CD-Recording. It writes data at an amazing eight speed, that's a full CD in about ten minutes! It can also read at up to 20 speed. A large 4Mb Buffer adds up to increase the speed and reliability of CD-writing. The Plector supports all Major Media and Formats.

All Plector CD ROM drives are backed up with a two-year warranty



### ULTRAPLEX 40MAX

The UltraPlex 40max offers improved performances over its previous generations. It features a Data Transfer rate between 2.6Mb - 6.0Mb and a fast random access time of 85ms for smooth multi-user and multi-tasking performances. In addition, the improved control of the 512Kb buffer enables faster transfer of large scaled data.

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- Running Optimum Power Control feature provides automatic control of write power during write operation to maximize error-free recording.



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• Play any CD-ROM. Record on CD-R media. Write or rewrite CD-RW discs  
• Includes Adaptec Easy CD Creator & Adaptec Direct CD software  
• Multiread compatible (able to read CDRW discs) • All drives support Digital Audio Extraction



PCA363RW	Parallel	External	£194	(£227.95 inc VAT)
PCA362RW	IDE	Internal	£149	(£175.07 inc VAT)
PCA350RW	SCSI	Internal	£149	(£175.07 inc VAT)

## CD-ROM

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• Multiread compatible (able to read CDRW discs) • All drives support Digital Audio Extraction



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650Mb CD-Recordable	£1.25 (£1.46)	2/4Gb 90m 4mm DAT	£3.00 (£3.52)
650Mb CD-ReWritable	£7.50 (£8.81)	4/8Gb 120m 4mm DAT	£7.50 (£8.81)
1.44Mb Floppy	£0.25 (£0.29)	12/24Gb 125m 4mm DAT	£19.00 (£22.32)
100Mb Zip	£7.50 (£8.81)	1.2Gb 54m 8mm DAT	£3.00 (£3.52)
230Mb MO	£4.65 (£5.46)	2.3Mb 112m 8mm DAT	£5.00 (£5.87)
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Description	Speed	Interface	Model	Ex Vat	Inc Vat
LaCie NEW Internal CD-RW	4x4x16x	inc. SCSI card	Internal*	£229	£269.07
LaCie NEW ext CD-RW	4x4x16x	inc. SCSI card	Silver*	£279	£327.82
LaCie NEW ext CD-R	4x12x	inc. SCSI card	d2*	£209	£245.57
LaCie NEW ext CD-R	8x20x	inc. SCSI card	d2*	£369	£433.57
LaCie NEW ext DVD-RAM	20x2x1x	inc. SCSI card	d2*	£459	£539.32
LaCie NEW ext CD (parallel)	36x	parallel	Silver	£85	£99.87
LaCie NEW ext CDRW Win 98	2x2x6x	USB	Silver	£229	£269.07

\* item includes SCSI card, audio cable and 1 blank media

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- DVD Traveller, 20X read (140ms) / 2X DVD optional MPEG-2 Decoder PC Card for '95/'98 and NT to run DVD movies.
- Size 7" X 5.5" X 0.8"



**Freecom**

	Price	inc VAT
12689 Freecom Traveller CD-ROM 24X	£129	£151.57
12805 PCMCIA Traveller DVD 2X/20X	£259	£304.32
12647 PCMCIA MPEG II controller	£159	£186.82
12545 Freecom IQ PCMCIA Cable	£30	£35.25
12544 Freecom IQ Parallel Cable	£23	£27.02
12775 Freecom IQ USB Cable	£32	£37.60



## Freecom

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- also available: CD-ROM 32X
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	Price	inc VAT
12661 Freecom CD-RW 2X/2X/6X	£199	£233.82
12659 Freecom CD-RW 4X/4X/20X	£265	£311.37
12658 Freecom DVD-ROM 2X/24X	£149	£175.07
12683 Freecom CD-ROM 32X	£79	£92.82
12545 Freecom IQ PCMCIA Cable	£30	£35.25
12544 Freecom IQ Parallel Cable	£23	£27.02
12671 Freecom IQ USB Cable	£32	£37.60

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- Speeds up to 2 MB per second.
- Internal SCSI, external SCSI and external Parallel/SCSI.

The INTERNAL DAT VALUE KIT includes: 5.25" bezel, installation manual, internal SCSI cable, 5 DAT tapes' cleaning cartridge and novastor backup software for DOS, Windows 3.x/95/98/NT4.0 and OS/2.



	Price	inc VAT
12662 Freecom DDS-2 DAT 4-8 GB	£459	£539.32
12663 Freecom DDS-3 DAT 12-24 GB	£639	£750.82

The EXTERNAL DAT VALUE KIT includes: installation manual, 5 DAT tapes', cleaning cartridge and NOVASTOR backup software for DOS, Windows 3.x/95/98/NT4.0 and OS/2.



	Price	inc VAT
12675 Freecom DDS-3 DAT 12-24 GB SCSI	£499	£586.32
12677 Freecom DDS-2 DAT 4-8 GB Parallel/SCSI	£679	£797.82

\* The DDS-3 12-24 GB includes 1 DAT tape

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	Price	inc VAT
12565 36X, External, Parallel	£112	£131.60
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12592 TOP CD 36X, External, Parallel	£89	£104.57



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- Reads all different CD formats.
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- Supplied with three media disks (two CD-R and one CD-RW).

## CONNECT

	Price	inc VAT
11626 2X/2X/6X Parallel	£199	£233.82
12667 4X/4X/16X Parallel & SCSI	£299	£351.32

## SATELLITE

	Price	inc VAT
12486 2X/2X/6X SCSI	£209	£245.57
12550 4X/4X/16X SCSI	£309	£363.07

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### HP DAT

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C1520H	HP Surestore Tape 2000e + media	£388	(£455.90 inc VAT)
C1526H	HP Surestore Tape 5000i + media	£330	(£387.75 inc VAT)
C1521H	HP Surestore Tape 5000e + media	£409	(£480.57 inc VAT)
92283B	Media 5 pack	£15	(£17.62 inc VAT)
C1536A	HP 2/4Gb Internal DAT Internal SCSI OEM	£259	(£304.32 inc VAT)
92283B	Media 5 pack	£15	(£17.62 inc VAT)
C1528H	HP Surestore DAT8i Internal 4/8Gb	£499	(£586.32 inc VAT)
C1529H	HP Surestore DAT8e External 4/8Gb	£590	(£693.25 inc VAT)
92300A	Media 5 pack	£35	(£41.12 inc VAT)
C1555B	HP Surestore DAT24i Internal 12/24Gb	£727	(£854.22 inc VAT)
C1556B	HP Surestore DAT24e External 12/24Gb	£805	(£945.87 inc VAT)
C1517A	Media 5 pack	£80	(£94 inc VAT)
C5648A	HP DAT24x6e 144Gb External Autoloader	£1628	(£1912.90 inc VAT)
C1559A	HP Surestore DAT 24x6e 144Gb External Autoloader + media	£1865	(£2191.37 inc VAT)

### HP SureStore T4i/e

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C5644C	Surestore T4i Internal SCSI+ media	£209	(£245.57 inc VAT)
C5645B	Surestore T4e External SCSI+ media	£264	(£310.20 inc VAT)
C4425A	Media TR4 Single	£24	(£28.20 inc VAT)

### HP Surestore DLT

High-performance backup for high-end servers

C5647A	HP DLT 40i 40Gb DLT Internal + media	£1902	(£2234.85 inc VAT)
C1579A	HP DLT 40e 40Gb DLT External + media	£2105	(£2473.37 inc VAT)
C5658A	HP DLT 70e 70Gb DLT External + media	£4252	(£4996.10 inc VAT)
C5141F	Media	£55	(£64.62 inc VAT)



### HP SureStore CD-Writer 7200i/e

Write, update and rewrite. Create CDs for CD ROM & audio players.

- Adaptec DirectCD and mastering software
- HP SimpleTrax software for file tracking/management
- DocuMagix PaperMaster Live acquire data from scanners, the WWW and store in 'filing cabinets' on CD
- Adobe Photo Deluxe for exciting photographic projects
- Corel Print/Ink Magic & Multimedia Content to make an impact with your presentations
- Adaptec's Audio CD for creating audio CD's
- Digital Now Photo Album for cataloguing pictures
- Includes Norton AntiVirus, for virus-free CD creation

HP SureStore CD-Writer 7200i	Internal EIDE	£145	(£170.37 inc VAT)
HP SureStore CD-Writer 7200e	External Parallel	£233	(£273.77 inc VAT)

### HP SureStore CD-Writer 8100i

- Fast Format of CD-RW in under 5 minutes
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- 4 speed write for CD-R, 2 speed write for CD-RW
- Up to 650MB, 74 minutes audio
- Software included: Adaptec DirectCD, Adaptec Easy CD Creator, HP Simple Trax, HP Disaster Recovery, HP Fast Format, Multimedia Tutorial and Install Assistant

HP SureStore CD-Writer 8100i	Internal EIDE	£229	(£269.07 inc VAT)
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Pentium 75, 90, 100, 120, 133, 150, 166 MHz	200 MHz	376	£89 (104.57)
	200 MHz	376 5-pack	£380** (446.50)
486 SX, SX2, DX, DX2	586/133 MHz	242	£69 (81.07)
	586/133 MHz	242 5-Pack	£300** (352.50)

\*System requirements of Windows 98: 486 DX2/66, 16 MB RAM memory. \*\*5-Pack includes 5 Upgrade Modules, 5 Install Disks (376) or 1 Utility Disk (242), 1 Installation Guide, 1 Removal Tool (242).

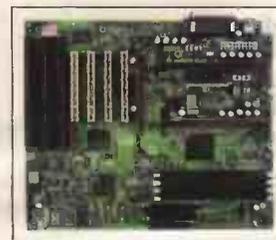
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- 1 ECP/EPP Parallel Port, 2 USB Conn., PS/2 Mouse & PS/2 Keyboard
- ACPI 1.0/PC 98 Ready
- PC Health Monitoring
- ATX Form Factor

- Intel 440BX Chipset
- Dual Pentium II 233-400MHz (66/100MHz CPU & DRAM Buses), (works with one or two CPUs)
- 4 DIMM Sockets
- 5 PCI/2 ISA/1 AGP slots
- 2Mb flash BIOS, Plug and Play, APM 1.2, DMI 2.01
- 2 Ultra DMA Bus Master with 33Mb/s burst data transfer rate, supports PI Mode 4, DMA Mode 2 and up to 4 IDE devices and LS-120 optical Floppy
- 1 ECP/EPP Parallel Port, 2 USB Conn., PS/2 Mouse & PS/2 Keyboard
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	Socket/Slot	SIMM, DIMM	PCI/ISA/AGP	Cache	Factor	(L) (H) (R)	(L) (H) (R)	(L) (H) (R)	(L) (H) (R)			
AH6	Intel LX	Slot 1	3	3/2/1	0k	ATX	N/A				44	51.70
LX6	Intel LX	Slot 1	4	4/3/1	0k	ATX	N/A				48	56.40
LM6	Intel LX	Slot 1	4	5/2/1	0k	ATX	N/A				49	57.57
BX6	Intel BX	Slot 1	4	5/2/1	0k	ATX	H				72	84.60
BH6	Intel BX	Slot 1	3	5/2/1	0k	ATX	H				62	72.85
BM6	Intel BX	Socket 370	3	3/2/1	0k	ATX	H				65	76.37
ZM6	Intel ZX	Socket 370	3	5/2/1	0k	ATX	H				60	70.50
<b>AOPEN</b>												
AX59 PRO	VIA MVP3	Super 7	3	4/2/1	1Mb	ATX	n/a				48	56.40
AX6B	Intel BX	Slot 1	4	4/3/1	0k	ATX	H				75	88.12
AX6BC	Intel BX	Slot 1	3	5/2/1	0k	ATX	H				67	78.72
AX6B+	Intel BX	2x Slot 1	4	4/3/1	0k	ATX	HS				130	152.75
MX6LS	Intel LX	Socket 370	3	3/1/1	0k	MATX	H			Call	Call	
AX6BV/AX63	VIA MBP 3	Slot 1	3	5/2/1	0k	ATX	H			Call	Call	
MX59 PRO	VIA MVP 4	Super 7	3	3/1/0	0k	MATX	HAV			Call	Call	
<b>ASUSTEK</b>												
P5A-B	Aladdin 5	Super 7	3	3/2/1	512k	AT	n/a				57	66.97
P5A-B / Audio	Aladdin 5	Super 7	3	3/2/1	512k	AT	A				60	70.50
P5A	Aladdin 5	Super 7	3	3/2/1	512k	ATX	n/a				60	70.50
P5A /Audio	Aladdin 5	Super 7	3	3/2/1	512k	ATX	A				67	78.72
P2B	Intel BX	Slot 1	3	4/3/1	0k	ATX	H				93	109.27
P2B-S	Intel BX	Slot 1	4	4/2/1	0k	ATX	HS				221	259.67
P2B-DS	Intel BX	2x Slot 1	4	4/2/1	0k	ATX	HS				316	371.30
P2B-LS	Intel BX	2x Slot 1	4	4/2/1	0k	ATX	HSL				250	293.75
<b>CHANTECH</b>												
5RS2A	Ali Aladdin 5	Super 7	2	2/2/1	512k	MATX	A				48	56.40
5AGM2	VIA MVP3	Super 7	3/0	3/3/1	512k	AT	n/a				43	50.52
6ESA	Intel EX	Slot 1	2	2/2/1	0k	MATX	HS				49	57.57
6BTM	Intel BX	Slot 1	4	4/3/1	0k	ATX	H				67	78.72
5BDU	Intel BX	2x Slot 1	4	4/2/1	0k	ATX	HS				260	305.50
<b>ELITE</b>												
P5VP-A+	VIA MVP3	Super 7	3	4/2/1	1Mb	ATX	H				50	58.75
P5SS-Me	SIS 530/5595	Super 7	2	3/1/0	2Mb	ATX	H/A/V				60	70.50
P6EXP-Me	Intel EX	Socket 370	3	3/1/1	0k	ATX	H/A				50	58.75

(A)Audio, (V)Video, (S)CSI, (L)LAN, (H)Hardware, (R)Raid Port

MOTHERBOARDS												
ELITE	Chipset		Memory		Slots		Form		(A) (V) (S)		Exc Vat	Inc Vat
	Socket/Slot	SIMM, DIMM	PCI/ISA/AGP	Cache	Factor	(L) (H) (R)	(L) (H) (R)	(L) (H) (R)	(L) (H) (R)			
P6SEP-Me	SIS 620/5595	Socket 370	3	3/1/0	0k	ATX	H/A/V				60	70.50
P6BA-A+	VIA MBP3	Slot 1	3	5/2/1	0k	ATX	H				55	64.62
P6BX-A+	Intel BX	Slot 1	3	5/2/1	0k	ATX	H				65	76.37
P6BX-Me	Intel BX	Slot 1	3	2/2/1	0k	ATX	H/A				70	82.25
<b>GIGABYTE</b>												
GA5AX	Ali Aladdin 5	Super 7	3/0	5/2/1	512k	ATX	n/a				46	54.05
GA686LX4	Intel LX	Slot 1	4/0	4/2/1	0k	ATX	H				57	66.97
GA686BXE	Intel BX	Slot 1	4/0	5/2/1	0k	ATX	H				94	110.45
GA6BC	Intel BX	Slot 1	3/0	4/3/1	0k	AX	H				104	122.20
GA6BXS	Intel BX	Slot 1	4/0	4/3/1	0k	ATX	HS				123	144.52
GA6BXDS	Intel BX	2x Slot 1	4/0	4/3/1	0k	ATX	HSR				163	191.52
<b>INTEL</b>												
SE440BX-ZNA	Intel BX	Slot 1	3/0	3/1/1	0k	ATX	H				78	91.65
SE440BX-2	Intel BX	Slot 1	3/0	3/1/2	0k	ATX	HA				87	102.22
BI440ZX	Intel ZX	Socket 370	2/0	2/1/1	0k	MATX	HA				71	83.42
MU440EX2X	Intel EX	Slot 1	2/0	2/2/0	0k	MATX	HAV				83	97.52
MS440GX	Intel GX	Slot 2	4/0	5/1/1	0k	ATX	HA				499	586.32
<b>MICROSTAR</b>												
MS-5169 100Mhz	Aladdin Ali M1531	3 DIMM	4/3/1	512k	ATX	n/a					45	52.87
<b>ODI</b>												
Brilliant 1S	Intel BX	Slot 1	3/0	4/3/1	0k	ATX	H				63	74.02
Brilliant 4	Intel BX	2x Slot 1	4/0	4/2/1	0k	ATX	HS				176	206.80
Brilliant 4+Lan	Intel BX	2x Slot 2	4/0	4/2/2	0k	ATX	HSL				192	226.60
Brilliant 5	Intel BX	Slot 1	3/0	3/1/1	0k	ATX	HS				65	76.37
Advance 3	VIA MVP3	Super 7	2/0	2/2/1	512k	ATX	n/a				39	45.82
Legend 9	Intel LX	Socket 370	3/0	4/3/1	0k	ATX	H				45	52.87
<b>SMICRO</b>												
P6-SVA	VIA MBP 3	Slot 1	3	4/3/1	0k	ATX	N/A				66	77.55
P6-SBA	Intel BX	Slot 1	3	4/3/1	0k	ATX	H				73	85.77
P6-SBU	Intel BX	Slot 1	4	4/3/1	0k	ATX	HS				235	276.12
P6-DBE	Intel BX	2x Slot 1	4	5/2/1	0k	ATX	H				155	182.12
P6-DBS	Intel BX	2x Slot 1	4	4/3/1	0k	ATX	H/S				309	363.07
P6-DGU	Intel GX	2x Slot 1	4	5/2/1	0k	ATX	H/S				345	405.37
S2-DGU	Intel GX	2x Slot 2	4	5/2/1	0k	ATX	H/S				425	499.37

(A)Audio, (V)Video, (S)CSI, (L)LAN, (H)Hardware, (R)Raid Port

PROCESSORS				
INTEL	Bus Speed	ex VAT	inc VAT	
Celeron™ 333 (128k cache) Slot 1	66Mhz	52	61.10	
Celeron™ 366 (128k cache) Slot 1	66Mhz	74	86.95	
Celeron™ 400 (128k cache) Slot 1	66Mhz	102	119.85	
Celeron™ 333 (128k cache) Slot 370	66Mhz	52	61.10	
Celeron™ 366 (128k cache) Slot 370	66Mhz	66	77.55	
Celeron™ 400 (128k cache) Slot 370	66Mhz	94	110.45	
Pentium® II 350MHz (512k cache)	100Mhz	128	150.40	
Pentium® II 350MHz SECC 2 (512k cache)	100Mhz	128	150.40	
Pentium® II 400MHz (512k cache)	100Mhz	219	257.32	
Pentium® II 450MHz (512k cache)	100Mhz	345	405.37	
Pentium® II Xeon 400MHz (512Kb) 2 Way	100Mhz	625	734.37	
Pentium® II Xeon 400MHz (512Kb) 2/4 Way	100Mhz	625	734.37	
Pentium® II Xeon 400MHz (1024Kb) 2 Way	100Mhz	1500	1762.50	
Pentium® II Xeon 400MHz (1024Kb) 2/4 Way	100Mhz	1500	1762.50	
Pentium® II Xeon 450MHz (512Kb) 2 Way	100Mhz	625	734.37	
Pentium® II Xeon 450MHz (512Kb) 2/4 Way	100Mhz	625	734.37	
Pentium® II Xeon 450MHz (1024Kb) 2/4 Way	100Mhz	1500	1762.50	
Pentium® II Xeon 450MHz (2056Kb) 2/4 Way	100Mhz	2800	3290.00	
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<b>AMD BOXED</b>				
K6-2® With 3D Now!™ 350Mhz	100Mhz	75	88.12	
K6-2® With 3D Now!™ 380Mhz	95Mhz	Call	Call	
K6-2® With 3D Now!™ 400Mhz	100Mhz	Call	Call	

PROCESSORS				
AMD OEM	Bus Speed	ex VAT	inc VAT	
K6-2® With 3D Now!™ 300Mhz	66Mhz	52	61.10	
K6-2® With 3D Now!™ 300Mhz	100Mhz	52	61.10	
K6-2® With 3D Now!™ 333Mhz	66Mhz	58	68.15	
K6-2® With 3D Now!™ 333Mhz	95Mhz	58	68.15	
K6-2® With 3D Now!™ 350Mhz	100Mhz	66	77.55	
K6-2® With 3D Now!™ 366Mhz	66Mhz	82	96.35	
K6-2® With 3D Now!™ 380Mhz*	95Mhz	90	105.75	
K6-2® With 3D Now!™ 400Mhz	100Mhz	108	126.90	
<b>CYRIX</b>				
MII 300™*	66Mhz	41	48.17	
MII 333™*	83Mhz	56	65.80	
<b>EVERGREEN</b>				
242 Single		69	81.07	
242 Five Pack		320	376.00	
MXPRO 200 Single		89	104.57	
MXPRO 200 Five Pack		380	446.50	
MXPRO 240 Single		109	128.07	
MXPRO 333 Single		169	198.57	
<b>IDT OEM</b>				
Whinchip 200MHz* MMX	66Mhz	25	29.37	
Whinchip 225MHz* MMX	75Mhz	29	34.07	
Whinchip 240MHz* MMX	60Mhz	32	37.60	
Whinchip 2 With 3D Now! 200Mhz	66Mhz	29	34.07	
Whinchip 2 With 3D Now! 225Mhz	75Mhz	33	38.77	
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105 key Windows 95 Click AT	42	49.35
105 key Windows 95 Click PS/2	42	49.35
<b>LEAF</b>		
105 key Windows 95	7	8.22
<b>LOGITECH</b>		
Cordless Keyboard & Mouse	59	69.32
<b>MICROSOFT</b>		
Natural Elite Windows 95	29	34.07
<b>MITSUMI</b>		
105 key Windows 95	9	10.57
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AHA-8945 Firewire/UltraSCSI kit PCI	345	405.37
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LCS-2420 20W	39	45.82
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Maxim 60 60W	15	17.62
Maxim 120 120W	25	29.37
Maxim 160 160W	29	34.07
Maxim 250 250W	39	45.82
Maxim 300 Woofer	49	57.57
Headphone & Microphone	6	7.05
<b>MICROSOFT</b>		
Digital Sound System 80 USB	115	135.12
<b>PHILIPS</b>		
MMS-110	11	12.92
MMS-130	15	17.62
MMS-250 Sub woofer	43	50.52
DSS-350 USB	89	104.57
DSS-370 & Sub woofer USB	119	139.82
SpeechMike	39	45.82
SpeechMike Pro	75	88.12
SpeechMike Pro Exec	219	257.32
<b>TEAC</b>		
PowerMax 1000ProLogic Set	135	158.62
<b>YAMAHA</b>		
YST-M15	35	41.12
YST-M20DSP 10W	42	49.35
YST-M25DSP 10W & 15W Sub woofer	55	64.62
<b>VIDEOLOGIC</b>		
Sirocco Speakers 100W RMS	169	198.57

## CREATIVE

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## SPEAKERS

### PCWorks™ CSW100™

Creative PCWorks CSW100 is a highly affordable amplified, subwoofer/satellite system that delivers true high performance sound for your PC games and multimedia software. Separate amplifiers for bass signals translate into loud sound without annoying distortion. The lowest cost three piece system in the range.



£39 (£45.82)

### SoundWorks™ CSW200™

Creative SoundWorks CSW200 is an amplified subwoofer/satellite multimedia system which delivers a truly brilliant, clear and realistic and audio experience when playing your favourite games (or Walkman, TV or small hi-fi system). It produces the natural, accurate, wide-range sound associated with high quality stereo systems, all at an affordable price.



£69 (£81.07)

### MicroWorks™ CSW350™

MicroWorks, the most powerful amplified speaker system for the PC, consists of a pair of compact satellite speakers and a powerful, amplified subwoofer that will rattle your windows and shake the floor while still maintaining exceptional tonal balance.



£115 (£135.12)

### PCWorks™ FourPointSurround™

Based on the award winning PCWorks CSW 100 speaker system, PCWorks FourPointSurround is the first speaker sound system to offer surround sound and 3D positional audio for 3D capable sound cards. It offers four discretely powered satellite speakers and a powered subwoofer for EAX and DirectSound 3D games and applications that support 4 channel output.



REAR SPEAKER STANDS INCLUDED

£45 (£52.87)

### SOUND CARDS

	ex VAT	inc VAT
<b>CREATIVE LABS</b>		
SoundBlaster 16 Value Non-IDE	18	21.15
SoundBlaster PCI 128	32	37.60
SoundBlaster PCI 128 FourPoint	79	120.12
SoundBlaster Live! Value PCI	49	57.57
SoundBlaster Live! PCI	102	119.85
<b>DIAMOND</b>		
Sonic Impact S90	24	28.20
Monster Sound MX 300	45	52.88
<b>EVOLUTION MIDI KEYBOARDS</b>		
MK7 37 mini keys	29	34.07
MK10 49 mini keys	49	57.57
MK149 49 full keys	89	104.57
MK161 61 full keys	145	170.37
<b>GUILLEMOT</b>		
MaxiSound 64 Dynamic	59	69.32
MaxiSound 64 PCI	185	217.37
<b>LEAF</b>		
16bit 32 Wavetable 3D Yamaha	12	14.10
<b>PINE</b>		
Schubert 3D Max	14	16.45
Schubert 3D Pro	16	18.80
Aureal PCI	32	37.60
<b>TERRATEC</b>		
Base 2 PCI	29	34.07
XLerate PCI	49	57.57
EW564S	119	139.82
EW564L	280	329.00
Digital Extension R	55	64.62
Digital Extension F	110	129.25
<b>TURTLE BEACH</b>		
Daytona PCI	35	41.12
Fiji	149	175.07
Fiji Digital	179	210.32
Malibu Surround 64	45	52.87
MultiSound Pinnacle	229	269.07
MultiSound Pinnacle Digital	269	316.07
Pinnacle Project Studio	309	363.07
<b>VIDEOLOGIC</b>		
SonicStorm Pro	35	41.12
<b>YAMAHA</b>		
WaveForce 192XG PCI	45	52.87
SW10002XG PCI	335	393.63

## CREATIVE

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Join the DVD revolution!

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- DynamicXtended Resolution technology
- Quality Digital Video (MPEG-2)
- Dolby Digital (AC-3) output
- TV Out
- Bundled games

£135 (£158.62)

Please see above for the New Creative Speaker Range

Prices shown in brackets are inclusive of VAT

### \*Sound Blaster Live!™

£102 (£119.85)

So Real it has to be Live!

Sound Blaster Live! is the best PCI solution for any audio application. It supports up to 4 speakers (upgradeable to 8 speaker support) with Environmental Audio for the most realistic surround you've ever heard. The EMU 10K1 sound processor has the equivalent processing power of a P166MMX. SoundBlaster Live! comes with an amazing software bundle including professional audio editing packages and Unreal Special Edition.

### \*Sound Blaster Live Value!™

£49 (£57.57)

Sound Blaster Live! Value

The Sound Blaster Live! Value card delivers superb PCI audio performance for mainstream PC users. Based on the powerful EMU10K1 processor, the Sound Blaster Live! Value has tremendous audio processing power which, unlike many other low cost PCI solutions, operates from the card using minimum CPU overhead. This means you get the maximum performance from your PC, with the best possible frame rates in your games, more bandwidth for 3D audio and multi-channel support for games titles.

### 3D Blaster™ Voodoo2

12Mb £72 (£84.60)

Break the speed limit! We dare you!

With its three processors running in parallel, 3DBlaster Voodoo2 delivers an awesome fill rate which leaves others standing. For performance, image quality and 3D gameplay, it's the fastest card on the planet.

### Graphics Blaster™ Riva TNT

£72 (£84.60)

Powered by nVidia's RIVA TNT chipset

Advanced AGP 2X, delivers world-class 3D acceleration and blistering 2D performance. Ultra-wide, high speed 128 bit memory architecture and Twin-Textel 3D pipeline. Loaded with 16mb of Synchronous Memory and a powerful 250MHz DAC for resolutions up to 1920X1200 and refresh rates up to 240Hz. Includes - Colorific and Scala MM200 presentation software - Forsaken & Incoming, 2 hot gaming titles, optimised for higher resolution and greater colour depth.

### 3D Blaster Banshee PCI

£69 (£81.07)

2D/3D graphics solution based on the 3DFX Interactive, Voodoo Banshee chipset

Features include 16mb of high performance SDRAM, a 250MHz DAC and a full 128 bit graphics engine. Includes 3 Deep, Colorific and Incoming. Enjoy the best graphics at an amazing price - You CANNOT beat this board for price/performance.

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**OEM 32Mb £109** (£128.07)  
**Retail 32Mb £136** (£159.80)

**ATI new XPERT 128 16Mb**

- 128-bit 3D graphics performance
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- Full support for Direct 3D & OpenGL for all your favourite graphics intensive 3D games and applications
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**OEM 16Mb £79** (£92.82)



**ATI All-in-Wonder Pro**

PC Guide BestBuy March 1998



- Incredible 3D acceleration • Powerful 2D graphics
- Advanced TV tuner functionality
- Bring video into your PC
- Connect TV to all-in-Wonder Pro
- Amazing video quality
- Full AGP 2X version available



**OEM AGP 8Mb £89** (£104.57)  
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**ATI XPERT 98**

PC Home September 1998



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- Powerful 2D graphics
- Full AGP 2X card
- Windows 98 ready
- Full support for ATI-TV, the add-on TV Tuner card



**OEM AGP 8Mb £35** (£41.12)  
**Retail AGP 8Mb SDRAM £41** (£48.17)

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Video Cards • Multimedia cards • Speakers

**Guillemot**

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- Ferocious Voodoo 2 compatible 3D processor, scorches up to 4 million triangles/sec and 100 million pixels/sec.
- Accelerates all Glide, Direct 3D, OpenGL and Direct X games, backwardly compatible with over 250 games developed for 3Dfx technology.
- A massive 16Mb SGRAM (significantly faster than SDRAM)
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- Compatible with Windows 95, 98 and NT 4.0

with Games (PCI/AGP) **£79** (£92.82 inc VAT)  
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**pace**

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3D Edge **£79** (£92.82 inc VAT)

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- Based on the new 3Dfx Voodoo Banshee™ chip
- 3D gaming & high-end 2D performance on one card
- Enhanced AGP connection
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**matrox**

14-in-one graphics solution for 2D, 3D and video

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- High performance 128-bit DualBus video card with full AGP 2x support.
- High quality MJPEG video editing hardware and easy-to-use video editing software (AVID CINEMA)
- Advanced 2D, 3D and software DVD video acceleration.
- Features new MGA-G200 graphics chip and 8 MB of high speed memory.
- Video conferencing and image editing

**NEW** PCI **£149** (£175.07) AGP **£149** (£175.07)

### Matrox Millennium G200

Uncompromising 2D, 3D & video performance for business

- High performance 128-bit DualBus graphics card with full AGP 2x support
- Advanced 2D, 3D and software DVD video acceleration (software DVD player NOT included)
- 8 MB of high speed memory upgradeable to 16 MB
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- Full 3D setup and rendering engine
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- Supports DirectSound, DirectSound 3D & SoundBlaster DOS games
- Plays 64 simultaneous h/w accelerated audio streams & midi voices
- Very low CPU usage - means faster gameplay
- PC98 compliant
- Includes JetAudio (complete PC audio control centre) plus Yamaha SoftSynth for high quality Midi

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Second Generation DVD MPEG2 decoder card for PC

- Stunning digital quality video image
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- TV output to watch movies or games on large-screen TV
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**NEW SIROCCO**  
Studio quality speaker system for the PC

- Delivers true high-end HiFi performance to the PC
- Designed using professional audio techniques
- Achieves 100W true RMS (delivers over 1000W PMPO)
- Three way fully active design (tweeter, mid-range and sub)
- Two satellite speakers, with bass/midrange & separate tweeter, a sub-woofer & active filter/power amps
- Complete reproduction of audio frequency range & ultra low distortion
- For use with PC, game consoles, CD, MiniDisc, TVs or DVD Players

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**DIAMOND MULTIMEDIA**

**Viper V550** **NEW**

- DVD and MPEG 2- Full screen flicker-free playback (AGP version only).
- Blistering 3D performance-With Direct3D and OpenGL ICD support.
- Experience Quake 2 running at 70 frames per second!
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- 16Mb of SDRAM and a 250Mhz RAMDAC- support resolutions up to 1900 x 1200 in True Colour.
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- Palm size for easy portability.
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- Powered by Aureal's Vortex-2 Audio Accelerator.
- Monstrous positional 3D Audio - A3D 2.0 & DirectSound 3D.
- Studio-Quality 320-Voice DLS Wavetable Synthesiser.
- Up to 4 speakers for phenomenal Gaming Experience.
- Includes DVD with complete Dolby Digital (AC-3) support.
- Features MP-3 Tools for revolutionary Digital Internet Audio.

MX300 **£45** (€52.87)

Stealth II G460 8 Mb **£42** (€49.35) Monster 3D II 12Mb **£85** (€99.87)  
Sonic Impact S90 **£25** (€29.37)

Prices shown in brackets are inclusive of VAT. Retail boxes shown for illustrative purposes only.

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## VideoLogic

VIDEO CARDS						
Memory/Type	Chipset	RAMDAC	Ex VAT	Inc VAT	Ex VAT	Inc VAT
<b>ATI</b>			<b>PCI</b>		<b>AGP</b>	
3Dxpert@Work OEM	4Mb SGRAM	Rage Pro	230Mhz	29 34.07	29 34.07	
3Dxpert@Work OEM	8Mb SGRAM	Rage Pro	230Mhz	39 45.82	39 48.82	
3Dxpert@Play OEM	4Mb SGRAM	Rage Pro	230Mhz	29 34.07	29 34.07	
3Dxpert@Play OEM	8Mb SGRAM	Rage Pro	230Mhz	39 45.82	39 45.82	
All In Wonder Pro OEM	8Mb SGRAM	Rage Pro	230Mhz	89 104.57	89 104.57	
Xpert98 AGP OEM	8Mb SDRAM	Rage Pro	250mMhz	-	35 41.12	
Xpert99 AGP OEM	8Mb SDRAM	Rage 128	-	-	55 64.62	
Xpert 128 OEM	16Mb SDRAM	Rage 128	-	-	79 92.82	
Rage Magnum OEM	32Mb SDRAM	Rage 128	-	-	99 116.32	
Rage Fury AGP OEM	32Mb SDRAM	Rage 128	-	-	109 128.07	
Xpert98 AGP	8Mb SDRAM	Rage Pro	-	-	41 48.17	
3Dxpert@Work	4Mb SGRAM	Rage Pro	730Mhz	54 63.45	65 76.37	
Rage Fury AGP	32Mb SDRAM	Rage 128	-	-	136 159.80	
All In Wonder Pro	8Mb SGRAM	Rage Pro	230Mhz	109 128.07	109 128.07	
<b>CREATIVE LABS</b>						
Graphics Blaster Extreme	SGRAM	3D Labs Peramedia 2	230Mhz	59 69.32	-	-
3D Blaster Voodoo II	12Mb EDO	3DFX Voodoo 2	-	72 84.60	-	-
3D Blaster Banshee	16Mb SDRAM	3DFX Banshee	250Mhz	69 81.07	-	-
Graphics Blaster RIVA TNT	16Mb SGRAM	Riva TNT	250Mhz	-	72 84.60	
<b>DIAMOND</b>						
Stealth G460 OEM	8Mb SDRAM	Intel 740	203Mhz	41 48.17	-	-
Viper V550 TV Out	16Mb	Riva TNT	250Mhz	99 116.32	87 102.22	
Viper V550 XL TV Out	16Mb	Riva TNT	250Mhz	-	87 102.22	
Monster 3D II	12Mb EDO	3DFX Voodoo 2	250Mhz	89 104.57	-	-
Monster Fusion Rp	16Mb	Banshee	250Mhz	85 99.87	75 88.12	
Speedstar A70 TV Out	8Mb SDRAM	SIS	200Mhz	-	33 38.77	
<b>GUILLEMOT</b>						
Maxigramer Phoenix	16Mb	Voodoo Banshee	-	79 98.82	79 98.82	
<b>LEAF</b>						
S3 Trio64V + 765	2Mb EDO	S3 Trio 64V+	135Mhz	13 15.27	-	-
S3 VIRGE DX64	4Mb EDO	S3 VIRGE DX64	-	18 21.15	-	-
3D AGP	-	-	-	-	15 17.62	
AGP	8Mb	Intel 740i	-	-	28 32.90	
Voodoo 2	12Mb	3DFX Voodoo 2	-	69 81.07	-	-
<b>MATROX</b>						
Millenium G200	8Mb SGRAM	G200	250Mhz	65 76.37	76 89.30	
Millenium G200 DEM	8Mb SGRAM	G200	250Mhz	-	66 77.55	
Mystique G200 OEM	8Mb	G200	230Mhz	-	73 85.77	
Mystique G200	8Mb	G200	230Mhz	-	76 89.30	
Marvel G200	8Mb	G200	230Mhz	130 152.75	135 158.62	
<b>PACE</b>						
Pace 3D Egde	16Mb	Voodoo Banshee	-	79 98.82	-	-
<b>STB</b>						
Velocity 128	4Mb SGRAM	Nvidia Riva 128	230Mhz	85 99.87	-	-
Blackmagic Voodoo 2	12Mb EDO	3DFX Voodoo 2	135Mhz	135 158.62	-	-
<b>TECHWORKS</b>						
Power 3DII	12Mb SGRAM	3DFX Voodoo 2	-	69 81.07	-	-

MULTIMEDIA CARDS						
Memory/Type	Chipset	RAMDAC	Ex VAT	Inc VAT	Ex VAT	Inc VAT
<b>VIDEOLOGIC</b>						
Grafixstar 410	2Mb EDO	S3 Trio 64V2	135Mhz	25 29.37	-	-
Grafixstar 560 Pro	4Mb EDO	Cirrus Logic Laguna	-	29 34.07	-	-
Grafixstar 600 Pro	2Mb MDRAM	Tseng Labs ET6000	135Mhz	48 56.40	-	-
Apocalypse 3Dx Value Pack	4Mb SDRAM	NEC Power VR2	-	34 39.95	-	-
Apocalypse 3Dx	4Mb SDRAM	NEC Power VR2	-	50 58.75	-	-
Apocalypse 5D	6Mb	ET6100 + Power VR2	-	54 63.45	-	-
Apocalypse 5D	8Mb	ET6100 + Power VR2	-	77 90.47	-	-
Apocalypse 5D Sonic	6Mb	ET6100 + Power VR2 +Sound	-	57 66.97	-	-
Apocalypse 5D Sonic	8Mb	ET6100 + Power VR2 +Sound	-	81 95.17	-	-
<b>ATI</b>						
TV Tuner					49	57.57
<b>AVERMEDIA</b>						
Joy TV					79	92.82
TV Phone 98					74	86.95
TV Capture					69	81.07
InterCam USB Plus					75	88.12
Averkey 300					175	205.62
<b>DABS</b>						
TV/Tuner Teletext PCI					49	57.57
<b>HAUPTMAN</b>						
Win TV Primio PCI					50	58.75
Win TV PCI Nicam					67	78.72
Win TV Radio PCI Nicam					79	92.82
Win TV Cinema Pro					199	233.82
Video Wizard					115	135.12
<b>MIRO</b>						
miroMedia PCTV PCI					47	55.22
Video Director Studio 400					160	188.00
miroVideo DC10+					169	198.57
miroVideo DC30					385	452.37
miroVideo DV300					499	586.32
miroVideo DC30 Plus					599	703.82
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Super PCTV With Video Camera					89	104.57
<b>PACE</b>						
TV Card					62	72.85
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<b>SIGMA</b>						
Hollywood Plus					99	116.32
<b>VIDEOLOGIC</b>						
Captivator PCI					48	56.40
Captivator PCI/VC					145	170.37
Captivator PCI/VC camera u/garde					100	117.50
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E771	CRT/TCO 95	17"/16"	0.27	1280 x 1024 @ 66Hz	£195	£229.12
GA655	CRT/TCO 95	15"/14"	0.27	1280 x 1024 @ 66Hz	£140	£164.50
GS771*	CRT/TCO 95	17"/16"	0.27	1280 x 1024 @ 66Hz	£220	£258.50
VPA145	LCD Viewpanel	14.5"	n/a	XGA @ 75Hz	£685	£804.87

\*short depth with SuperClear™ Screen

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- New Shortneck Technology

£299 (€351.32 inc VAT)



**447Xpro**

- 17" Trinitron 0.25mm CRT
- Up to 1600 x 1200 @ 76Hz
- On-Screen Menu with Navi™ key

£349 (€410.07 inc VAT)



**446XS**

- 19" High Contrast 0.25mm FST
- New Shortneck Technology
- Up to 1600 x 1200 @ 75Hz

£419 (€492.32 inc VAT)



**446XPro**

- 19" High Contrast 0.26mm FST
- Up to 1600 x 1200 @ 85Hz
- On-Screen Menu with Navi™ key

£449 (€527.57 inc VAT)



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- 0.21mm horizontal mask pitch



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**CM753ET**

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**CM812ET**

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- Flicker free at up to 1600 x 1200 @75Hz (CM811ET)
- 1600 x 1200 @85Hz (CM812ET)

**CM813ET**

£799 (€882.82)

**CM814ET**

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Super Space Saving 21" monitors

- 5 lens focusing for unbeatable focus
- 0.21mm horizontal mask pitch
- Flicker free at up to 1600 x 1200 @90Hz (CM813ET)
- 1600 x 1200 @100Hz (CM814ET)

**DT3141ET**

£999 (€1173.82)

- Ultra wide viewing angle of 160° horizontal & vertical
- Ultra low power consumption
- 16.19 million colours
- Resolution up to 1024 x 768

All prices in brackets are inclusive of VAT

Masters of Monitor Technology

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All 0870 calls charged at national rate

### MicroScan G Range

Designed for more demanding graphics professional. The MicroScan G range couples excellent graphics performance with superb functionality. MicroScan G Range comes with 3yr on site swap out warranty.

<p><b>MicroScan 5G</b></p> <ul style="list-style-type: none"> <li>• 17" FST, 0.26mm</li> <li>• 1600 x 1200 @75Hz</li> <li>• TCO'95 approval</li> </ul> <p><b>£255 (€299.62)</b></p>	<p><b>MicroScan 5GT</b></p> <ul style="list-style-type: none"> <li>• 17" Sony Trinitron CRT, 0.25mm</li> <li>• 1600 x 1200 @ 75Hz</li> <li>• TCO'95 approval</li> </ul> <p><b>£279 (€327.82)</b></p>	<p><b>MicroScan 6G</b></p> <ul style="list-style-type: none"> <li>• 21" FST, 0.28mm</li> <li>• 1600 x 1200 @75Hz</li> <li>• TCO'95 approval</li> </ul> <p><b>£549 (€645.07)</b></p>
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### MicroScan P Range

This range, targeted at the high intensity professional user, covers from 15" through to 19". All models feature a more advanced OSD for image adjustment. MicroScan P Range comes with 3yr on site swap out warranty.

<p><b>MicroScan 4P</b></p> <ul style="list-style-type: none"> <li>• 15" FST, 0.28mm</li> <li>• 1280 x 1024 @60Hz</li> <li>• Integral Mic., Speaker option</li> </ul> <p><b>£119 (€139.82)</b></p>	<p><b>MicroScan 5P+</b></p> <ul style="list-style-type: none"> <li>• 17" FST, 0.26mm</li> <li>• 1280 x 1024 @60Hz</li> <li>• Integral Mic., Speaker option</li> <li>• MPR II approval</li> </ul> <p><b>£189 (€222.07)</b></p>	<p><b>MicroScan 6P</b></p> <ul style="list-style-type: none"> <li>• 19" FST, 0.26mm</li> <li>• 1600 x 1200 @75Hz</li> <li>• TCO'95 approval</li> <li>• Integral Mic. and USB Hub, Speaker option</li> </ul> <p><b>£369 (€433.57)</b></p>
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### Provista Range

Aimed at the entry level of the market the ProVista range provide excellent performance at very aggressive pricing - the ideal monitor for the Small Office/Home Office. Provista Range comes with 3yr warranty, 2yrs on site, 1yr RTB.

<p><b>ProVista E33</b></p> <ul style="list-style-type: none"> <li>• 14" conv. 0.28mm</li> <li>• 1024 x 768 @ 60Hz</li> <li>• Digital Image Controls</li> </ul> <p><b>£95 (€111.62)</b></p>	<p><b>ProVista E44</b></p> <ul style="list-style-type: none"> <li>• 15" FST, 0.28mm</li> <li>• 1280 X 1024 @60Hz</li> <li>• Digital Image Controls</li> </ul> <p><b>£105 (€123.37)</b></p>
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Prices in brackets are inclusive of VAT

## LG MULTI-MEDIA RANGE

Nobody is further ahead in IT than LG. £1.5m is spent every day on R&D and £2bn is being invested in a manufacturing plant in Wales, ensuring LG Electronics' position as a leading player in a very exciting digital future.

Serious hardware for the digital age

**500LC**  
15.1" (15.1" viewable) screen

- Brilliant active matrix TFT display
- Genesis chip allows full SVGA/75Hz
- Wide viewing angle, 60° left and right
- Bright 200cd/m<sup>2</sup> display
- Multi sync support up to 1024x768 @ 75Hz

**£645 (€757.87)**

**SW77T5**  
17" (15.8" viewable) screen

- Ultra contrast tube ensures greater levels of contrast and colour purity
- Flicker-free up to 1024x768 HI (non interlaced) @ 85Hz
- 0.28mm Dot Pitch
- Digital controls with on screen display
- Made in the UK

**£180 (€211.50)**

**SW77M**  
17" (15.7" viewable) screen

- Integrated stereo amplifier with DOME stereo speakers
- Built in mic plus earphone jack
- Flicker-free up to 1024x768 HI (non-interlaced) @ 85Hz
- 0.28mm Dot Pitch

**£220 (€258.50)**

**SW795SC**  
17" (16" viewable) screen

- 100kHz ultra high resolution screen
- 0.26mm Dot Pitch
- Maximum Raster-free resolution of 1600x1200 @ 80Hz
- Digital controls with on-screen display
- TCO '95 approved /
- Made in the UK

**£275 (€323.12)**

**SW216SC**  
21" (20" viewable) screen

- 3D 95kHz FST
- Flicker-free 1600x1200 HI (non interlaced) @ 75Hz
- Digital controls with onscreen display
- 0.28mm Dot Pitch with Double Focus Circuitry

**£610 (€716.75)**

**SW571**  
15" (13.8" viewable) screen

- Multi sync support from 640x480 up to 1280x1024 HI
- Flicker-free up to 1024x768 HI (non interlaced) @ 85Hz
- 0.28mm Dot Pitch
- Digital controls with on screen display
- Made in the UK

**£105 (€123.37)**

All monitors come with a 3 year on-site, swap-out warranty. \*TCO '95 on all monitors except SW571.

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**NEW ProLite46 TSA4632HT** **£2099 (€2466.32)**

46cm (18") TFT Colour LCD Monitor + IPS

- High Brightness, High Contrast Flat Panel Liquid Crystal Display
- 90° Rotating screen (Landscape & Portrait viewable)
- 1280 x 1024 @ 75Hz display resolution
- Additional features include Speakers and USB Hub
- No geometric display distortion, misfocus or misconvergence
- Ultra Space saving, lightweight design

**S702GT** **£229 (€269.07)**

- Award winning 17" 0.28mm FST
- Up to 1600x1200 NI@75Hz
- All CE ergonomic safety and environmental approvals

**VM-Pro400** **£299 (€351.32)**

- 17" 0.25mm DiamondTron
- Up to 1600x1200 NI@75Hz
- On-Screen Display Menu
- All CE Ergonomic, safety and environmental approvals

**VM-502** **£669 (€786.07)**

- 21" 0.27mm Enhanced dp FST
- 1800x1440 @ 75Hz
- On-Screen Display Menu
- All CE Ergonomic, safety and environmental approvals

**VM-350** **£119 (€139.82)**

- 15" 0.28mm FST
- Up to 1024x768@85Hz
- Digital Control and On-Screen Display Menu
- Microfilter™ Technology

**VM-Pro502** **£669 (€786.07)**

- 21" 0.28mm AG DiamondTron
- 1800x1440 @ 75Hz
- On-Screen Display Menu
- All CE Ergonomic, safety and environmental approvals

**VM-Pro450** **£435 (€511.12)**

- 19" 0.25mm DiamondTron NF
- Up to 1800 x 1440 @80Hz
- 27-115KHz horizontal frequency
- All CE Ergonomic, safety and environmental approvals
- Plug & play compatible

All iiyama monitors are with a 3yr warranty, 1st yr On-Site, 2nd, 3rd RTB or upgrade to our VisionCare warranty, 3 yr On-Site

**MITSUBISHI ELECTRIC**

Display Products

**WHY MITSUBISHI?**

Mitsubishi offers a 3 year warranty (1st year on-site, 2nd & 3rd year return-to-base)

Buy a Mitsubishi DIAMONDTRON monitor for guaranteed 100% pure DIAMONDTRON

The DIAMONDTRON CRT takes Aperture Grille technology to new levels of excellence delivering more accurate, sharper images.

The **Diamond Scan 50** 15" FST (13.8" viewable) colour monitor is designed to provide you with years of reliable trouble-free operation. The Diamond Scan 50 is low on cost but big on quality. This TCO95 certified 15" monitor is the right choice for your professional computing needs.

**£129 (€151.57 inc VAT)**

The **Diamond Scan 70** 17" with its precise 0.28mm dot pitch combined with shadow mask tube and MICROFILTER™ technology eliminates blur to produce a clear, sharply defined image. For cost-performance, this TCO95 certified 17" model is the easiest way to get high quality images on your desktop.

**£195 (€229.12 inc VAT)**

The **Diamond Plus 72** 17" monitor has higher refresh rates with horizontal scanning frequencies of up to 86kHz (1280 x 1024 @ 80Hz) and new DIAMONDTRON™ tube with upgraded focus and convergence performance for sharp, clean images with minimal eye-strain.

**£315 (€370.12 inc VAT)**

NEW

The **Diamond Pro 900u** 19" DIAMONDTRON NF CRT gives you accurate, pixel-perfect image reproduction with none of the distortion inherent in typical flat CRT screens. When compared to conventional shadow-mask and aperture grille tubes, DIAMONDTRON™ NF brings you the following three dramatic improvements: **distortion-free image**, glare reduction and wider viewing angle. Features a short depth monitor casing with internal USB hub as standard.

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**MONITORS**

ADI	Tube Size	VA DP(mm)	Max Res	(Hz)	(V/Hz)	Rec Res	S	Safety	Exc	Inc VAT
ProVista E33	14" CRT	13.3 0.28	1024 x 768	30-54	50-100	800 x 600 85Hz		MPR II	95	111.62
ProVista E44	15" FST	13.8 0.28	1280 x 1024	30-69	50-100	1024 x 768 85Hz		MPR II	105	123.37
MicroScan 4P	15" FST	13.8 0.28	1280 x 1024	30-69	50-120	1024 x 768 85Hz		MPR II	119	139.82
MicroScan 5P+	17" FST	16 0.26	1280 x 1024	30-69	50-120	1024 x 768 85Hz		MPR II	189	222.07
MicroScan 5G	17" FST	16 0.26	1600 x 1200	30-95	50-160	1280 x 1024 85Hz		TC095	255	299.62
MicroScan 5GT	17" TT	16 0.25	1600 x 1200	30-95	50-160	1280 x 1024 85Hz		TC095	279	327.82
MicroScan 6P	19" FST	18 0.26	1600 x 1200	30-95	50-160	1600 x 1200 75Hz		TC095	369	433.57
MicroScan 6G	21" FST	20 0.28	1600 x 1200	30-95	50-160	1600 x 1200 75Hz		TC095	549	645.07

**BELINEA**

10 40 10	14" CRT	13.2 0.28	1024 x 768	30-54	50-120	640 x 480 85Hz		MPR II	84	98.70
10 20 10	15" FST	13.8 0.28	1024 x 768	30-54	50-120	800 x 600 85Hz		MPR II	95	111.63
10 50 35	15" FST	13.6 0.28	1280 x 1024	30-69	50-120	800 x 600 100Hz		MPR II	99	116.32
10 50 46	15" FST	13.8 0.28	1280 x 1024	30-70	50-120	800 x 600 100Hz		TC095	109	128.07
10 50 80	15" FST	13.8 0.27	1280 x 1024	30-70	50-120	800 x 600 100Hz Y		TC095	129	151.57
10 30 40	17" FST	15.9 0.26	1600 x 1200	30-86	50-150	1024 x 768 100Hz		TC095	179	210.32
10 70 15	17" FST	15.9 0.26	1600 x 1200	30-70	50-160	1024 x 768 85Hz		TC095	219	257.32
10 70 20	17" FST	15.6 0.28	1280 x 1024	30-70	50-120	1024 x 768 85Hz		TC095	159	186.82
10 70 35	17" FST	16 0.27	1600 x 1200	30-95	50-180	1024 x 768 100Hz		TC095	239	280.82
10 70 50	17" DT	15.9 0.25	1600 x 1200	30-95	50-160	1024 x 768 100Hz		TC095	258	304.32
10 70 60	17" FST	16 0.27	1280 x 1024	30-70	50-120	1024 x 768 85Hz Y		TC095	199	233.82
10 70 65	17" FST	16 0.26	1600 x 1200	30-95	50-160	1024 x 768 100Hz Y		TC095	239	280.82
10 60 20	19" FST	17.8 0.26	1600 x 1200	30-95	50-160	1280 x 1024 85Hz		TC095	299	351.32
10 80 50	21" FST	20 0.25	1600 x 1200	30-115	50-160	1600 x 1200 85Hz		TC095	539	633.32
10 80 15	21" FST	20 0.25	1600 x 1200	30-115	50-160	1600 x 1200 85Hz			639	750.83

**CTX**

1451E/ML400	14" CRT	13.2 0.28	1024 x 768	30-50	50-120	800 x 600 75Hz		MPR II	85	99.87
1555E/ML510	15" FST	13.8 0.28	1024 x 768	30-55	50-110	800 x 600 85Hz		MPR II	99	116.32
1569SE/VL500	15" FST	13.8 0.28	1280 x 1024	30-70	50-120	1024 x 768 85Hz		MPR II	105	123.37
1569ME/MS500	15" FST	13.8 0.28	1280 x 1024	30-70	50-120	1024 x 768 85Hz Y		MPR II	135	158.62
1569UA/PR500	15" TT	14 0.25	1280 x 1024	30-70	50-120	1024 x 768 85Hz		MPR II	150	176.25
1769SE/VL700	17" FST	15.7 0.28	1280 x 1024	30-70	50-120	1024 x 768 85Hz		MPR II	169	198.57
1769MS/MS700	17" FST	15.7 0.28	1280 x 1024	30-70	50-160	1024 x 768 85Hz Y		MPR II	240	282.00
1792SE/VL710	17" FST	15.7 0.26	1600 x 1200	30-92	50-160	1280 x 1024 85 Hz		TC095	235	276.12
VL710ST	17" S/CRT	15.7 0.26	1600 x 1200	30-95	50-160	1600 x 1200 95 Hz			265	311.37
1995UE/VL950T	19" CRT	18 0.26	1152 x 870	30-95	50-160	1600 x 1200 85 Hz		TC095	335	393.07
2085X/EX800	20" FST	18.7 0.28	1600 x 1200	30-85	50-120	1280 x 1024 80 Hz		TC092	549	645.07
2185XE	21" FST	20 0.26	1600 x 1200	30-85	50-120	1280 x 1024 85 Hz		TC092	681	800.17
2195Ue	21" CRT	20 0.26	1600 x 1200	30-95	50-160	1280 x 1024 95 Hz		TC092	736	864.80

**DAEWOO**

518x	15" FST	14 0.28	1280 x 768	30-69	50-120	800 x 600 75Hz		MPR II	89	104.57
1509B	15" FST	14 0.28	1280 x 1024	30-69	50-120	1024 x 768 75Hz Y		MPR II	109	128.07
1707B	17" FST	16.2 0.28	1280 x 1024	30-69	50-120	1024 x 768 85Hz		MPR II	159	186.82
1707B TC095	17" FST	16.2 0.28	1280 x 1024	30-69	50-120	1024 x 768 85Hz		TC095	189	222.07

**FORMAC**

ProNitron 17/200	17" FST	15.8 0.27	1280 x 1024	30-69	50-90	1152 x 870 70Hz		TC095	155	182.12
ProNitron 17/500	17" TT	16 0.25	1280 x 1024	30-70	50-120	1152 x 870 70Hz		TC095	239	280.82
ProNitron 17/600	17" DT		1600 x 1200					TC095	239	280.82
ProNitron 19/200	19" FST	17.8 0.26	1600 x 1200	30-70	50-120	1600 x 1200 80Hz		TC095	345	405.37
ProNitron 19/500	19" TT	18 0.25	1600 x 1200	30-94	48-160	1600 x 1200 75Hz		TC095	435	511.12
ProNitron 21/700	21" TT	19.8 0.25	1600 x 1280	30-107	48-160	1600 x 1200 85Hz		TC095	665	781.37
ProNitron 24/600	24" TT	21.7 0.27	1920 x 1280	30-69	50-90	1920 x 1080 75Hz		TC095	1054	1238.45

**HITACHI**

CM640ET	17" FST	15.9 0.21	1152 x 870	31-69	47-130	1152 x 870 75Hz		TC095	199	233.82
CM641ET	17" FST	15.9 0.21	1600 x 1200	31-95	50-130	1600 x 1200 85Hz		TC095	289	339.57
CM752ET	19" FST	18 0.21	1280 x 1024	31-94	50-130	1280 x 1024 90Hz		TC095	389	457.07
CM761ET	19" FST								399	468.83
CM753ET	19" SFST	18 0.22	1600 x 1200			1600 x 1200 85Hz		TC095	489	574.57
CM811ET	21" FST	20 0.21	1600 x 1200	31-100	50-160	1600 x 1200 75Hz		TC095	619	727.32
CM812ET	21" FST	20 0.21	1800 x 1440	31-115	50-160	1600 x 1200 85Hz		TC095	699	821.32
CM813ET	21" FST	20 0.21	1800 x 1440	31-115	50-160	1600 x 1200 90Hz		TC095	799	938.82
CM814ET	21" FST	20 0.21	1800 x 1440	31-115	50-160	1600 x 1200 100Hz		TC095	949	1135.07

**IYAMA**

VM-350	15" FST	13.8 0.29	1280 x 1024	27-69	50-160	800 x 600 100Hz		MPR II	119	139.82
S702GT	17" FST	15.7 0.28	1600 x 1200	27-96	50-160	1600 x 1200 75Hz		TC095	229	269.07
VM-400	17" FST	15.7 0.26	1600 x 1200	27-96	50-160	1600 x 1200 75Hz		TC095	259	304.32
VM-17ES	17" FST	15.7 0.26	1600 x 1200	27-86	50-160	1152 x 864 85Hz Y		MPR II	249	410.07
VM-Pro400	17" DT	16 0.25	1600 x 1200	27-96	50-160	1152 x 864 85Hz		TC095	299	351.32
VM-450	19" FST	18 0.26	1600 x 1200	27-102	50-160	1280 x 1024 100Hz		TC095	399	468.82
VM-Pro450	19" NFDT	18 0.25	1800 x 1440	27-115	50-160	1600 x 1200 90Hz		TC095	435	511.12
VM-501	21" FST	20 0.27	1600 x 1200	27-96	50-160	1280 x 1024 85Hz		TC095	645	757.87
VM-Pro501	21" DT	20 0.28	1600 x 1200	27-96	50-160	1280 x 1024 85Hz		TC095	645	757.87
VM-502	21" FST	20 0.27	1800 x 1440	27-110	50-160	1600 x 1200 80Hz		TC095	669	786.07
VM-Pro502	21" DT	20 0.28	1800 x 1440	27-110	50-160	1600 x 1200 80Hz		TC095	669	786.07

**MONITORS CONTINUED**

IYAMA	Tube Size	VA DP(mm)	Max Res	(Hz)	(V/Hz)	Rec Res	S	Safety	Exc	Inc VAT
TS15G 15" Touch	15" FST	13.8 0.28	1280 x 1024	27-69	50-160	800 x 600 100Hz		MPR II	535	628.62
TS17T 17" Touch	17" FST	15.7 0.26	1600 x 1200	27-86	50-160	1024 x 768 75Hz		TC095	685	804.87
TS21T 21" Touch	21" DT	19.5 0.28	1800 x 1440	27-110	50-160	1024 x 768 75Hz		TC095	1185	1392.37

**MITSUBISHI**

DiamondScan 50	15" FST	14 0.28	1280 x 1024			1024 x 768 85Hz		TC095	129	151.58
DiamondScan 70	17" FST	16 0.25	1280 x 1024	30-70	50-180	1024 x 768 85Hz		TC095	195	229.12
DiamondPlus 71	17" DT	16 0.25	1280 x 1024	30-69	55-125	1024 x 768 85Hz		TC092	265	311.37
DiamondPlus 72	17" DT	16 0.25	1280 x 1024	30-95	50-152	1024 x 768 75Hz		TC095	315	370.12
DiamondPro 700	17" DT	16 0.25	1600 x 1200			1600 x 1200 75Hz		TC095	385	452.37
DiamondScan 90	19" FST	18 0.25	1600 x 1280			1600 x 1280 70Hz		TC095	385	452.37
DiamondPro 900U	21" DT	18 0.28	1600 x 1280	30-95	50-152	1600 x 1280 70Hz		TC095	435	511.12
DiamondPro 91TXM	21" DT	20 0.28	1600 x 1280	30-95	50-152	1600 x 1280 70Hz		TC095	675	793.12
DiamondPro +100E	21" DT	20 0.28	1600 x 1200			1600 x 1200 85Hz		TC095	695	816.62
DiamondPro 1010E	21" DT	20 0.26	1800 x 1440	30-115	50-152	1800 x 1440 76Hz		TC095	845	992.87

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## Monitors



ProNiton

### ProNiton Multisync 17/500

17" Trinitron monitor ideal for the professional user who wants quality at a competitive price.

- Low Emission TCO92
- Power Saving Mode
- Enhanced Multiscan
- Plug and play Windows 95
- CRT 0.25mm Super Fine Dot Pitch Trinitron Tube
- 30-85 kHz Horizontal Frequency
- 328mm x 242mm Viewable Area
- 1024 x 768 @ 85Hz Rec. Resolution

**£239**  
(£280.82)

### ProNiton Multisync 19/500

New 19" Sony Trinitron monitor ideal for multimedia and high-end graphics.

- TCO95 for an Ergonomic working environment
- Plug and Play Windows 95
- CRT Super Fine Dot Pitch Trinitron Tube
- 0.25-0.27mm Aperture Grille
- 30-94KHz Horizontal Frequency
- 480mm Diagonal
- 1600 x 1200 @ 75Hz Maximum Resolution

**£435**  
(£511.12)

### ProNiton Multisync 21/700

New 21" Sony Trinitron monitor for the serious professional user.

- TCO95 for an Ergonomic working environment
- Plug and Play Windows 95
- CRT Super Fine Pitch Trinitron Tube
- 0.25-0.27mm Aperture Grille Pitch
- 30-107 kHz Horizontal Frequency
- 404 x 302mm Viewable Area
- 504mm Diagonal
- 1600 x 1280 @ 80 Hz Maximum Resolution

**£665**  
(£781.37)

*Prices in brackets are inclusive of VAT*

CTX



**1555E/VL510** **£99**

CRT Size/Viewable **15"/13.8"** (£116.32 inc VAT)  
Dot Pitch (mm) **0.28mm**  
CRT Type **FST**  
Max. Resolution **1024 x 768 @ 70Hz**  
Rec. Resolution **800 x 600 @ 90Hz**  
Special Features **CE, MPRII**

CTX



**1769SE/VL700** **£169**

CRT Size/Viewable **17"/15.7"** (£198.57 inc VAT)  
Dot Pitch (mm) **0.28mm**  
CRT Type **FST**  
Max. Resolution **1280 x 1024 @ 65Hz**  
Rec. Resolution **1024 x 768 @ 90Hz**  
Special Features **CE, MPRII**

CTX



**1795UAT/PR711T** **£279**

CRT Size/Viewable **17"/16"** (£327.83 inc VAT)  
Dot Pitch (mm) **0.25mm**  
CRT Type **Trinitron\***  
Max. Resolution **1600 x 1200 @ 75Hz**  
Rec. Resolution **1280 x 1024 @ 85Hz**  
Special Features **MPRII, CE, TCO 95**

CTX



**1995UED/ML950T** **£335**

CRT Size/Viewable **19"/18"** (£393.63 inc VAT)  
Dot Pitch (mm) **0.26mm**  
CRT Type **High Contrast FST**  
Max. Resolution **1600 x 1200 @ 75Hz**  
Rec. Resolution **1280 x 1024 @ 90Hz**  
Special Features **MPRII, CE, TCO 95**

CTX Executive Exchange Service



A 3 year on site warranty for all CTX CRT monitors.

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## Belnea



**Belnea 10 20 10**  
• 15" FST 0.28mm  
• up to 1240 x 768 NI  
• 800 x 600 @ 85Hz  
• On-Screen Display  
• MPRII Compliant  
**£95** (£111.62)



**Belnea 10 40 10**  
• 14" 0.28mm  
• up to 1024 x 768 NI  
• 640 x 480 @ 85Hz  
• Digital Front Panel  
• MPRII Compliant  
**£84** (£98.70)



**Belnea 10 50**  
• 15" FST 0.28mm  
• up to 1280 x 1024 NI  
• 800 x 600 @ 85Hz  
• Digital Electronics  
• MPRII Compliant  
**£99** (£116.32)



**Belnea 10 70 20**  
• 17" FST 0.28mm  
• up to 1280 x 1024 NI  
• 1024 x 768 @ 85Hz  
• On-Screen Display  
• TCO 95  
**£159** (£186.82)



**Belnea 10 70 50**  
• 17" FST 0.25mm  
• DiamondTron CRT  
• up to 1600 x 1200 NI  
• 1024 x 768 @ 100Hz  
• On-Screen Display • TCO 95  
**£239** (£280.82)



**Belnea 10 60 20**  
• 19" FST 0.26mm  
• up to 1600 x 1200 NI  
• 1280 x 1024 @ 88Hz  
• Professional On-Screen Display  
• TCO 95  
**£299** (£351.32)



**Belnea 10 80 50**  
• 21" FST 0.26mm  
• up to 1600 x 1200 NI  
• 1600 x 1200 @ 75Hz  
• On-Screen Display  
• TCO 95  
**£539** (£633.32)

*All monitors include 3 years on-site exchange warranty (except for model 104010 which includes 3 years warranty with first year on site exchange)*

*Prices shown in brackets are inclusive of VAT*

## Two NEW Xtra Space Monitors from Philips

NEW

### 107B 17" Xtra Space Design Monitor



- 17"(16"VIS) monitor with depth of a 14" monitor
- 0.26mm Dot pitch
- 30 - 86 KHZ
- Recommended resolution : 1024 x 768 @ 85Hz
- Digital control with OSD plus Customax via USB
- TCO '99
- Dimensions: 411 x 49 x 380mm (W x H x D)
- Weight: 16.4kg
- MTBF: 75000 hours(excl CRT)

Call

NEW

### 109B 19" Xtra Space Design Monitor



- 19"(18"VIS) monitor with depth of a 17" monitor
- 0.26mm Dot pitch
- 30 - 95 KHZ
- Recommended resolution : 1280 x 1024 @85Hz
- Digital control with OSD plus Customax via USB
- TCO '99
- Dimensions: 452 x 463 x 420mm(W x H x D)
- Weight: 20.9kg
- MTBF: 75000 hours(excl CRT)

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**hp HEWLETT PACKARD**  
Expanding Possibilities

## HP ScanJet 6200c

Professional Series



£237  
(£278.47 inc VAT)

## HP ScanJet 6250c

Professional Series

The versatile consultant for fast, high-quality scanning with network capabilities for workgroups. Plus automatic multi-page feeder for higher productivity (HP ScanJet 6250c only)

- Superior Image Quality (1200 dpi HSI)
- Scans B&W linear for editing or enlargement with no loss of quality
- Unlimited enhanced resolution for quality image capturing
- Increase your productivity up to 4 times over comparable scanners
- Optimizes individual elements on the page (Automatic Page Analysis)
- Drag and drop scanned text or photos into applications

- Networkable scanner for high workgroup productivity
- Great flexibility (Advanced Imaging Controls) and faster scanning
- SCSI or USB interface (SCSI Card not included)

HP ScanJet 6200c with 3 Years OSM Warranty £303  
(£356.02 inc VAT)

HP ScanJet 6250c with 3 Years OSM Warranty £341  
(£400.67 inc VAT)

## HP ScanJet 3200c

£63 (€74.02 inc VAT)

The smart friend that helps you express your creativity.

- Excellent image quality - 600 dpi, 32-bit colour
- Full-page / A4 bond
- Passthrough parallel interface
- Windows 95, Windows 98 compatibility
- Software - HP PrecisionScan Lite with integrated OCR, Adobe PhotoDeluxe 2



HP ScanJet 3200c with 3 Years OSM Warranty

Call (€Call inc VAT)

## HP ScanJet 5200c

£156 (€183.30 inc VAT)

The efficient partner for quality results

- Excellent image quality 600dpi optical (1200 dpi HSI)
- Unique e-mail and web task guides
- Flexible OCR (recognises other languages)
- Parallel / USB interface



HP ScanJet 5200c with 3 Years OSM Warranty

£215 (€252.62 inc VAT)

## HP ScanJet 4200c

£117 (€137.47 inc VAT)

- USB, 600 x 1200 dpi, 36-bit, Windows 98 compatibility, HP PrecisionScan Lite
- 3 buttons for Scan, Copy and Email

## HP ScanJet 4100c

£79 (€92.82 inc VAT)

- USB, 300 x 600 dpi, Windows 95/98 compatibility, HP PrecisionScan Lite

## EPSON GT-9600 Flatbed Colour Scanner

### GT-9600

The most Advanced A4 flatbed scanner for professional & Business use.

- Optical Resolution 800x3200dpi with Micro Step Drive
- 36bit colour scanning and output
- Dynamic range of 3.3D
- EPSON Advanced Scanning Technology
- High speed scanning - a leader in it's class
- Professional Quality and Reliability
- Optional Auto Document Feeder & Transparency Unit
- 1 Year RTB with Optional 3 Year extended Warranty

from £411 (€482.92 inc VAT)



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EPSON CoverPlus three year extended warranty service available (Call for details inc VAT)

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**EPSON**

### GT7000

Flatbed Colour Scanner

- Affordable, compact colour flatbed scanner
- High quality 600x2400 dpi optical res with EPSON Micro step drive
- Can distinguish 68 billion different colours (36 bit)
- Start button for easy one touch scan
- Film adaptor inc for scanning negs & slides (GT-7000 Photo only)
- Ultra fast scanning - a leader in it's class
- Optional document feeder for added flexibility
- For Windows® 95/98, Windows® NT 3.51 or later & Mac

EPSON COVERPLUS +  
EPSON CoverPlus three year extended warranty service available (Call for details inc VAT)



GT-7000 £147 (€172.72 inc VAT)

EPSON FilmScan 200  
35mm Film Scanner £190 (€223.25 inc VAT)

EPSON COVERPLUS +  
EPSON CoverPlus three year extended warranty service available (Call for details inc VAT)

EPSON GT-9500 Flatbed colour image scanner  
from £324 (€380.70 inc VAT)

## EPSON PhotoPC 750z

2 Mega Pixel Zoom Digital Camera For Photographers and Business Use

- 2.0 Mega Pixels Output with HyPic™
- 6x Zoom - 3x Optical and 2x Digital
- Standard Direct Print Function up to A4 sized photo
- Solar Assist Dual back light 2 inch TFT colour LCD monitor
- High capacity NiMH batteries and charger included
- 4MB Internal Memory and optional external Compact Flash memory card
- Quick shoot - take high quality photos every 2 seconds
- Advanced features for excellent photo control
- Windows and Macintosh compatible
- Direct Print to (Photo Range + SC600,800,850,740)
- Excellent software package included • 1 year RTB Warranty

only £493  
(£579.27 inc VAT)



PhotoPC 750z



PhotoPC 700

EPSON PhotoPC 700  
Megapixel Auto Focus Digital Camera

only £303  
(£356.02 inc VAT)

# Imaging made clear with UMAX Scanners



Model	Standard	LE	Pro
Astra 1220 USB	£99 (£116.32)	£139 (£128.07)	£229 (£269.07)
Astra 1220 SCSI	£125 (£146.87)	£165 (£193.87)	£255 (£299.62)
Astra 1220 Parallel	£84 (£98.70)	£125 (£146.87)	£215 (£252.62)
Powerlook ColourStudio II			£699 (£821.32)

Pro = Transparency Adaptor, Photoshop LE available £30      LE = Photoshop LE

### Astra 1220U (USB)

FROM £99  
(£116.32)

- 36 bit colour scanning with B.E.T
- 600 x 1200 dpi
- Maximum resolution: 9600 x 9600 dpi
- Bundled software: PhotoDeluxe and PageManager

### Astra 1220P

FROM £84  
(£98.70)

- 36 bit colour scanning with B.E.T
- 600 x 1200 dpi
- Maximum resolution: 9600 x 9600 dpi
- Bundled software: PhotoDeluxe and PageManager
- EPP/SPP Parallel Port

### Astra 1220S (SCSI)

FROM £125  
(£146.87)

- 36 bit colour scanning with B.E.T
- 600 x 1200 dpi
- Maximum resolution: 9600 x 9600 dpi
- Bundled software: PhotoDeluxe and PageManager

### Powerlook II

FROM £699  
(£821.32)

WITH TRANSPARENCY ADAPTOR - while stocks last

Also available: **Powerlook II** WITH TRANSPARENCY ADAPTOR - while stocks last

All UMAX scanners supplied by Dabs Direct are genuine UK units and come with 2 yr RTB

Call for details of CoverPlus Extended Warranty

Scanners • Digital Cameras



Powerlook III with Tranny unit £1995 (€2344.12)  
Mirage SE A3 with Tranny unit £1469 (€1726.07)

All prices in brackets are inclusive of VAT



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## SCANNERS

ACER	ex VAT	inc VAT
AcerScan S310P Parallel	45	52.87
Falcon C310P	59	69.32
Falcon C310U USB	65	76.37
VuegoScan S310S SCSI	65	76.37
VuegoScan S310 USB	59	69.32
VuegoScan 610FT Parallel & Tranny Unit	129	151.57
VuegoScan 620P Parallel	69	81.07
VuegoScan 620S SCSI	99	116.32
VuegoScan 620ST SCSI inc Tranny Unit	149	175.07
VuegoScan 620U USB	79	92.82
VuegoScan 620UT USB inc Tranny Unit	Call	Call
<b>AGFA</b>		
SnapScan 310 Parallel	85	99.87
SnapScan 310 SCSI	99	116.32
SnapScan 600 SCSI	179	210.32
SnapScan 1212 Parallel	99	116.32
SnapScan 1212 USB	115	135.12
SnapScan 1236 SCSI	135	158.62
Arcus II	699	821.32
Arcus Solo	750	881.25
DuoScan T1200	549	645.07
<b>Accessories</b>		
SnapScan Automatic Document Feeder	159	186.82
<b>CANON</b>		
Canoscan FB320 Parallel	75	88.12
Canoscan 300S	155	182.12
Canoscan FB610 Parallel	189	222.07
Canoscan FB620 Parallel	139	163.32
DR3020 Document Management SCSI	3499	4111.32
<b>EPSON</b>		
GTx-5500 SCSI	161	189.17
GT-7000 SCSI	147	172.72
GT-7000 Photo SCSI	197	231.47
GTx-9500 Parallel/SCSI Bare	324	380.70
GTx-9500 Parallel	368	432.40
GTx-9500 SCSI	324	380.70
GT-9600	411	482.92
GTx-9600	454	533.45
FilmScan 200 SCSI	190	223.25
<b>Accessories</b>		
GT Automatic Document Feeder	309	363.07
GT Transparency Unit	359	421.82
<b>HEWLETT PACKARD</b>		
ScanJet 3200c	63	74.02
ScanJet 4100 Parallel	79	92.82
ScanJet 4200c	117	137.47



All Microtek scanners come with **Microtek Total Care**  
...if within the 12 month warranty period,  
hardware fails, then you receive a new scanner.

## MICROTEK



### Phantom 336cxUSB/636EPP

The Phantom 336cx USB is an ultra streamlined and compact design, measuring only 416 mm x 264 mm x 43 mm, small enough to fit in a briefcase.

- Resolution: 336cxUSB: 300 x 600 dpi, Interpolated 9600 dpi  
636EPP: 600 x 1200 dpi, Interpolated 9600 dpi
- Colour: 36 bit
- Interface: USB or Enhanced Parallel
- Software: Scan Wizard (PC), Caere OmniPage LE (OCR) (PC), iPhotoExpress, Microtek ScanSuite, Recognita OCR 636EPP only, PhotoAssistant 636EPP only

**Phantom 336cxUSB Hurry - Limited stock £75** (£88.12 inc VAT)  
**Phantom 636EPP £99** (£116.32 inc VAT)



### ScanMaker 336/X6

Place photos, drawings, logos or text pages into your computer applications

- Resolution: 336 4800 dpi maximum resolution  
X6: 9600 x 9600 dpi maximum resolution
- Colour: 36-bit
- Interface: SCSI
- Software: Scan Wizard (PC/Mac), Caere OmniPage LE (PC/Mac), Ulead PhotoImpact LE (PC), Kai's PhotoSoap (PC/Mac), DocuMagix PaperMaster (PC), ImagePals2Go! (PC, Win 3.X), ColorIt! (Mac)

**ScanMaker 336 £99** (£116.32 inc VAT)  
**ScanMaker X6 £139** (£163.32 inc VAT)



### ScanMaker 6400XL/9600XL (A3 Scanners)

The ScanMaker 6400XL & 9600XL are ideal for a corporate production environment.

- Resolution: 6400XL: 400 x 800 dpi, Interpolated 6400 dpi  
9600XL: 600 x 1200 dpi, Interpolated 9600 dpi
- Colour: 36 bit
- Scan Area: 304 mm x 430 mm (A3)
- Interface: SCSI
- Software: Scan Wizard (PC/Mac), Caere OmniPage LE (PC/Mac), Ulead PhotoImpact Full (PC), ImagePals2Go! (PC, Win 3.X), ColorIt! (Mac), Fractal Design Painter, Colour Management Software (PC/Mac) Silverfast

**ScanMaker 6400XL £799** (£938.82 inc VAT)  
**ScanMaker 9600XL £1499** (£1761.32 inc VAT)



### ScanMaker 4

ScanMaker 4 is a 32-bit all-in-one dual media scanner. This design eliminates the need for a separate film adaptor.

**ScanMaker 5 £1599** (£1878.82 inc VAT)



## SCANNERS

HEWLETT PACKARD continued	ex VAT	inc VAT
ScanJet 5100c USB/Parallel	156	183.30
ScanJet 6200C USB	237	278.47
ScanJet 6250C USB	275	323.12
ScanJet 6200/6250 SCSI Kit	65	76.37
ScanJet 5 Ethernet	1605	1885.87
<b>LOGITECH</b>		
PageScan USB	99	116.32
<b>MICROTEK</b>		
Phantom 336CX USB	75	88.12
ScanMaker 336 SCSI	99	116.32
Phantom 636 EPP	99	116.32
ScanMaker X6 SCSI	139	163.32
ScanMaker 4 SCSI	499	586.32
ScanMaker 6400XL A3 SCSI INC TMA	799	938.82
ScanMaker 5 SCSI	1599	1878.82
ScanMaker 9600XL A3 SCSI inc TMA	1499	1761.32
<b>MUSTEK</b>		
ScanExpress 6000P Parallel	39	45.82
ScanExpress 600 USB	59	69.32
ScanExpress 12000P Parallel	69	81.07
ScanExpress 6000SP Pro SCSI	69	81.07
ScanExpress 12000SP Pro SCSI	99	116.32
ScanExpress A3	129	151.75
<b>NIKON</b>		
Super Coolscan SCSI	995	1169.12
Super Coolscan SCSI & Photoshop LE	1114	1308.95
<b>POLAROID</b>		
SprintScan 35LE SCSI	419	492.32
SprintScan Plus SCSI	1199	1408.82
<b>UMAX</b>		
Astra 1220P Parallel	84	98.70
Astra 1220S SCSI	125	146.87
Astra 1220U USB	99	116.32
Powerlook ColourStudio II Pro SCSI	749	880.07
Powerlook III SCSI	1995	2344.12
Mirage II SE SCSI	1495	1756.62
Mirage II Pro SCSI	5999	7048.82
<b>Accessories</b>		
Astra Transparency Unit	149	175.07
<b>VISIONEER</b>		
PaperPort 3100	67	78.72
PaperPort 6100	85	99.87
PaperPort OneTouch	79	92.82
PaperPort Strobe Colour	139	163.32
PaperPort 5300	69	81.07

## AGFA Agfa

The complete picture.

### SnapScan 1212P



#### SnapScan 1212P

- Enhanced Parallel port (PC only)
- 36 bit colour depth
- 600 x 1200 ppi optical resolution
- Built-in Agfa colour management system
- Compatible with Windows 95, Windows 98 and Windows NT
- Software includes: Agfa Fotolook, & Agfa FotoSnap, iPhoto Express, OmniPage Limited Edition & Visioneer PaperPort

£99 (£116.32)

### SnapScan 1212U



#### SnapScan 1212U

- USB (PC)
- 36 bit colour depth
- 600 x 1200 ppi resolution (enhancement to 9600 x 9600 ppi)
- USB interface transfers 1MB per second
- Share between multiple PCs
- Software includes: Agfa Fotolook, & Agfa FotoSnap, iPhoto Express, OmniPage Limited Edition & Visioneer PaperPort
- Windows 98 only

£115 (£135.12)

### SnapScan 1236s



#### SnapScan 1236s

- SCSI interface scanner (PC and Mac)
- 36 bit colour depth
- 600 x 1200 ppi resolution (enhancement to 9600 x 9600 ppi)
- Compatible with Mac and PC systems
- PC Scanner controls supports Windows 95, Windows 98 & Windows NT
- Software includes: Agfa Fotolook, & Agfa FotoSnap, iPhoto Express, OmniPage Limited Edition & Visioneer PaperPort

£135 (£158.62)

Prices shown in brackets include VAT

## visioneer Scanners

**PAPERPORT ONE TOUCH** Only  
**5300 SCANNER £69** (£81.07)

Scan, Copy, Fax or Email\* - with one touch of a button!



- 300 x 600 dpi optical resolution; 2400 dpi enhanced
- 36-bit photorealistic colour
- 5 'One Touch' buttons
- Supports Windows 95/98 and NT4.0

### PAPERPORT Colour Strobe

With PaperPort Strobe, you can organise, edit, fax, e-mail, & publish using the world's most popular paper management software.

- Manage all your paper & images on screen organise
- Fax\* and Email • Paperport Links™

£139 (£163.32)

### PAPERPORT 6100



£85 (£99.87)

Easiest flatbed scanner to use, Guaranteed!

- 600 x 1200 dpi optical resolution; 2400 dpi enhanced
- 36-bit photorealistic colour • One pass scan
- Flatbed design allows for more flexible scanning

### PAPERPORT 3100



£67 (£78.72)

Best value for money scanner

- 300 x 600 dpi optical resolution; 2400 dpi enhanced
- 30-bit photorealistic colour
- Flatbed design allows for more flexible scanning

Prices shown in brackets are inclusive of VAT

\* printer & modem required to print, fax & email

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- 4800dpi or 9600dpi max resolution
- High speed one pass scan (5 sec preview)
- 30bit colour (310/620), 36bit (620)
- Ulead iPhoto Plus & Xerox textbridge inc.
- USB for Windows 98 (310/610/620)
- Parallel (310P/620P) or SCSI II (310S/620S) interface (SCSI card included)

**Acer Scan**  
310/620

\*Windows 98 compatible



CAN YOU SCAN SLIDES OR NEGATIVES?  
610PT 9600dpi, Parallel £129 (£151.57 inc VAT) with built in transparency adaptor.  
620ST 9600dpi, SCSI £149 (£175.07 inc VAT) with built in transparency adaptor.

- C310P 4800dpi, slimline £59\* (£69.32 inc VAT)
- 310P 4800dpi, Parallel £49\* (£57.57 inc VAT)
- 310U 4800dpi, USB £59\* (£69.32 inc VAT)
- 310S 4800dpi, SCSI £65\* (£76.37 inc VAT)
- 620P 9600dpi, Parallel £69\* (£81.07 inc VAT)
- 620S 9600dpi, SCSI £99\* (£116.32 inc VAT)
- 620U 9600dpi, USB £79\* (£92.82 inc VAT)

1999 Sanyo digiCAM'S



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The world's first digital camera with solar powered LCD display.  
digiCAM 400, Megapixel Optical Zoom  
IN STOCK NOW! £499 (£586.32)

Models	digiCAM VGA 210/XGA 300	digiCAM VGA 250/XGA 350	digiCAM 400
Resolution	640 x 480/1024 x 768	640 x 480/1024 X 768	1280 x 960
Sound with each picture	Yes	Yes	Yes
Auto timer, focus, flash	6 seconds/4 seconds	4 seconds	4 seconds
Camcorder mode	No	10 seconds/60 seconds	No
Zoom	No/Yes x3	x2	optical x3/digital x2
Memory	4MB/8MB/16MB removable	4MB/8MB/16MB removable	4MB/8MB/16MB removable
TFT display & viewfinder	Yes	Yes	Yes
Price (inc VAT)	£199 (£233.82)	£279 (£327.82)	£499 (£586.32)



**HP PhotoSmart C30**  
1MP Digital Camera

Delivers sharp 1 megapixel (1152 x 872) resolution with 2x digital zoom for printing real photos that are brighter, sharper and more true to life.

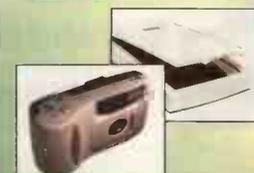
- 4MB CompactFlash card stores photos at three resolutions: Normal: 40 photos, Fine: 20 photos, Superfine: 8 photos
- Auto flash with flash fill and red-eye reduction options.
- Auto focus, plus macro mode for quality closeups.
- Colour 1.8-inch LCD for viewing
- AC Adapter which extends battery life.
- 9-pin serial PC cable (RS-232)
- HP PhotoSmart Photo Finishing software
- 4 AA alkaline batteries
- Camera strap
- Multi-media how-to's and installation instructions. on-line help, user guide



HP PhotoSmart C30 Digital Camera  
£299 (£351.32 inc VAT)



All Mustek products are fully TWAIN compliant  
All Mustek scanners are single pass  
All Mustek scanners include image editing and OCR software



**VDC-300 Digital Camera**

- Connects by USB or RS-232
- Up to 640x480 res (470k CCD)
- 2MB Memory (Up to 50 frames)
- 45mm TFT LCD preview/menu
- Flash & self timer
- View images on TV (PAL)
- Inc: editing software, batteries

£169 (£198.57 inc VAT)

**Flatbed-A4 Colour Scanners**

- **ScanExpress 600 USB** £59 (£69.32 inc VAT)
  - Resolution: 300x600 dpi (9600 x 9600 Interpolated)
  - 30bit Colour Depth (1.1 billion colours)
- **ScanExpress 600CP (Parallel)** £39 (£45.82 inc VAT)
  - Resolution: 300x600 dpi (9600 Interpolated)
  - 30bit Colour Depth (1.1 billion colours)
- **ScanExpress 12000P (Parallel)** £69 (£81.07 inc VAT)
  - Resolution: 600x1200 dpi (9600 Interpolated)
  - 36bit Colour Depth (68.7 billion colours)
- **ScanExpress 6000SP Pro** £69 (£81.07 inc VAT)
  - Resolution: 300x600 dpi (4800 Interpolated)
  - 30bit Colour Depth (1.1 billion colours)
  - Includes a SCSI interface
- **ScanExpress 12000SP Pro** £99 (£116.32 inc VAT)
  - Resolution: 600x1200 dpi (9600 Interpolated)
  - 36bit Colour Depth (68.7 billion colours)
  - Includes a SCSI interface



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- Channel preview, displaying all channels at once
- Wide screen
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**QV-7000SX**  
Digital Camera

- Removable Flash Cards (8Mb included)
- Large 2.5" TFT display
- Zoom (2x optical & 4x digital)
- 1280 x 960 DPI resolution (SXGA)
- VideoOut for TV (PAL/NTSC)
- 12.8 sec Mini Movie
- PC software & connection kit included

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£249 (£292.57 inc VAT)



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**ePhoto CL30 NEW** The complete picture.

**Digital Camera** £229 (£351.32 inc VAT)

- One megapixel CCD sensor (1152 x 864): 1.5 megapixel (1440 x 1080) output (with AgfaPhotoGenie) for high quality prints
- Optical viewfinder and LCD • USB Interface
- CompactFlash removable memory (4MB CompactFlash card included)
- EasyPilot single button control • QuickReview
- B & W text mode - record and document text images for later conversion using OCR software
- Video out (switchable NTSC/PAL format)
- Agfa PhotoWise with PhotoGenie



**ePhoto 1280**

**Digital Camera** £399 (£468.82 inc VAT)

- Includes: Agfa PhotoWise
- Outstanding print quality, up to 1.2 million colours (1280 x 960) with Agfa PhotoGenie
- Removable memory stores 6-60 images per 4MB SSSDC Card (one included)
- FlashTrack swivel zoom lens (280° swivel)
- Built-in auto flash from 3-10 feet (0.9m - 3m)



**Desktop Video Camera**

Get into the picture with Philips Parallel port Desktop Video Camera

- High picture quality digital desktop video camera • Built-in Microphone
- Its pivoting and rotating lens allows you to easily adjust, point and focus
- High-quality streaming video performance of up to 320 x 240 pixels
- Make and send brilliant videomails in exhilarating colours with audio



**USB Digital Desktop Video Camera**

Picture this Universal connectivity!

- Digital audio camera with built-in mic, powered through USB
- Streaming video performance up to 176x144 pixels & 352x288
- Point & press (instant VGA snapshot photo), hassle free
- Includes Philips Videogram software



PCA645VC £65 (£76.37 inc VAT)

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	ex VAT	inc VAT
<b>AGFA</b>		
ePhoto 1280	399	468.82
ePhoto 1680	525	616.87
ePhoto CL30	229	351.32
<b>CANON</b>		
PowerShot A5	389	457.07
PowerShot 600	529	621.57
PowerShot Pro 70	899	1056.32
<b>CASIO</b>		
QV-700	239	280.82
QV-5000SX	349	410.07
QV-7000	399	468.82
<b>EPSON</b>		
PhotoPC 600	249	292.57
PhotoPC 700	308	361.90
PhotoPC 705z	493	579.27
Accessories		
PhotoPC 600 AC Adaptor	49	57.57
PhotoPC 600 4Mb Card	99	116.32
PhotoPC 600 15Mb Card	259	304.32
<b>FUJI</b>		
DX-10	199	233.82
MX-500	365	428.87
MX-600	399	468.82
MX-700	299	351.32
Accessories		
Mains Adaptor	25	29.37
<b>HEWLETT PACKARD</b>		
HPC 30	299	351.32
<b>HITACHI</b>		
MPEG Video Camera	1449	1702.57
<b>KODAK</b>		
DC210 Plus	339	398.32
DC220 Serial/USB	419	492.32
DC260 Serial/USB	595	699.12
Accessories		
DC200/210 AC Adaptor	46	52.87
DC120 Wide Angle Set	139	163.32
DC200/210 Mac Kit	29	34.07
FD-300	249	292.57
4Mb CompactFlash Card	49	57.57
10Mb CompactFlash Card	89	104.57
20Mb CompactFlash Card	145	170.37
External CompactFlash Card Reader	145	170.37
<b>MUSTEK</b>		
VDC-300	169	198.57
<b>NIKON</b>		
CoolPix 600	375	440.62
CoolPix 900	594	697.95
CoolPix 900 Premiere	646	759.05
<b>OLYMPUS</b>		
C-830L	459	539.32
C-900	499	586.32
C-1400XL	799	938.82
Accessories		
MA-1E SmartMedia PCMCIA Adaptor	79	92.82
C-1400L AC Adaptor	55	64.62
<b>PHILIPS</b>		
PCA-635VC Parallel	65	76.37
PCA-645VC USB	65	76.37
<b>SANYO</b>		
digicAM 200	179	210.32
digicAM 210	199	233.82
digicAM 250	249	292.57
digicAM 300 XGA	279	327.82
digicAM 350 XGA	235	276.12
digicAM 400	499	586.32
Accessories		
digicAM 200/210/300 AC Adaptor	49	57.57
digicAM 250/350 AC Adaptor	49	57.57
<b>SONY</b>		
DSC-F1	375	440.62
Mavica FD71	379	445.32
Mavica FD81	459	539.32
DCR SC100e	695	816.32
Accessories		
Mavica Stamina Battery	47	55.22
DSC-F1 Battery	35	41.12
DSC-F1 Fast Charger	49	57.57
<b>UMAX</b>		
DC - F1	279	327.82

## TERMINALS

	ex VAT	inc VAT
<b>WYSE</b>		
WY-35 with keyboard	239	280.82
WY-55ES	199	233.82
WY-65ES	275	323.12
WY-120ES	255	299.62
WY-160ES	299	351.32
WY-185ES with keyboard	275	323.12
WY-325ES	379	445.32
WY-520ES	215	252.62

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digital science™

### DC210 PLUS JUST POINT AND SHOOT!

The most advanced, most affordable and easiest-to-use digital camera in its class

- 1152 x 864 Megapixel image quality
- 2 x zoom lens with close-up mode
- Award winning design and user interface
- Plug into your TV to view your pictures!
- LCD review and preview display for instant results



**£339** (£398.32 inc VAT)

### DC220 and DC260

A WORLD OF PICTURE-TAKING POWER IN THE PALM OF YOUR HAND

Intelligent cameras with a host of advanced features, yet still so simple to use - you won't believe it!

- Up to 1 million pixels resolution (DC220)
- Up to 1.6 million pixels resolution (DC260)
- Combined optical and digital zooms
- Burst, time lapse and scripting capability
- Large 2" LCD preview and review display plus record and playback voice annotations
- Fully USB compatible



**DC220 £419** (£492.32 inc VAT)  
**DC260 £595** (£699.12 inc VAT)

AND WHAT'S MORE...all cameras shown include:

- Reusable 8MB CompactFlash memory card for tons of storage
- Free AC adapter
- Superb software bundle - Adobe Photodeluxe, PageMill and Kodak Picture Easy 3.0 for easy image manipulation

### DVC323

USB DIGITAL VIDEO CAMERA

**£129** (£151.57 inc VAT)

The fast, easy way to capture and share pictures and videos

- Full 30-frames-per-second video
- Includes all the software you need to create, edit and share pictures or video



### Pace Colour Video Camera USB

- Digital colour camera that connects directly to a USB ready PC
- Send 'Video Emails' to family and friends
- Capture and store still or live video images
- Video-conference over phone lines, ISDN, the Internet or LANs
- Software extras include Gotcha, Photowallet and Face-it
- 24-bit colour and frame rates of up to 30 per second
- Plug & play for easy installation



**£65** (£76.37 inc VAT)

### Pace Colour Video Camera PCI

- Digital colour camera supplied with PCI video capture card
- Input images from a camcorder or VCR
- Send 'Video Emails' to family and friends
- Capture and store still or live video images
- Video-conference over phone lines, ISDN, the Internet or LANs
- Software extras include Gotcha, Photowallet and Face-It
- 24-bit colour and frame rates of up to 30 per second



**£65** (£76.37 inc VAT)

Ultracompact, High-Resolution Digital Camera

### COOLPIX600

**Nikon**



#### Features

- 1024 x 768 resolution
- 800,000 (effective) - pixel CCD
- Auto exposure and autofocus
- Two macro positions
- Five image quality modes
- (Fine/Normal/Zoom/Mini/Wide)
- Selectable shutter speed up to 1/2,000 sec
- Manual exposure compensation
- 2-in. high-resolution LCD panel
- Digital 2x zoom
- Digital Camera Station
- Nikon View 600 image transfer software
- Adobe® PhotoDeluxe®

**STANDARD BUNDLE** - includes Coolpix 600 Digital Camera with 8MB compact flash card and Adobe PhotoDeluxe software.  
**£375** (£440.62 inc VAT)

**PREMIERE BUNDLE** - includes Coolpix 600 Digital Camera with power supply, 8MB compact flash card and Adobe PhotoDeluxe software.  
**£379** (£445.32 inc VAT)

from only **£375**  
(£440.62 inc VAT)

## MEMORY CARDS

	ex VAT	inc VAT
<b>SMARTMEDIA CARDS</b>		
4MB	29	34.07
8MB	39	45.82
<b>COMPACT FLASH/PCMCIA CARDS</b>		
4MB	39	45.82
8MB	49	57.57
16MB	79	92.82
32MB	129	151.57
Compact Flash - PCMCIA Adaptor	15	17.62

## CARD READERS

	ex VAT	inc VAT
<b>CHASE</b>		
CARDport SwiftSM SmartMedia Parallel	69	81.07
CARDport SwiftSM CompactFlash Parallel	69	81.07
CARDport solo Internal Front	79	92.82
CARDport uno Internal Rear	75	88.12
CARDport isa Internal Front/Rear	125	146.87
CARDport ex2 External Parallel	119	139.82

## VIDEO CONFERENCING

	ex VAT	inc VAT
<b>BARAKA</b>		
VidCall32 Parallel Video Conferencing Kit	169	198.57
Cinemail software	59	69.32
<b>CREATIVE LABS</b>		
VideoBlaster WebCam II	55	64.62
<b>INTEL</b>		
Create & Share USB	99	116.32
Create & Share PCI	139	163.32
ProShare Video Conferencing 200	599	703.82
ProShare Video System 200	849	997.57
<b>KODAK</b>		
DVC323 Desktop USB	129	151.57
<b>LOGITECH</b>		
QuickCam VC Parallel PC	55	64.62
QuickCam Home PC	65	76.37
QuickCam VC USB Win	65	76.37
QuickCam Pro USB	75	88.12
<b>MODULAR TECHNOLOGY</b>		
QuartzSight Video Camera / TV Tuner Kit	89	104.57
<b>PACE</b>		
Desktop Colour Camera PCI	65	76.37
Desktop Colour Camera Kit USB	65	76.37
<b>VIDEOLOGIC</b>		
Captivator PCI/VC	149	175.07
<b>ZOOM</b>		
Desktop Colour Camera	68	79.90

## PROJECTORS

	ex VAT	inc VAT
<b>CTX</b>		
Ez500 VGA 240Lm	1289	1514.57
Ez550 SVGA 300Lm	1399	1643.82
Ez600 SVGA 550Lm	2459	2889.32
<b>EPSON</b>		
EMP-5100 SVGA 750Lm	3995	4694.12
EMP-7100 XGA 650Lm	4995	5869.12
EMP-7300	8349	9810.07
EMP-7500 XGA 800Lm	5495	6456.63
<b>PHILIPS</b>		
ProScreen 4100 300Lm	1999	2348.82
Endurance 4600 SVGA 500Lm	2499	2936.32
Impact 4600 SVGA 650Lm	2669	3136.07
<b>PROXIMA</b>		
DP5800 SVGA 650Lm	2599	3053.82
DP5900 SVGA 700Lm	2999	3523.82
DP9200 XGA 500Lm	5449	6402.57
<b>SANYO</b>		
PLC-5605 SVGA 700Lm	3499	4111.32
PLC-8815 XGA 550Lm	4695	5116.62
PLC-9005 XGA 1500Lm	7699	9046.32
PLC-SU15	3499	4111.32
<b>SONY</b>		
VPL-S600 SVGA 650Lm	3699	4346.32
VPL-X600 XGA 600Lm	4499	5286.32

## GRAPHICS TABLETS

	ex VAT	inc VAT
<b>CALCOMP</b>		
Creation Station A5 Pro	199	233.82
Creation Station A5 & Painter v5	299	351.32
Creation Station A4 & Painter v5	399	468.82
Creation Station A3	399	468.82
All Calcomp include Pen & Mouse		
<b>WACOM</b>		
Pen Partner	59	69.32
Pen Partner & Disney MagicArtist	69	81.07
Pen Partner & Painter Classic	69	81.07
Intuos A6	119	139.82
Intuos A5	209	245.57
Intuos A4	275	323.12
Intuos A4 Oversized CAD	305	358.37
Intuos A4 Oversized DTP	399	468.82

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**MODEMS**

	ex VAT	inc VAT
<b>3COM</b>		
Sportster WinModem 56K Internal	54	63.45
Sportster WinModem 33K6 PCMCIA	69	81.07
Megahertz 56K Global PCMCIA	105	123.37
56k V90 Faxmodem External	59	69.32
56k V90 Voice Faxmodem Internal	68	79.90
56k V90 Voice Faxmodem External	75	88.12
56K V90 Message Modem	88	103.40
56K V90 Professional Message Modem	110	129.25
Courier V34 Internal	195	229.12
Courier V34 External	195	229.12
<b>DABS</b>		
56k V90 Voice Internal	39	45.82
56k V90 Voice Internal PCI	39	45.82
56k V90 Voice External	55	64.62
56K PCMCIA	69	81.07
<b>DIAMOND</b>		
Supra Express 56K Pro Internal	39	45.82
Supra Express 56K Pro External	59	69.32
<b>HAYES</b>		
Accura 56K V90 Voice Internal	79	92.82
Accura 56K V90 Voice External	85	99.87
Accura 56K V90 Voice MSN Internal	85	99.87
Accura 56K V90 Voice MSN External	95	111.62
BT Accura 56K V90 Internet Kit	99	116.32
Optima 366 Business	149	175.07
Optima 336 Global PCMCIA	125	146.87
Optima 56K Global PCMCIA	155	182.12
<b>MODULAR TECHNOLOGY</b>		
SuperHighway 56K V90 Voice Internal	39	45.82
SuperHighway 56K V90 Voice Internal PCI	39	45.82
SuperHighway 56K V90 Voice External	49	57.57
SuperHighway 56K V90 PCMCIA	75	88.12
<b>MULTITECH</b>		
MT5634ZPX 56K Voice Internal	85	99.87
MT5634ZPX 56K Voice Internal/PCI	85	99.87
MT5600ZDX 56K External	75	88.12
MT5600ZDXV 56K Voice External	99	116.32
MT2384LTI 33K6 PCMCIA	129	151.57
MT5634ZBA-USB 56k Voice External USB	115	135.12
MT5634ZLXI 56K PCMCIA	135	158.62
<b>PACE</b>		
Voice 56k V90 Internal	65	76.37
Voice 56k V90 External	79	92.82
NB 56K PCMCIA	95	111.62
Solo 56K V90 External	145	170.37



**Pace 56 Solo**

- 56kpbs self-memory messaging system
- V90, 56kpbs voice/fax/data modem with on-board memory
  - Receives & stores voice & fax messages even with your PC off
  - Stores a combination of approximately 30 minutes of speech or 30 pages of fax
  - Retrieve your voice messages without your PC
  - Retrieve your fax messages without having to view them first
  - New audible UK Calling Line Identification
  - Hands free speaker phone without your PC
  - Flash upgradeable to future standards
  - Contacts you on the move to let you know you have messages waiting - remote access for message collection
  - Automatically discriminates between voice, fax & data calls

£135  
(£158.62)



**Pace 56 Voice**

- 56kpbs voice/fax/data external or internal modem
- Super fast 56,000bps internet download (V90)
  - Voice mail, fax mail & email
  - UK Calling Line Identification
  - Flash upgradeable to future standards
  - Full duplex, hands free, speaker phone capability
  - Private mailboxes for multiple users
  - Remote access for message collection

INTERNAL  
£65  
(£76.37)



EXTERNAL  
£83  
(£97.52)

**Pace NB 56 Voice**

- 56kpbs voice/fax/data PC Card modem
- Super fast 56,000bps internet downloads (V90)
  - Voice mail, fax mail & email
  - Enhanced throughput up to 230.4kpbs
  - UK Calling Line Identification
  - Flash upgradeable to future standards
  - Ultra low power operation & standby mode
  - True hardware implementation, unlike winmodem solutions

PC CARD  
£95  
(£111.62)



**Pace ISDN Terminal Adaptor**

- Complete package for high speed digital communications
- Basic Rate ISDN interface (2 x 64k)
  - Channel bonding for data transmission at 128kpbs
  - Enhanced serial interface for up to 230.4kpbs
  - 2 analogue ports for telephone/fax/modem connections
  - Simultaneous voice & data over a single ISDN line
  - Multiple Subscriber Numbering
  - Euro ISDN approved for use throughout Europe

£175  
(£205.62)



All Pace products are supplied with cables, user guide, software suite & free internet trials. Unlimited help desk support is available and products are covered by a 5 year guarantee. CONEXANT is a trademark of CONEXANT SYSTEMS, INC. Prices shown in brackets are inclusive of VAT

**MODEMS CONTINUED**

	ex VAT	inc VAT
<b>PSION DACOM</b>		
Gold Card V34+ Global PCMCIA	115	135.12
Gold Card 56K Global PCMCIA	145	170.37
<b>Accessories</b>		
Gold Card ISDN Upgrade	125	146.87
Nokia 2110/ 6110/ 8110 GSM Kit	79	92.82
Panasonic GSM Kit	79	92.82
<b>XIRCOM</b>		
Credit card 56K PCMCIA	119	139.82
RealPort 56K GlobalAccess PCMCIA	129	151.57
Ericsson Global Access GSM PCMCIA	109	128.07
Siemens S3/S4 Global GSM PCMCIA	109	128.07
Philips Global Access GSM PCMCIA	109	128.07
Nokia 2110/8110 Global GSM PCMCIA	109	128.07

**ISDN TERMINAL ADAPTORS**

	ex VAT	inc VAT
<b>3COM</b>		
Sportster ISDN External	99	116.32
Courier-I ISDN & 33K6 Modem Int/Ext	239	280.82
<b>DYNALINK</b>		
ISDN Terminal Adaptor Internal with Voice	59	69.32
ISDN Terminal Adaptor Internal PCI	39	45.82
<b>EICON</b>		
Divva 2.0 ISA	45	52.87
Divva 2.0 PCI	49	57.57
Divva Pro 2.0 PCI	199	233.82
Divva Pro 2.0 PCMCIA	195	229.12
Divva Server BRI-2M ISA	329	386.57
Divva Server BRI-2M PCI	319	374.82
Divva Terminal Adaptor External	155	182.12
Divva LAN ISDN Modem	275	323.12
Divva Modile PCMCIA V.90	275	323.12
<b>MULTITECH</b>		
MT128ISA-SD 128K Internal	39	45.82
MT128ISA-SV 128K Internal & Voice	75	88.12
MT128PCI-SD 128K Internal PCI	39	45.82
MT56128LX 128K & 56K PCMCIA	189	222.07
<b>PACE</b>		
UltraLink External	175	205.62
<b>VIRTUAL ACCESS</b>		
LinXpeed 10 External	129	151.57
LinXpeed 20 External with Voice	169	198.57
<b>XIRCOM</b>		
CreditCard ISDN PCMCIA	159	186.82
RealPort ISDN Upgrade Kit	95	111.62

Modems . ISDN Adaptors

**56K\* Professional Message Modem**



New innovative, feature enhanced message modem offers high quality faxmodem & answering machine function. Easy to use communications software has been specifically designed to utilise all the new features.



- FREE flash upgrade to the V.90 ITU 56K standard
- Includes x2™ technology
- Answerphone and Message Management
- Stores voice and fax messages when your PC is switched off
- Built-in voice quality speaker & microphone
- Flash ROM memory for easy upgrades

£110  
(£129.25 inc VAT)

**56K\* Message Modem**

Includes V.90 56K\* standard and x2™ technology  
Complete feature-rich communications package for the home or office. The 56K\* Message Modem can be left to store incoming fax and voice messages even when your computer is switched off.



- Integrates V.90 56K\* standard and x2™ technology
- Flash ROM memory for future upgrades
- Internet ready
- Compatible at 33,600bps and other modem speeds
- Full Duplex speakerphone
- Remote voice message and fax retrieval

£88  
(£103.40 inc VAT)

3COM MODEMS ARE SUPPLIED WITH A LIFETIME WARRANTY AND FREE LIFETIME TECHNICAL SUPPORT

**56K\* Voice Faxmodem & 56K\* Faxmodem**

Includes V.90 56K\* standard and x2™ technology

- Flash ROM memory for easy upgrades
- Enhanced internet experience and save £'s on telephone bills
- compatible at 33,600bps & other modem speeds
- Full Duplex speakerphone (only Voice Faxmodem)
- Single/multiple mailboxes with security (only Voice Faxmodem)
- Call discrimination: Voice/Fax/Data (only Voice Faxmodem)



56K* Voice Faxmodem	Internal	£69	(£81.07 inc VAT)
56K* Voice Faxmodem	External	£75	(£88.12 inc VAT)
56K* Faxmodem		£59	(£69.32 inc VAT)



**Megahertz 56K\* Global PC CARD**

The 3Com MegaHertz® 56k Global modem delivers hassle free access for international travellers. It features 56k technology for high speed Internet downloads and WorldPort® country selection software.

- X2® technology at up to 56kpbs
- Flash ROM for easy upgrades of virtually any function using software downloads
- Guaranteed compatibility with PC Card Standard 2.1
- Intelligent Auto Install in a matter of minutes
- Digital line guard protects from damage from digital or PBX phone lines
- Data and Fax software included



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<b>AVRO PACIFIC</b>		
Fax Friend	49	57.57
International Modem adaptor kit	39	45.82
<b>BROTHER</b>		
Fax-510	127	149.22
Fax-520 TAM	170	199.75
Fax-920	170	199.75
Fax-930	212	249.10
<b>CANON</b>		
T-21	185	217.37
T-31	215	252.62
T-30 Inkjet	249	292.57
B-110 Inkjet TAM	329	386.57
B-150 Inkjet	239	280.82
L-250 Laser	529	621.57
L-300 Laser	719	844.82
L-800 Laser	1079	1267.82
L-900 Laser	1235	1451.12
<b>OKI</b>		
Okifax 460 TAM	209	245.57
Okifax 610	199	233.82
Okifax 660	229	269.07
Okifax 740	279	327.82
Okifax 4100	419	492.32
Okifax 5200	729	856.57
Okifax 5500	899	1056.32
<b>PANASONIC</b>		
KX-F2680	185	217.37
KX-F2780	209	252.62
UF-S1 TAM	235	280.82
KX-F1810 Plain Paper	245	292.57
UF-S10 TAM	259	307.82
KX-F1830 Plain Paper	275	323.12
UF-332 Plain Paper TAM	399	466.82
UF-550 Laser	639	739.07
UF-560 Laser	689	797.82
<b>SAMSUNG</b>		
SF-150	115	135.12
F-150T	145	170.37
SF-3000T Inkjet TAM	209	245.57
SF-4500 Inkjet	225	264.37
SF-5500 Laser	329	386.57
SF-5600 Laser	509	598.07
SF-6000 Laser	565	663.82
SF-6100 Laser	635	746.12

## NEW MFC-740

The MFC-740 is a 6 in 1 Colour Multi-Function with Videocapture Mode

- only £425** (£499.37 inc VAT)
- Videocapture
  - Plug in your digital camera, video camera or VCR & colour print an image without the need for a PC
  - As a Colour Printer**
  - Up to 1440x720 dpi colour printing
  - Up to 4ppm colour, up to 6ppm mono (draft)
  - As a Fax Machine**
  - Fast 14,400bps modem • Dual access memory
  - Digital Answering Machine - up to 99 mins reg time
  - 174 broadcast locations
  - As a Colour Scanner**
  - Up to 1200x1200 dpi colour resolution with OCR
  - TWAIN interface
  - TIFF/BMP formats
  - As a Colour Copier**
  - Up to 99 colour copies
  - 60-200% reduction/enlargement
  - PC Faxing (Monocolour)**
  - Send mono/colour faxes from any Windows application (v3.11+)
  - View received faxes straight onto your PC



## FAX-920

The FAX-920 is versatile enough for use both at home or in the office

- only £170** (£199.75 inc VAT)
- Fixed cost per copy
  - Plain paper fax
  - 10 sheet document feeder
  - 100 sheet paper supply
  - Caller line identification
  - Fax forwarding/Retrieval
  - 28 page memory (512KB)
  - 48 speed dial stations
  - 64 grey scale
  - Optional PC interface
  - Personal copy mode
  - Answer machine interface



### FAX-930

As Fax-920 with TAM

**£212** (£249.57 inc VAT)

### FAX-1020

Plain Paper Fax

**£238** (£279.55 inc VAT)

### FAX-1030

Plain Paper Fax with TAM

**£255** (£299.57 inc VAT)

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**MODULAR**

See page 30 for TV Tuner!  
See page 30 for Video Card!  
See page 32 for Modems!

- K56Flex/V90, download speed up to 56kbps & upload speed up to 33.6Kbps\*
- Fax upto 14,400bps
- Telephone Answering machine (ex-PCMCIA)
- Full Duplex Speaker-phone (ex-PCMCIA)
- Includes Supervoice software & cables
- Free Internet trials

\*Conditions & connection permitting

**INTERNAL £39** (£45.82 inc VAT)  
**EXTERNAL £49** (£57.57 inc VAT)  
**PCI INTERNAL £49** (£57.57 inc VAT)  
**PCMCIA £85** (£99.87 inc VAT)

**V.90**



## HP OfficeJet 700

The HP All-in-one product that makes it easy to do your work & communicate in colour

- Print, Copy, Scan in Colour
- Colour fax (PC assisted)



### Features...

- 600x600 dpi Black Text
- 600x300 dpi Colour Printing with PhotoRET
- 5ppm black 2ppm colour
- 50 speed dials and 50 page memory
- 1200 dpi enhanced colour scanning
- Windows®95, 98 and NT compatible
- Software: Caere OmniPage LE OCR, Adobe PhotoDeluxe
- One-year warranty with on-site exchange

**£323** (£379.52 inc VAT)

With HP SupportPack **£394** (£462.95 inc VAT)



## HP OfficeJet Pro 1170C

The professional assistant that does it all with style. Handles a variety of paper and other media with high quality results.

- Print, Copy, Scan in Colour



### Features...

- 600x600 dpi Black Text
- 600x300 dpi (with CREt II) Colour Printing
- 9ppm black 5ppm colour
- 1200 dpi enhanced colour scanning
- Digital Zoom 50% to 400%
- Windows®95, 3.1x compatible or Win NT
- Software: Scan Picture, OCR, and Adobe Photo Deluxe
- One-year warranty with on-site exchange

**£489** (£574.57 inc VAT)

With HP SupportPack **£607** (£713.22 inc VAT)

## A complete range of All-in-One

<http://www.hp.com/go/all-in-one>

## HP OfficeJet Pro 1175C

The professional assistant with fast performance, quality results plus the efficiency of an Automatic Document Feeder.

- Print, Copy, Scan in Colour
- Fax, through PC modem



### Features...

- 600x600 dpi Black Text
- 600x300 dpi (with CREt II) Colour Printing
- 9ppm black 5ppm colour
- 1200 dpi enhanced colour scanning
- Digital Zoom 25% to 400%
- Windows®95, 3.1x compatible or Win NT
- Software: Scan Picture, OCR, Adobe Photo Deluxe and WinFax Pro
- One-year warranty with on-site exchange

**£614** (£721.45 inc VAT)

With HP SupportPack **£754** (£885.95 inc VAT)

## HP LaserJet 3100

The professional workhorse for high quality and productive business communications

- Laser Printer, Fax, Copier and Scanner
- Standalone fax and copy facility



### Features...

- 600x600 dpi
- 6ppm
- 175 speed dials, up to 150 page memory
- 600 dpi enhanced scanning
- 50% to 200% reduction/enlargement
- Windows®95, 3.1x compatible or Win NT
- Software: Integrated JetSuite Pro Desktop software and ReadIRIS Pro PCR
- One-year warranty with on-site exchange

**£489** (£574.57 inc VAT)

With HP SupportPack **£607** (£713.22 inc VAT)

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## Three new page printers from OKI

Take a look at the three new Oki page printers, all offering the superb performance and reliability you can expect from Oki. Fast print speeds, excellent quality and flexible paper handling, as well as Oki's LED print technology, ensure that you get the most out of whichever Oki page printer you choose.

### OKIPAGE 8p

- LED 8 ppm page printer with PCL6
- 600 x 1200 dpi resolution
- 2Mb RAM, upgradeable to 6Mb
- DOS, Windows 3.1/95/98 & Windows NT

**£184** (£216.20 inc VAT)



### OKIPAGE 10ex

- LED 10 ppm page printer with PCL6
- 600 x 1200 dpi resolution
- 2Mb RAM, upgradeable to 35Mb
- DOS, Win 3.1/95/98 & Windows NT
- 250 sheet input tray

**£235** (£276.12 inc VAT)



### OKIPAGE 12i/n

- PCL6 and Adobe PostScript Level II
- LED 12 ppm page printer
- 600 x 1200 dpi resolution
- 4Mb RAM, upgradeable to 36Mb
- Ethernet 10 Base T as standard
- DOS, Windows 3.1/95/98 & Windows NT

**£410** (£481.75 inc VAT)



### OKIPAGE 16n

- LED 16 Pages per minute
- 600 x 600 dpi
- 6Mb of memory
- Up to 1200 sheet paper capacity

**£579** (£680.32 inc VAT)



### OKIPAGE 20n

- LED 20 ppm page printer with PCL6
- 600 x 1200 dpi resolution
- Fast MIPS R3000 RISC processor
- 8Mb RAM, upgradeable to 68Mb
- Optional Adobe PostScript Level II
- OKIVIEW network management software
- Bi-directional parallel and serial interface

**£729** (£856.57 inc VAT)



### OKIPAGE 8c

The OKIPAGE 8c enables fast 8 ppm colour printing. With a choice of four colour management systems & excellent paper handling capacity, it is the ideal colour page printer for the workgroup.

- LED 8 ppm colour page printer
- True 600 x 600 dpi resolution
- 32 seconds to first print
- 16 MB RAM, upgradable to 80 MB
- 500 sheet paper tray
- 4 colour management systems
- Unique colour tandem engine
- PostScript Level 3 emulation
- Ethernet option with the OKIPAGE 8cen at £2129

**NEW PRICE £1949** (£2290.07 inc VAT)



### OKIPAGE 4w plus

- LED 4 ppm page printer
- 600 dpi resolution
- Near-silent printing
- Windows 3.1, 3.11, Windows NT 3.51, Windows NT 4.0 & Windows 95

**£135**

(£158.62 inc VAT)

# OKI

People to People Technology

Lasers



**FREE** All Printers supplied by Dabs Direct include **Printer Cable and Carriage**

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**DOT MATRIX PRINTERS**

EPSON	ex VAT	inc VAT
LX-300	97	113.97
FX-880	247	290.22
FX-1170	200	235.00
FX-1180	307	360.72
FX-2180	465	546.37
DFX-5000	1226	1440.55
DFX-9000	1911	2245.42
DFX-8500	2099	2466.32
LQ-300	115	135.12
LQ-570+	216	253.80
LQ-670	230	270.25
LQ-870	377	442.97
LQ-2070	330	387.75
LQ-2170	468	549.90
DLQ-3000	831	976.42

LEXMARK	ex VAT	inc VAT
2380	285	334.87
2390	285	334.87
2381	349	410.07
2391	349	410.07

OKI	ex VAT	inc VAT
ML280P	195	229.12
ML320P	325	381.87
ML321P	385	452.37
ML380P	230	270.25
ML3320	325	381.87
ML3390	325	381.87
ML3321	385	452.37
ML3391	385	452.37
ML520P	339	398.32
ML521P	415	487.62
ML590P	450	528.75
ML591P	545	640.37
ML395 Mono	655	769.82
ML395 Colour	715	840.12
ML3410	839	985.82

PANASONIC	ex VAT	inc VAT
KX-P1150	95	111.62
KX-P2023	115	135.12
KX-P1131	135	157.45
KX-P3200P	185	217.37
KX-P3626	275	323.12
KX-P3696	275	323.12



**SAMSUNG**  
Laser Printers

**ML6050**  
A fast, sophisticated and compact business laser printer at a personal printer price.

- 12 pages per minute
- 600dpi (1200dpi class)
- HP PCL6 emulation
- 4MB memory
- 250 sheet paper input
- Optional 50 sheet 2nd cassette
- One piece 5k Imaging / Toner cartridge
- EnergyStar compliant and Ozone Free
- Parallel interface

**£259 (£304.32 inc VAT)**

**ML5100A**  
A fast small office or personal printer, easy to install and maintain with low running cost and excellent print quality.

- 8 pages per minute
- 600dpi (1200dpi class)
- HP PCL6 emulation
- 4MB memory
- 150 sheet paper input
- Single sheet feeder - for envelopes, labels and OHPs etc.
- One piece 5k Imaging / Toner cartridge
- EnergyStar compliant and Ozone Free
- Parallel & USB ports

**£199 (£233.82 inc VAT)**

**ML700P/N**  
A robust networkable printer for the busy workgroups offering Duplex as standard.

- 16 ppm (8ppm Duplex), first print in 13 seconds
- 600dpi (1200dpi class)
- PS level II, PCL5e, PCL6 emulation
- 12MB memory (64MB max), 100MHz RISC processor
- 500 sheet paper input & 100 sheet multi-purpose
- Optional 500 sheet 2nd cassette
- One piece 8k Imaging / Toner cartridge
- Optional network cards for Novel, Ethernet 10 Base T/2, TCP/IP and EtherTalk
- Parallel interface, optional RS232c Apple Talk

**£649 (£762.57 inc VAT)**

**ML7000P**  
**£799 (£938.82 inc VAT)**

**SAMSUNG**  
Laser Printers

**DOT MATRIX PRINTERS**

TALLY	ex VAT	inc VAT
MT83	175	205.62
MT84	219	257.32
T2030/9	289	339.57
T2130/9	359	421.82
T2030/24	325	381.87
T2130/24	369	433.57
T2040	565	663.87
T2140	699	821.32
T2055	1049	1232.57
T2070	1229	1444.07

**RIBBONS**

EPSON	ex VAT	inc VAT
7753 80c 24pin Black	4	4.70
7753 136c 24pin Black	5	5.87
7763 LQ-860 Colour	14	16.45
8750 80c 9pin Black	3	3.52
8755P 136c 9pin Black	4	4.70
S015016 LQ-860 Black	6	7.05
S015032 LQ-100 Black	4	4.70
S015047 LX-100 Black	4	4.70
S015060 LQ-150 Black	6	7.05
S015061 LQ-150 Colour	16	18.80
S015066 DLQ-3000 Black	16	18.80
S015067 DLQ-3000 Colour	23	27.02
S015073 LX-300 Colour	16	18.80
S015077 LQ-300 Colour	15	17.62
S015086 FX-2170 Black	6	7.05
S015086 LQ-2170 Black	16	18.80

OKI	ex VAT	inc VAT
1595 ML182/192/280/320/3320	5	5.87
1630 ML-395 Black	17	19.97
1637 ML-395 Colour	23	27.02
2569 ML380/385/366/390/3390	6	7.05
4816 ML-3410 Black	19	22.32
4823 ML590/591 Black	8	9.40
4830 ML590/591 Colour	24	28.20
4837 ML520/521 Black	8	9.40

PANASONIC	ex VAT	inc VAT
KX-P150 KX-P2180/2123/2124 Black	8	9.40
KX-P150C KX-P2180/2123/2124 Colour	14	16.45
KX-P160P KX-P2135 Black	8	9.40
KX-P165C KX-P2135 Colour	14	16.45
KX-P170 KX-P3626/3696 Black	13	15.27
KX-P181 KX-P3200 Black	13	15.27



**HL-820** £159 (£186.82 inc VAT)    **HL-1040** £179 (£210.32 inc VAT)    **HL-1050** £209 (£245.57 inc VAT)    **HL-1070** £275 (£323.12 inc VAT)    **HL-2060** £639 (£750.82 inc VAT)

**HL-820**  
Robust, low cost Windows® only printer. Ideal for the small office or home user.

**FEATURES**

- 8 page per minute
- Windows® dedicated Printing
- 600 dpi resolution
- 2MB standard memory
- 200 sheet paper input
- Semi automatic duplex
- Intelligent sleep mode
- Auto wake up
- Low running costs
- Auto e-mail printing\*

**HL-1040**  
The new HL-1040 is the ideal low cost solution for your printing needs - combining flexibility with high print quality at an affordable price.

**FEATURES**

- 10 page per minute
- Windows/DOS compatible
- 600 dpi print resolution
- 2MB standard memory
- PCL4 compatible
- 200 sheet paper input
- Semi automatic duplex
- Intelligent sleep mode
- Low running costs
- Auto e-mail printing\*
- Network connectivity option

**HL-1050**  
The most highly featured machine in its class. Combining leading edge technology and efficiency for the ultimate in printing efficiency.

**FEATURES**

- 10 pages per minute
- 66MHz RISC processor
- 1200 x 600 dpi printing
- 4MB standard memory expandable to 36Mb
- PCL6 compatible
- Multiple emulations
- 200 sheet paper input
- Semi automatic duplex
- Intelligent sleep mode
- Low running costs
- Auto e-mail printing\*
- IEEE 1284 & Universal Serial Bus interfaces
- Network connectivity option

**HL-1070**  
High quality printing at a surprisingly low price. The Brother HL-1070 makes high quality, high speed and high capacity highly affordable.

**FEATURES**

- 10 page per minute
- 66MHz RISC processor
- 1200dpi resolution
- 4Mb standard memory upgradable to 36Mb
- PCL6 & PostScript 2 language emulation as standard
- In-built barcode font
- Dual paper tray as standard
- 2 x 200 sheet paper input
- Intelligent sleep mode
- Low running costs
- Auto e-mail printing\*
- IEEE 1284 & Universal Serial Bus interfaces
- Network connectivity option
- One year on-site warranty

**HL-2060**  
High volume 20ppm network laser printer.

**FEATURES**

- 20 page per minute
- 100MHz RISC processor
- 8Mb standard memory upgradable to 72Mb
- 1200dpi resolution
- PCL6 & PostScript 2 language emulation as standard
- In-built barcode font
- 500 sheet paper input
- Optional duplex
- Job reprint function
- IEEE 1284 & Universal Serial Bus interfaces
- Optional ethernet interface
- One year on-site warranty

**HL-2400c** £1549 (£1820.07 inc VAT)  
With a resolution of up to 2400dpi the new colour laser from Brother, provides the high quality output demanded by professionals

**FEATURES**

- up to 2400dpi
- up to 8ppm colour/16ppm mono
- 40Mb memory (up to 112Mb)
- Semi automatic manual duplex
- Low running costs
- Automatic e-mail printing
- Intelligent sleep mode
- One year on-site warranty



**HL-2400cn** £1849 (£2172.57 inc VAT)  
The HL-2400cn is a network ready version, having all the features of the HL-2400c, with the addition of...

- 80Mb memory as standard
- Advanced Network Functionality
- 10BaseT & 10Base2 connectors with automatic detection

**HL-2060-16MB** £855 (£769.82 inc VAT)  
**HL2060n** £859 (£1009.32 inc VAT)  
**HL2060n-16MB** £875 (£1028.12 inc VAT)

**HL1070-8MB** £290 (£340.75 inc VAT)  
\*PD\*3 required



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**LASER PRINTERS**

BROTHER	ex VAT	inc VAT
HL-820	159	186.82
HL-1040	179	210.32
HL-1050	209	245.57
HL-1050 8Mb	224	263.20
HL-1070 PostScript	275	323.12
HL-1070 PostScript 8Mb	289	339.57
HL-1660e	579	680.32
HL-1660en Ethernet 8Mb	779	915.32
HL-1660en Ethernet 16Mb	795	934.12
HL-2060	639	750.82
HL-2060 16Mb	655	769.62
HL-2060n Ethernet	859	1009.32
HL-2060n Ethernet 16Mb	875	1028.12
HL-2400c Colour	1549	1820.07
HL-2400cn Colour Ethernet	1849	2172.57
Accessories		
RS-100M HL-730/760/10x0 Serial	75	88.12
NC-600X HL-730/760/1060 Ethernet	185	217.37
LT-1600 HL-1660 500sht Lower Tray	169	198.57
DX-1600 HL-1660 Duplex Unit	329	386.57
NC-1000 HL-1660 Ethernet Interface	219	257.32
LT-24C HL-2400c 250sht Lower Tray	185	217.37
Warranty		
HL-820/1050 1yr OSM	39	45.82
HL-820/1050 2yr OSM	89	104.57
HL-1660 2yr OSM	149	175.07
HL-2400c 2yr OSM	900	1057.50

CANON	ex VAT	inc VAT
LBP-660	185	217.37
LBP-1760	655	769.62

EPSON	ex VAT	inc VAT
EPL-5700	236	277.30
EPL-5700EN Ethernet	373	438.27
EPL-5700PS PostScript	373	438.27
EPL-N1200	477	560.47
EPL-N1200EN Ethernet	636	747.30
EPL-N1200PS PostScript	795	934.12
EPL-N1600	586	700.30
EPL-N1600T Twin Bin	716	841.30
EPL-N1600ENT Ethernet Twin Bin	835	981.12
EPL-N2000	954	1120.95
EPL-N2000PS PostScript	1193	1401.77
EPL-N4000	1944	2284.20
EPL-N4000T	3629	4264.07
EPL-C8000EN	3983	4680.02
EPL-C8000ENT	4663	5479.02
Accessories		
EPL-5700 500sht Lower Cassette	109	128.07
EPL-5700 PostScript SIMM	179	210.32
EPL-N1200 500sht Lower Feeder	149	175.07
EPL-M600 500sht Lower Tray	195	229.12
EPL-M600 Duplex Unit	209	245.57
EPL-N2000 250sht A3 Lower Feeder	225	264.37
EPL-N2000 500sht A4 Lower Feeder	225	264.37
EPL-N2000 Duplex Unit	279	327.82
Type B Ethernet Interface	175	205.62
Type B LocalTalk Interface	89	104.57
Type B Serial Interface	69	81.07
Warranty		
EPL-5700 3yr CoverPlus	59	69.32
EPL-N1200 3yr CoverPlus	175	205.62
EPL-N2000 3yr CoverPlus	275	323.12

HEWLETT PACKARD	ex VAT	inc VAT
Laserjet 1100	232	272.60
Laserjet 1100A Multifunction	285	334.87
Laserjet 2100	423	497.02
Laserjet 2100M	480	564.00
Laserjet 2100TN	600	705.00
Laserjet 4000	741	870.67
Laserjet 4000T Twin Cassette	807	948.22
Laserjet 4000N Ethernet	941	1105.67
Laserjet 4000TN Twin Cassette Ethernet	1011	1187.92
Laserjet 5000 A3	929	1091.57
Laserjet 5000N A3 Ethernet	1379	1620.32
Laserjet 5000GB A3 Ethernet	1701	1998.67
Laserjet 8000 A3	1477	1735.47
Laserjet 8000N A3 Ethernet	1642	1929.35
Laserjet 8000DN A3 Ethernet Duplex	1935	2273.62
Ljet Mopier 240 A3 Ethernet Duplex	2362	2775.35
Laserjet 8100 A3	1687	1982.22
Laserjet 8100N A3 Ethernet	1875	2203.12
Laserjet 8100DN A3 Ethernet Duplex	2145	2520.37
Laserjet Colour 4500	1597	1876.47
Laserjet Colour 4500N Ethernet	1875	2203.12
Laserjet Colour 4500DN Ethernet Duplex	2422	2845.85
Laserjet Colour 8500 A3	3862	4537.85
Laserjet Colour 8500N A3 Ethernet	4425	5199.37
Ljet Colour 8500N A3 Ethernet Duplex	5242	6159.35
Accessories		
LaserJet Companion	85	99.87
LaserJet 4000 500sht Tray	79	92.82
LaserJet 4000 500sht Universal Tray	85	99.87
LaserJet 4000 500sht Feeder	189	222.07
LaserJet 4000 75sht Envelope Feeder	189	222.07
LaserJet 4000 Duplex Unit	209	245.57
LaserJet 5000 250sht Tray	95	111.62

www.tally.co.uk

**Tally**  
to Tally dedicated to printers



Tally T9208 laser printer (shown with optional 2nd sheet tray)

**T9208**

mono laser printer

- 8 pages per minute
- Small and compact
- 600 dpi resolution
- 2MB RAM
- PCL5e emulation
- Microsoft Windows Printing System
- Parallel interface

**T9208 £190** (£223.25)



Tally T9112 laser printer

**T9112 & T9116D**

mono laser printers

- T9112: 12 pages per minute  
250 sheet universal cassette  
75MHz RISC CPU
- T9116D: 16 pages per minute  
550 sheet universal cassette  
125MHz RISC CPU
- Optional Duplex
- 600 x 600 dpi, 4800 x 600 dpi using EET
- 4MB RAM (max 68MB)
- PCL 6 and PCL5e emulation
- Optional Postscript
- Parallel & Serial interfaces

**T9112 £385** (£452.37)

**T9116D £560** (£658.00)

**5% CASHBACK**

Conditions apply, please call for details.  
Cashback directly from manufacturer only

**T8004**

colour laser printer

- 600 x 600 dpi resolution
- 24MB RAM (expandable to 64MB)
- Up to 8 ppm colour, 16 ppm mono
- Parallel and Ethernet interfaces
- Windows 95/98/NT only

**T8004 £1049** (£1232.57)



Tally T8004 colour laser printer

**T8104/plus**

colour laser printers

- T8104: 600 x 600 dpi resolution  
24MB RAM
- T8104 plus: 2400 x 600 dpi resolution  
80MB RAM  
IDE Internal Hard Drive
- Up to 8 ppm colour, 16 ppm mono
- 133 MHz RISC processor
- PostScript Level 2 and PCL5c emulation
- Parallel, Serial & Ethernet interfaces

**T8104 £1469** (£1726.07)

**T8104 plus £1879** (£2207.82)



Tally T8104 colour laser printer

**LASER PRINTERS continued**

HEWLETT PACKARD cont	ex VAT	inc VAT
LaserJet 5000 500sht Tray	125	146.87
LaserJet 5000 250sht Feeder	155	182.12
LaserJet 5000 500sht Feeder	219	257.32
LaserJet 5000 Duplex Unit	309	363.07
LaserJet 8000 Envelope Feeder	285	334.87
LaserJet 8000 2000sht Feeder	585	687.37
LaserJet 8000 2 x 500sht Feeder	585	687.37
LaserJet 8000 7bin Tabletop Mailbox	519	609.82
LaserJet 8000 Multi-bin Mailbox	779	915.32
LaserJet 8000 5bin Mailbox & Stapler	1099	1291.32
Internal EIO		
J3110A JetDirect 600N RJ45	181	212.67
J3111A JetDirect 600N Combo/LocalTalk	216	253.80
J3113A JetDirect 600N 10/100	232	272.60
External		
J2590A JetDirect Plus3 10/100	351	412.42
J2591A JetDirect Plus Combo	186	218.55
J2538A JetDirect 170X	96	112.80
J3263A JetDirect 300X 10/100	186	218.55
J3265A JetDirect 500X 10/100 3 parallel	220	258.50
Memory		
LJ1100/2100/4000 8Mb EDO DIMM	55	64.62
LJ1100/2100/4000 16Mb EDO DIMM	99	116.32
LJ4000/5000/8000 4Mb SDRAM	35	41.12
LJ4000/5000/8000 8Mb SDRAM	65	76.37
LJ4000/5000/8000 16Mb SDRAM	109	128.07
LJ4000/5000/8000 32Mb SDRAM	219	257.32
LJ4000/5000/8000 2Mb Flash RAM	169	198.57
LJ4000/5000/8000 4Mb Flash RAM	229	269.07
Warranty		
LJ6L 3yr Support Pack	77	90.47
LJ6P/6MP 3yr Support Pack	142	166.85
LJ4000 3yr Support Pack	180	211.50
LJ5000 3yr Support Pack	235	276.12
LJ8000 3yr Support Pack	530	622.75
Colour LJ4500 3yr Support Pack	515	605.12

KYOCERA	ex VAT	inc VAT
FS-600	229	269.07
FS-800	299	351.32
FS-800N	479	562.82
FS-1700+	519	609.82
FS-1700T+ Twin Cassette	629	739.07
FS-1700N+ Ethernet	729	856.57
FS-1700TN+ Twin Cassette Ethernet	799	938.82
FS-3700+ PostScript	699	821.32
FS-3700T+ Twin Cassette PostScript	779	915.32
FS-3700N+ Ethernet PostScript	899	1056.32
FS-3700TN+ PostScript Twin Cas Enet	989	1162.07
FS-6700 A3 PostScript	929	1091.57
FS-7000 A3 Twin Cassette	1699	1996.32
FS-7000N A3 Twin Cassette Ethernet	1799	2113.82
FS-1700/FS-3700 Accessories		
ST-20 Face-Down Stacker	639	750.82
HS-20 Face-Up Stacker	99	116.32
PF-7E Bulk Paper Feeder	419	492.32
HS-3E Bulk Output Stacker	419	492.32
EF-1 Power Envelope Feeder	150	176.25
PB-20 Printer Base	115	135.12
PA-20 Paper Path Adaptor	26	30.55
PF-20 Universal Paper Cassette	189	222.07
DU-20 Duplex Unit	359	421.82
PF-5 500 Sheet Feeder	195	229.12
PA-1 Paper Path Adaptor	29	34.07
EF-1 Power Envelope Feeder	149	175.07
FS-7000 Accessories		
PF-30 2x500sht Cassette	379	445.32
DU-30 Duplex Unit	389	457.07
ST-30 Face Up/Face Down Stacker	1469	1726.07
Memory		
4MB SIMM	59	69.32
8MB SIMM	109	128.07
Warranty		
FS-600 1 year	49	57.57
FS-800 1 year	79	92.82
FS-1700 1 year	99	116.32
FS-3700 1 year	199	233.82
FS-5700 1 year	299	351.32

LEXMARK	ex VAT	inc VAT
Optra E+	235	276.12
Optra K1220	459	539.32
Optra S1255	639	750.82
Optra S1255N Ethernet	799	938.82
Optra S1855	709	833.07
Optra S1855N Ethernet	909	1068.07
Optra S2455	1359	1596.82
Optra S2455N Ethernet	1609	1890.57
Optra N A3	1675	1968.12
Optra N Pro A3	1919	2254.82
Optra SC1275 Colour	2245	2637.87
Optra SC1275N Colour	2615	3072.62
Optra 1200 A3 Colour	3949	4640.07
Optra 1200N A3 Colour Ethernet	4579	5380.32
Accessories		
Optra S 250sht Tray	49	57.57
Optra S 500sht Tray	79	92.82
Optra S 250sht Feeder	155	182.12
Optra S 500sht Modular Input	189	222.07

EXCELLENT PRINT QUALITY, AT AN AFFORDABLE PRICE

Lasers



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**LASER PRINTERS continued**

**LEXMARK continued**

	ex VAT	inc VAT
Optra S Envelope Feeder	205	240.87
Optra S Duplex Unit	349	410.07
Optra S 2000sht Feeder	729	856.57
Optra S 650sht Output Stacker	225	264.37
Optra S Cabinet	265	311.37
MarkNet S Triport Adaptor	55	64.62
MarkNet S BNC/RJ45	269	316.07
MarkNet S 10/100 RJ45	325	381.87
Memory		
Optra S 4Mb	65	76.37
Optra S 8Mb	115	135.12
Optra S 16Mb	219	257.32
Warranty		
Optra S 1255 2yr OSM	129	151.57
Optra S 1655 2yr DSM	189	198.57
Optra S 2455 2yr DSM	299	351.32

**MINOLTA**

PagePro 6L	169	198.57
PagePro 6	215	252.62
PagePro 6E	255	299.62
PagePro 8L	205	240.87
PagePro 8	245	287.87
PagePro 8E	319	374.82
PagePro 12	559	656.82
PagePro 20	709	833.07
Colour PagePro	1549	1820.07
Colour PagePro PS	1929	2266.57

**OKI**

DkiPage 4w plus	135	158.62
DkiPage 8p	184	216.20
DkiPage 6e	189	222.07
DkiPage 6ex	219	257.32
DkiPage 10ex	235	276.12
DkiPage 10exs	269	316.07
DkiPage 12i/Ethernet	410	481.75
DkiPage 16n	579	680.32
DkiPage 16nps PostScript	699	821.32
DkiPage 16en Ethernet	749	880.07
DkiPage 16nps Ethernet PostScript	729	856.57
DkiPage 20en Ethernet	889	1044.57
DkiPage 20nps PostScript	899	1056.32
DkiPage 20ndx Duplex	909	1068.07
DkiPage 20enps Ethernet PostScript	1039	1220.82
DkiPage 20ndx Ethernet Duplex	1069	1256.07
DkiPage 8c Colour	1949	2290.07
DkiPage 8cn Colour Ethernet	2379	2795.32

**Accessories**

10i Serial Interface	39	45.82
10i Ethernet Interface	95	111.62
10i PostScript SIMM	109	128.07
20n 2nd/3rd Bin	219	257.32
20n Duplex Unit	235	276.12
20n Fast Ethernet Interface	249	292.57
20n PostScript SIMM	275	323.12

**PANASONIC**

KX-P6300	185	217.37
KX-P6500	249	292.57

**QMS**

DeskLaser 600	159	186.82
DeskLaser 1400P	655	769.62
DeskLaser 2000Net A3 Ethernet	889	1044.57
DeskLaser 2000XNet A3 Duplex Ethernet	1339	1573.32
2060WX	1069	1256.07
2060BX	1329	1561.57
2060GX	1579	1855.32
2060IS	1999	2348.82
2060EX	2669	3136.07
2425PS	2869	3371.07
2425EX	4149	4875.07
MagiColor 2 DeskLaser	999	1173.82
MagiColor 2 CX 24Mb	1595	1874.12
MagiColor 2 CX Exec 80Mb	2039	2395.82

**Accessories**

DeskLaser 1600 MF Feeder	95	111.62
DeskLaser 1600 2nd Feeder	265	311.37
DeskLaser 1600 Duplex Unit	295	346.62
DeskLaser 1600 Serial Interface	109	128.07
DeskLaser 1600 LocalTalk Interface	219	257.32
DeskLaser 1600 Ethernet Interface	289	339.57
2000/2060 250sht Universal Cassette	89	104.57
2000/2060 500sht A4 Cassette	89	104.57
2000/2060 250sht Universal Feeder	219	257.32
2000/2060 500sht A4 Feeder	219	257.32
2000/2060 Duplex Unit	219	257.32
2000/2060 1200dpi Upgrade Kit	559	656.82
2060 Serial Interface	65	76.37
2425 Serial Interface	65	76.37
2060/2425/MagiColor2 Hard Disk	439	515.82
2060/2425/MagiColor2 LocalTalk I/F	235	276.12
2050/2425 MultiPACS Upgrade	1319	1549.82
CrownNet Ethernet Interface	525	616.87
MagiColor 2 Universal Media Cassette	75	88.12
MagiColor 2 Lower Feeder	219	257.32

**TALLY**

T9006	137	160.97
T9208	190	223.25

**It's time your printing costs came down**

All *ECOSYS* printers save you money  
 ECOSYS cartridge-free technology cuts printing cost by avoiding the need to replace the drum and developer, treated as consumables on conventional printers. Kyocera use long-life components instead meaning that printing is significantly cheaper than with cartridge-based printers.

**FS-600 only £229**  
 (£269.07 inc VAT)

- 600 dpi, 6ppm
- 50MHz Power PC processor
- Internal 150-sheet cassette
- Optional 250-sheet cassette
- Ethernet/serial interface options
- Low cost per page - 1p per page 5% and RRP



**FS-800 only £299**  
 (£351.32 inc VAT)

- High performance personal/small workgroup printer
- 8ppm print speed
- 600dpi plus resolution enhancement
- 50MHz Power PC processor
- 4MB RAM, upgradeable to 36MB
- PCL5e & PostScript level 2 emulations
- 150-sheet enclosed paper cassette
- Compact, robust design
- Low cost per page - 1p per page 5% and RRP
- Options include 250-sheet second cassette, network and serial interfaces



**FS-1700+ only £519**  
 (£609.82 inc VAT)

- 12ppm print speed
- 600dpi laser technology (1200dpi KIR2)
- 4MB RAM memory plus memory enhancement
- PCL5e & PostScript level 2 emulations
- 250 sheet standard cassette plus 100 sheet multi-purpose feed
- Advanced modular paper handling options
- SNMP compliant network printer management
- High speed parallel and serial interfaces
- Supports Kyocera PrintMonitor management utility



**FS-3700+ only £699**  
 (£821.32 inc VAT)

- Ideal high performance network printer
- 18ppm print speed
- 600dpi laser technology (1200dpi KIR2)
- 100MHz Power PC processor
- 4MB RAM as standard
- PCL5e and PostScript level 2 emulations
- Advanced modular paper handling options
- SNMP-compliant network printer management
- Ultra-low consumables costs



(see line listing for paper handling options)

**THE SMART MONEY'S ON**



**LASER PRINTERS continued**

**TALLY continued**

	ex VAT	inc VAT
T9112	385	452.37
T9116D	560	658.00
T8004	1049	1232.57
T8104 Colour	1459	1714.32
T8104 Plus Colour	1879	2207.82

**TEKTRONIX**

Phaser 740L Ethernet	995	1169.12
Phaser 740N Ethernet	1395	1639.12
Phaser 740P Ethernet	1995	2344.12
Phaser 740DX Duplex Ethernet	3395	3989.12
Phaser 780N A3 Ethernet	3595	4224.12
Phaser 780GN A3 Ethernet	4695	5516.62
Phaser 780P A3 Ethernet	5395	6399.12

**Accessories**

Phaser 740 Duplex Unit	449	527.57
Phaser Printer Station	325	381.87
Phaser 4.2GB HD	519	609.82
Phaser 740L Colour Upgrade Kit	415	487.62
Phaser 740N to 740P Upgrade	635	746.12
Phaser 780N to 780P Upgrade	1949	2290.07
Phaser 780N to 780GN Upgrade	1109	1303.07
Phaser 780GN to 780P Upgrade	839	985.82
PhaserShare 100baseT Ethernet Card	259	304.32
PhaserShare LocalTalk/Serial Card	169	198.57

**Memory**

Phaser 740/780 16Mb	125	146.87
Phaser 740/780 32Mb	249	292.57
Phaser 740/780 64Mb	499	586.32
Phaser 740/780 128Mb	985	1157.37

**XEROX**

P8e	229	269.07
P12e	410	481.75
4508	265	311.37
4512 Duplex	709	833.07
4512N Duplex Ethernet	789	927.07
4512MP PostScript	995	1169.12
N17B	699	821.32
N17 Ethernet	779	915.32
N24 Ethernet	1629	1914.07
N32 Ethernet	1815	2132.62
N32CN Ethernet Duplex	2849	3347.57
N32FN Duplex Finisher Stapler	4499	5286.32
N40 Ethernet	2029	2384.07
N40CN Ethernet Duplex	3079	3617.82
N40FN Duplex Finisher Stapler	4639	5450.82
DocuPrint C55	1645	1932.87
DocuPrint C55MP PostScript	2199	2583.82
DocuPrint C55MPV PostScript	3085	3624.87

**Accessories**

4508 Serial Interface	75	88.12
4508 250sht Feeder	99	116.32
4512 Apple/Serial Interface	75	88.12
4512 Envelope Feeder	59	69.32
4512 1000sht Feeder	349	410.07
4512 Apple/Serial Interface	75	88.12
4512 Ethernet Interface	245	287.87
N24/32/40 Envelope Feeder	345	405.37
N24/32/40 2500sht Feeder	799	938.82
N24/32/40 Duplex Unit	419	492.32
N24/32/40 Finisher/Stapler	1399	1643.82
N24/32/40 2.1GB HDD	359	421.82
C55 Lower Feeder	439	515.82
C55 Apple/Serial Interface	89	104.57
C55 Ethernet Interface	359	421.82

**Warranty**

4508 2yr OSM	110	129.25
4512 2yr OSM	150	176.25
N24/N32 2yr OSM	530	622.75
C55 2yr OSM	900	1057.50

**SOLID INK PRINTERS**

**TEKTRONIX**

	ex VAT	inc VAT
Phaser 840N Ethernet	1895	2226.62
Phaser 840DP Duplex Ethernet	2695	3166.62
Phaser 840DX Duplex HD Ethernet	3395	3989.12
Consumables		
016160500 Phaser 840 Cyan 5pk	124	145.70
016160600 Phaser 840 Magenta 5pk	124	145.70
016160700 Phaser 840 Yellow 5pk	124	145.70
016158200 Phaser 840 Cyan 2pk	57	66.97
016158300 Phaser 840 Magenta 2pk	57	66.97
016158400 Phaser 840 Yellow 2pk	57	66.97

**PLOTTERS**

**HEWLETT PACKARD**

	ex VAT	inc VAT
DesignJet 430 A1	1120	1316.00
DesignJet 430 A0	1642	1929.35
DesignJet 450C A1	1492	1753.10
DesignJet 450C A0	1942	2281.85
DesignJet 455CA A1	1942	2281.85
DesignJet 455CA A0	2242	2634.35
DesignJet 750C+ A1	3142	3691.85
DesignJet 750C+ A0	3742	4396.85
DesignJet 755CM A0	5017	5894.98
DesignJet 2000CP	5392	6335.60
DesignJet 2500CP	6292	7393.10

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## HP DeskJet and LaserJet printers



### HP LaserJet 1100

The personal laser printer for any size of office.

- Up to 8 ppm print speed
- 600 dpi resolution with Ultra Precise toner
- 2MB memory with MEt
- 100 sheet input tray, straight through paper path
- DOS/Win 3.1x/95/NT 4.0 compatible
- 1 year return to HP warranty

**1100** £232 (€272.60 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)

### HP LaserJet 1100A

The personal laser/copier/scanner with all the features of the LaserJet 1100 plus...

- 600 dpi enhanced/256 greyscale scanner
- Copy documents with a push of a button
- Includes scanning & OCR software

**1100A** £285 (€334.87 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)



### HP LaserJet 2100

The fast, versatile laser printer for business users with growing needs. With its performance, its capability to handle a wide variety of paper types and size and its extensive connectivity it can be shared in small work groups.

- Up to 10 ppm print speed
- 1200 dpi resolution
- PCL6 and PostScript Level 2 emulation (M/TN only)
- 250 sheet input tray, 100 sheet multi-purpose tray
- Win 3.1x/95/NT 4.0/Mac (M/TN only) compatible
- 1 year return to HP warranty

**2100** £423 (€497.02 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)

**2100M** £480 (€564.00 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)

**2100TN** £600 (€705.00 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)



### HP 2000C

The professional consultant that lets you get down to business with breakthrough colour printing speed.

- 10 ppm black, 7 ppm colour
- Full page business graphics: 4 ppm
- Resolution: 600 dpi
- Photo REt II for photo quality colour
- 150 sheet paper tray
- 250 sheet accessory paper tray (2000CN only)
- 2MB RAM
- HP JetDirect 300X print server (2000CN only)
- Win 3.1x, Win 95 & Win NT 4 compatible
- 1 year unit exchange warranty

**2000C** £356 (€418.30 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)

**2000CN** £600 (€705.00 inc VAT)  
With HP SupportPack £Call (€Call inc VAT)



### HP LaserJet 4000

The new standard for network printing.

- Up to 17 ppm engine and 100MHz RISC processor
- 1200 dpi resolution with UltraPrecise Toner
- PCL6 and PostScript Level 2 emulation
- 4MB memory with MEt (8Mb on 4000N/TN)
- 100+500sh input trays (2x 250sh on 4000T/TN)
- Parallel, Serial, Ethernet (4000N/TN only)
- 1 year return to HP warranty

**4000** £741 (€870.67 inc VAT)  
With HP SupportPack £921 (€1082.17 inc VAT)

**4000T** £807 (€948.22 inc VAT)  
With HP SupportPack £987 (€1159.72 inc VAT)

**4000N** £941 (€1105.67 inc VAT)  
With HP SupportPack £1124 (€1320.70 inc VAT)

**4000TN** £1011 (€1187.92 inc VAT)  
With HP SupportPack £1191 (€1399.42 inc VAT)



### HP LaserJet 5000

The A3 network printer for small to medium-sized workgroups.

- Up to 16 ppm engine and 100MHz RISC processor
- 1200 dpi resolution with UltraPrecise Toner
- PCL6 and PostScript Level 2 emulation
- 4MB (8Mb on 5000N, 12Mb & 1Gb HD on 5000GN)
- 350 sheet input (850 sheet on 5000G/GN)
- Parallel, Serial, Ethernet (5000N/GN only)
- 1 year return to HP warranty

**5000** £929 (€1019.57 inc VAT)  
With HP SupportPack £1164 (€136.77 inc VAT)

**5000N** £1379 (€1620.32 inc VAT)  
With HP SupportPack £1614 (€1896.45 inc VAT)

**5000GN** £1701 (€1998.67 inc VAT)  
With HP SupportPack £1936 (€2274.80 inc VAT)



### HP Colour LaserJet 4500

The affordable colour laser printer for corporate workgroups.

- Up to 16 ppm mono, 4 ppm colour
- 600 dpi resolution with Image Ret 2400
- PCL5 and PostScript Level 2 emulation
- SRGB/ColorSmart II & automatic colour calibration
- 32MB (64MB on 4500N/DN)
- 150 + 250 sheet input inputs
- Additional 500 sheet and Duplex on 4500DN
- Parallel, Ethernet (4500N/DN/only)

**4500** £1597 (€1876.47 inc VAT)  
With HP SupportPack £2112 (€2481.60 inc VAT)

**4500N** £1875 (€2203.12 inc VAT)  
With HP SupportPack £2390 (€2808.25 inc VAT)

**4500DN** £2422 (€2845.85 inc VAT)  
With HP SupportPack £2937 (€3450.97 inc VAT)



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*for Home or Office...*



**HP DeskJet 420C**

The affordable friend that makes a great first printer. Ready to handle correspondence and fun projects right out of the box.

- Up to 3 ppm black, 0.25 ppm colour
- Resolution: 600 dpi black, 300 dpi colour
- 50 sheet input tray
- DOS, Win 3.1x, Win 95 compatible
- 1 year unit exchange warranty

**420C**                      **£66** (£77.55 inc VAT)  
 With HP SupportPack                      **£113** (£132.77 inc VAT)



**HP DeskJet 695C**

The smart friend who knows how to deliver.

- Up to 5 ppm mono, 1.7 ppm colour
- Resolution: 600 dpi black, 600 x 300 dpi colour
- DOS, Win 3.1x, Win 95/98 & Win NT 4 compatible
- 1 year unit exchange warranty

**695C**                      **£96** (£112.80 inc VAT)  
 With HP SupportPack                      **£Call** (£Call inc VAT)



**HP DeskJet 880C**

The dynamic partner that handles every job, from business documents to photo printing.

- Up to 8 ppm mono, 5 ppm colour
- 600 dpi resolution
- Photo REt II for photo-quality colour
- Parallel and USB interface
- DOS, Win 3x/9x/NT 5 compatible
- 1 year unit exchange warranty

**880C**                      **£164** (£192.70 inc VAT)  
 With HP SupportPack                      **£Call** (£Call inc VAT)

**HP DeskJet and LaserJet Printers**

Hewlett-Packard offers a wide range of printers designed to suit all needs. HP DeskJet printers can help you express your creativity in as many ways as you can imagine.

Whether you use it at home or in the office, an HP LaserJet printer is a reliable workhorse you can count on day after day.



**HP DeskJet 710C/720C**

The flexible partner that gives you great results with no hassle. Fast and quiet, and prints photos without changing cartridges.

- 6 ppm mono, 3 ppm colour, 0.1 ppm photo (710C)
- 8 ppm mono, 4 ppm colour, 0.3 ppm photo (720C)
- Resolution: 600 dpi black
- Photo REt II for photo-quality colour
- Crisp, quality black text with HP's patented ink
- 100 sheet input tray
- Prints on a wide range of media
- 2MB RAM (710C), 512k RAM (720C)
- Amazingly quiet/compact design
- 1 year unit exchange warranty

**710C**                      **£126** (£148.05 inc VAT)  
 With HP SupportPack                      **£173** (£203.27 inc VAT)

**720C**                      **£141** (£165.67 inc VAT)  
 With HP SupportPack                      **£181** (£212.67 inc VAT)



**HP DeskJet 895Cxi**

The business partner that does wonders for office productivity and handles multiple-users with ease.

- Print Speed: 9 ppm mono, 6 ppm colour  
 3 ppm full page business graphics  
 0.18 ppm photo
- 600 dpi resolution (black)
- Photo REt II for photo-quality colour
- Kodak Image Enhancement
- 100 sheet input tray
- 2MB RAM
- Parallel and USB interface
- DOS, Win 3x/9x/NT 5 compatible
- 1 year unit exchange warranty

**895Cxi**                      **£186** (£218.55 inc VAT)  
 With HP SupportPack                      **£233** (£273.77 inc VAT)

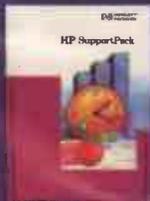


**HP DeskJet 1120C**

The versatile consultant that delivers photo-quality colour prints from postcards to poster.

- Print Speed: 6.5 ppm black (A4), 4.5 ppm colour (A4)  
 4 ppm black (A3), 3 ppm colour (A3)
- Resolution: 600 dpi
- Photo REt II for photo-quality colour
- HP ColorSmart II
- 150 sheet input tray
- 2MB RAM
- DOS, Win 3.1x, Win 95 & Win NT 4 compatible
- Easy setup and installation
- 1 year unit exchange warranty

**1120C**                      **£285** (£290.22 inc VAT)  
 With HP SupportPack                      **£351** (£412.42 inc VAT)



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**LASER CONSUMABLES**

BROTHER		ex VAT	inc VAT
DR-100	HL-630/631/660 Drum	84	98.70
DR-200	HL-730/760 Drum	74	86.95
DR-300	HL-820/1040/50/60/70 Drum	78	91.65
EP-ED	HL-1260/1660 Toner	62	72.85
TN-100	HL-630/631/660 Toner	18	21.15
TN-200	HL-730/760 Toner	13	15.27
TN-300	HL-820/1040/50/60/70 Toner	14	16.45
9832	HL-2400C Black Toner	90	105.75
9833	HL-2400C Cyan Toner	72	84.60
9834	HL-2400C Magenta Toner	72	84.60
9835	HL-2400C Yellow Toner	72	84.60
9837	HL-2400C Fuser	58	68.15
9838	HL-2400C Waste	12	14.10

CANON		ex VAT	inc VAT
EPA	LBP-460/465/660 Toner	30	35.25
EPE	LBP-1260 Toner	54	63.45

EPSON		ex VAT	inc VAT
S050010	EPL-5700 Toner	55	64.62
S051016	EPL-5600 Toner	67	78.72
S051035	EPL-N2000 Toner	114	133.95
S051055	EPL-5700 Drum	42	49.35
S051056	EPL-N1600 Toner	78	91.65

HEWLETT PACKARD		ex VAT	inc VAT
92274A	LJ 4L/4P Toner	43	50.52
92275A	LJ IIP/IMP Toner	52	61.10
92291A	LJ IIS/IAS Toner	69	81.07
92295A	LJ I/II Toner	44	51.70
92298A	LJ 4/4+5 Toner	42	49.35
C3900A	LJ 4V/4MV Toner	85	99.87
C3903A	LJ 5P/5MP/6P/6MP Toner	50	58.75
C3906A	LJ 5L/6L Toner	39	45.82
C3909A	LJ 5S/8000/Mopex 240 Toner	95	111.62
C3964A	Colour LJ5 Coating Kit	30	35.25
C3965A	Colour LJ5 Black Developer	109	128.07
C3966A	Colour LJ5 Colour Developer	314	368.95
C3967A	Colour LJ5 Print Drum	198	232.65
C3968A	Colour LJ5 Transfer Belt	105	123.37
C3969A	Colour LJ5 Fuser Unit	165	193.87
C4092A	LJ 1100 Toner	33	38.77
C4127A	LJ 4000 6k Toner	55	64.62
C4127X	LJ 4000 10k Toner	77	90.47
C4129X	LJ 5000 Toner	93	109.27
C4182X	LJ 8100 Toner	117	137.47
C4191A	LJ 4500 Black	53	62.27
C4192A	LJ 4500 Cyan	67	78.72
C4193A	LJ 4500 Magenta	67	78.72
C4194A	LJ 4500 Yellow	67	78.72
C4195A	LJ 4500 Drum	50	58.75
C4196A	LJ 4500 Transfer Kit	119	139.82
C4198A	LJ 4500 Fuser	138	162.15

KYOCERA		ex VAT	inc VAT
TK-11	FS-400	12	14.10
TK-12	FS-1550/1600/3400/3500/6500	38	44.65
TK-16	FS-600/800 Toner	28	32.90
TK-20	FS-1700/3700 Toner	39	45.82
TK-20G	FS-1700/3700 High Yield	44	51.70
TK-30	FS-7000 Toner	69	81.07
TK-9	FS-1500/3500 Toner	26	30.55

LEXMARK		ex VAT	inc VAT
1361750	Optra SC1275 Photoconductor	74	86.95
1361751	Optra SC1275 Black Toner	40	47.00
1361752	Optra SC1275 Cyan Toner	40	47.00
1361753	Optra SC1275 Magenta Toner	40	47.00
1361754	Optra SC1275 Yellow Toner	40	47.00
1382100	Optra Diamond Fine 7k Toner	112	131.60
1382140	Optra N 15k Toner	138	162.15
1382150	Optra Diamond Fine 15k Toner	152	178.60
6968256	Optra E Toner	39	45.82
1382620	Optra S 7k Toner	129	151.57
1382920	Optra S 7.5k Prebate Toner	99	116.32
1382625	Optra S 17k Toner	154	180.95
1382925	Optra S 17.6k Prebate Toner	124	145.70

OKI		ex VAT	inc VAT
4851	600/6e/6ex/810/Fax Toner	14	16.45
4858	600/6e/6ex/810/Fax Drum	99	116.32
5075	16n Toner	32	37.60
5089	4w/Fax 4100 Toner	13	15.27
5096	4w/Fax 4100 Drum	67	78.72
5115	16n Drum	199	233.82
5122	10i Toner	14	16.45
5129	10i Drum	102	119.85
5136	20n Toner	32	37.60
5143	20n Drum	194	227.95
5150	8c Black	9	10.57
5157	8c Yellow	11	12.92
5164	8c Magenta	11	12.92
5171	8c Cyan	11	12.92

PANASONIC		ex VAT	inc VAT
KX-P459	KX-P6300/6500 Toner	12	14.10
KX-PEP5	KX-P6300/6500 Process Unit	109	128.07
KX-PEP6	KX-P7200 Process Unit/Toner	130	152.75

QMS		ex VAT	inc VAT
1710171-001	2060/DeskLaser 2000 Toner	140	164.50
1710188-001	MagiColor2 Yellow Toner	104	122.20

**LASER CONSUMABLES**

QMS continued		ex VAT	inc VAT
1710188-002	MagiColor2 Magenta Toner	104	122.20
1710188-003	MagiColor2 Cyan Toner	104	122.20
1710188-004	MagiColor2 Black Toner	118	138.65

TALLY		ex VAT	inc VAT
044726	T-9108/9208 Toner/Drum	93	109.27
044787	T-Win Toner 4pk	19	22.32
044876	T-9006	54	63.45
044953	T-8104 Cyan	105	123.37
044954	T-8104 Magenta	105	123.37
044955	T-8104 Yellow	105	123.37
044956	T-8104 Black	105	123.37
044957	T-8104 Drum	242	284.35
044958	T-8104 Fuser Oil & Cleaner	63	74.02
044857	T-9104 Toner 2pk	52	61.10

TEKTRONIX		ex VAT	inc VAT
016168400	Phaser 740 Black 6K Toner	48	56.40
016168500	Phaser 740 Cyan 6K Toner	107	125.72
016168600	Phaser 740 Magenta 6K Toner	107	125.72
016168700	Phaser 740 Yellow 6K Toner	107	125.72
016165600	Phaser 740 Black 12K Toner	77	90.47
016165700	Phaser 740 Cyan 10K Toner	179	210.32
016165800	Phaser 740 Magenta 10K Toner	179	210.32
016165900	Phaser 740 Yellow 10K Toner	179	210.32
016166100	Phaser 740 Fuser	155	182.12
016166300	Phaser 740 Fuser Roll	49	57.57
016166200	Phaser 740 Colour Imaging Kit	149	175.07
016167800	Phaser 780 Black Toner	70	82.25
016167900	Phaser 780 Cyan Toner	126	148.05
016168000	Phaser 780 Magenta Toner	126	148.05
016168100	Phaser 780 Yellow Toner	126	148.05
016168600	Phaser 780 Fuser Roll	49	57.57
016168400	Phaser 780 Colour Imaging Kit	140	164.50

XEROX		ex VAT	inc VAT
101R00090	4512 Drum	94	110.45
106R00088	4512 Toner	90	105.75
113R00184	N24/N32 Toner	204	239.70
113R265	4508 Toner	75	88.12
6R856	C55 Black Toner	13	15.27
8R7724	C55 Fuser Oil	35	41.12
8R7759	C55 Toner Collector	12	14.10
8R857	C55 Cyan Toner	48	56.40
8R858	C55 Magenta Toner	48	56.40
8R859	C55 Yellow Toner	48	56.40

**INKJET PRINTERS**

CANON		ex VAT	inc VAT
BJC-50		192	225.60
BJC-80		142	166.85
BJC-2000		87	102.22
BJC-4400		109	128.07
BJC-4650		197	231.47
BJC-5000		169	198.57
BJC-6000		160	188.00
BJC-5500		409	480.57
BJC-7100		197	231.47

EPSON		ex VAT	inc VAT
Stylus Colour 440		89	104.57
Stylus Colour 640		118	138.65
Stylus Photo 700		133	156.27
Stylus Photo 740		147	172.72
Stylus Photo 750		177	207.97
Stylus Colour 850		207	243.22
Stylus Photo EX		308	361.90
Stylus Photo 1200		295	346.62
Stylus Colour 1520		315	370.12
Stylus Colour 3000		910	1069.25
Stylus Colour Pro 5000		1591	1869.42
800/850 PostScript RIP		89	104.57
3000/5000 PostScript RIP		189	222.07

HEWLETT PACKARD		ex VAT	inc VAT
Deskjet 340C		135	158.62
Deskjet 340CBI		166	195.05
Deskjet 420C		66	77.55
Deskjet 695C		96	112.80
Deskjet 710C		126	148.05
Deskjet 720C		141	165.67
Deskjet 880C		164	192.70
Deskjet 895Cxi		186	218.55
Deskjet 1120C		285	334.87
Deskjet 2000C		356	418.30
Deskjet 2000CN		600	705.00
Deskjet 2500C		705	828.37

LEXMARK		ex VAT	inc VAT
Colour JetPrinter 1100		75	88.12
Colour JetPrinter 3200		112	131.60
Colour JetPrinter 5700		139	163.32
Colour JetPrinter 5700 Photo		155	182.12
Optra Colour 40		289	339.57
Optra Colour 40N		449	527.57
Optra Colour 45 A3		629	739.07
Optra Colour 45N A3		995	1169.12

XEROX		ex VAT	inc VAT
XJ6C		95	111.62
XJ8C		149	175.07

**EPSON**

**FREE!**  
EPSON Colour InkJet with every EPSON Laser!\*

\*Offer subject to availability

**EPSON EPL-5700**



**FREE!**  
Stylus Color 440 inkjet\*  
(offer 1.2.99 - 30/4/99 direct with manufacturer - subject to availability)



- 1200 dpi High Performance Laser Printer**
- 8ppm with 100MHz RISC processor • True 600 x 600dpi
  - 1200dpi with MicroGray 1200 and RiTech
  - 4MB RAM - upgradeable to 36MB
  - Up to 650 sheets capacity with optional paper cassette

**EPL-5700**

**£236**  
(£277.30 inc VAT)

**EPL-5700EN** (Network Ready)

**£373**  
(£438.27 inc VAT)

**EPL-5700PS** (PostScript Ready)

**£373**  
(£438.27 inc VAT)

**EPSON EPL-N1600**



**FREE!**  
Stylus Color 640 inkjet\*  
(offer 1.2.99 - 30/4/99 direct with manufacturer - subject to availability)



**A fast 1200dpi, 6ppm Laser Printer for workgroups or demanding stand alone users**

- Fast print speeds - 16ppm
- Comprehensive network connectivity
- Duplex option available for two-sided printing
- Advanced remote network management & status monitor
- Superb 1200dpi with EPSON MicroGray & RiTech printing tech

**EPL-N1600**

**£596**  
(£700.30 inc VAT)

**EPL-N1600T**

**£716**  
(£841.30 inc VAT)

**EPL-N1600ENT** (Network Ready)

**£835**  
(£981.12 inc VAT)

**Also Available:**

**EPSON EPL-N2000 Series**

**EPL-N2000** (Network Ready)

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Stylus Color 640 inkjet\*  
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**EPL-N2000PS** (PostScript Ready)

**£1193**  
(£1401.77 inc VAT)

**EPSON EPL-N4000 Series**

**EPL-N4000**

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Stylus Color 640 inkjet\*  
(offer 1.2.99 - 30/4/99 direct with manufacturer - subject to availability)

**£1944**  
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**EPL-N4000T**

**£3629**  
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**EPSON EPL-C8000**

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 ECAll (ECAll inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
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**Highest Quality A3+ Photo Printer for Everyday Over Size Printing**

- EPSON Ultra Microdot 6pl™
- 1440 dpi with Variable-Sized droplet technology
- High capacity dual ink cartridges for volume printing
- 1440 dpi PhotoReal printing on plain paper • Paper Roll Option
- EPSON PhotoEnhance 3™ for Instant Image Enhancer
- Parallel, USB, Mac serial interface
- Win 95/98, Win NT 4.0 DOS and Mac compatible
- Enhanced print speed in quality and graphics
- 1 year RTB warranty • PostScript option available

**EPSON STYLUS PHOTO 750**



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 EPSON CoverPlus 3 year RTB extended warranty  
 ECAll (ECAll inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
 £35.00 (£39.32 inc VAT)

**NEW £177**  
 (£207.97 inc VAT)

iMac compatible  
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**Highest Quality Photo Printer for Everyday Printing Needs**

- EPSON Ultra MicroDot™
- 1440 dpi with variable sized droplet technology
- EPSON PhotoEnhance 3 for Optimisation of Digital Images
- Enhanced print speeds for Photo's, graphics and text
- Optimised photo quality • 1440 dpi printing on plain paper
- Parallel, USB, Mac serial, Ethernet interface
- Built-in Parallel and USB ports
- Win 95/98, Win NT 4.0 DOS& Mac compatible • 1 yr RTB warranty as standard

**EPSON STYLUS COLOR 740**



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 EPSON CoverPlus 3 year RTB extended warranty  
 £35.00 (£41.12 inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
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 (£172.72 inc VAT)

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**USB**

**State-of-the-art Colour Inkjet Printer for Advanced Home & Business Users**

- EPSON Ultra Microdot™ - the world's smallest ink droplet in black & colour
- 1440 dpi with variable-sized droplet technology
- Advanced PhotoReal colour printing • Parallel, serial & USB interfaces
- Win 95, 98, NT 4.0 & Mac compatible
- Highest quality output on all media types including plain paper
- Free NEW Advanced 'PerfectPicture Pak' software & paper media bundle

**EPSON STYLUS PHOTO 700**



- Photo reproduction, editing and output up to A4
- Windows 3.1, Windows NT and Mac compatible
- 1440 dpi and Super MicroDot for photo quality
- Epson PhotoEnhance 2 optimises photo output
- Includes Adobe Photo Deluxe V2.0

**NEW**

**EPSON STYLUS COLOR 900**



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 ECAll (ECAll inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
 £39.00 (£39.32 inc VAT)

**£261**  
 (£306.67 inc VAT)

**USB** iMac compatible

**Fastest Colour Inkjet for Stand-Alone, Work Groups & Networked Users**

- Up to 12.6ppm mono and 12.2ppm colour
- EPSON Ultra Microdot™ - the world's smallest ink droplet in black & colour
- 1440 dpi with variable sized droplet technology
- High capacity dual ink cartridges for volume printing
- 1440 dpi printing on plain paper
- EPSON PhotoEnhance 3 for Instant Image Enhancer
- Parallel, USB, Mac serial, Ethernet interface
- Win 3.1 95/98, Win NT 4.0 DOS and Mac compatible
- 1 year RTB warranty

**EPSON STYLUS COLOR 640**



**EPSON COVERPLUS +**  
 EPSON CoverPlus 3 year RTB extended warranty  
 £25.00 (£29.37 inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
 £35.00 (£41.12 inc VAT)



**£118**  
 (£138.65 inc VAT)

**Superior Colour Inkjet Printer for a Broad Range of Home Applications**

- 1440 dpi colour & true black printing with EPSON Super MicroDot™
- Windows 95 & 98 compatibility • Fast print speeds
- High quality output on all media types including plain paper
- EPSON PhotoEnhance 3 for Optimisation for digital images
- Free NEW Advanced 'PerfectPicture Pak' software bundle
- New full function status monitor

**EPSON STYLUS COLOR 440**



**EPSON COVERPLUS +**  
 EPSON CoverPlus 3 year RTB extended warranty  
 £25.00 (£29.37 inc VAT)  
 EPSON CoverPlus 3 year OSM extended warranty  
 £35.00 (£41.12 inc VAT)

**£89**  
 (£104.57 inc VAT)

**A Perfect Introduction to Colour Printing at Home**

- 720 dpi PhotoReal colour & black printing
- Designed for ease of use - ideal for first time buyer • Fast print speeds
- Free NEW Advanced 'PerfectPicture Pak' software bundle
- New full function status monitor • Windows '95 ICM colour compliance

**EPSON STYLUS COLOR 1520**



- 1440dpi print quality up to 6ppm black & 6ppm colour
- A3+ printing • PC and Mac compatible as standard
- 'Look Your Best Color Pack'
- Optional PostScript RIP software
- Optional Network connectivity

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**NEW**

**BJC-2000**

### "The Flexible Colour Printer For The Home Or Office"

- Drop Modulation Technology™, maximises printing quality for colour and photo images
- Image Optimiser technology improves quality of low resolution images
- Colour Image Scanning Cartridge (optional), transforms printer into a full colour A4 sheet-fed image scanner
- Banner Printing Capability gives added flexibility
- Stunning Photographic Output using optional BC-22e Photo cartridge
- Enhanced driver offers superb colour management
- One Year On-Site Warranty

£87 (£102.22 inc VAT)



**NEW**

**BJC-4400Photo**

### "The Affordable Photo Printer For the Home Or Office"

- Photo Quality Desktop Bubble Jet Printer
- Stunning Photographic Output using BC-22e Photo cartridge
- Drop Modulation Technology™, maximises printing quality for colour and photo images
- Image Optimiser technology improves quality of low resolution images
- Colour Image Scanning Cartridge (optional), transforms printer into a full colour A4 sheet-fed image scanner
- Banner Printing Capability gives added flexibility
- Free MGI PhotoSuite™ 2.0 image editing software
- One Year On-Site Warranty

£109 (£128.07 inc VAT)



**NEW**

**BJC-6000**

### "The Cost Effective Business Printer"

- Separate ink tanks enable cost efficient printing
- Rapid 7.4 ppm mono and 5.0 ppm colour output
- Superb resolution - 1440 dpi with Drop Modulation Technology™
- Ink level detection and auto head alignment ensure maintenance free operation
- Manual feed handles A4 + sheets and media up to 550gsm
- Banner Printing Capability gives added flexibility
- One Year On-Site Warranty

£160 (£188.00 inc VAT)



**NEW**

**BJC-7100**

### "The High Performance Colour Printer"

Photograph? Bubble Jet Print? With the BJC-7100 Colour Bubble Jet printer, you really have difficulty telling them apart.

Quality so high, using technology so advanced, means that all your documents will be superbly printed onto any media from everyday plain paper to Canon's Glossy Photo Paper.

- Unprecedented Bubble Jet printing quality
- Rapid 9 ppm mono and 4.8 ppm colour output
- New P-POP technology delivers high quality printed images onto plain paper
- Prints full colour photographs hard to distinguish from the originals
- High capacity ink cartridges
- Incredible flexibility - accepts media from 64 to 550 gsm
- Water-fast printing ensures inks will not run or streak when wet.
- Free MGI PhotoSuite™ 2.0 image editing software
- One Year On-Site Warranty

£197 (£231.47 inc VAT)

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**ORIGINAL INKJET CARTRIDGES**

CANON		ex VAT	inc VAT
BC-01	BJ-10/20 Black	12	14.10
BC-02	BJ-150/200/210/240/250 Black	12	14.10
BC-05	BJC-150/210/240/250 Colour	14	16.45
BC-06	BJC-240/250 PhotoReal	13	15.27
BC-06KIT	BJC-240/250 PhotoReal Kit	19	22.32
BC-10	BJ-30/50/70/80 Black	20	23.50
BC-11	BJC-50/70/80 Colour	23	27.02
BC-20	BJC-4000/5500 Black	18	21.15
BC-21	BJC-4000/5500 Colour	24	28.20
BC-22	BJC-4550/4200/4300 Photo	15	17.62
BC-23	BJC-5000 HiCap Black	19	22.32
BC-22PKIT	BJC-4550/4200/4300 Photo Kit	19	22.32
BC-29F	BJC-4000/5500 Fluorescent	24	28.20
BC-60	BJC-7000 Black	19	22.32
BC-61	BJC-7000 Colour	21	24.67
BC-62	BJC-7000 Photo	29	34.07
BCI-10BK	BJ-30/50/70/80 Black Tank 3pk	9	10.57
BCI-11BK	BJC-50/70/80 Black Tank 3pk	7	8.22
BCI-11C	BJC-50/70/80 Colour Tank 3pk	11	12.92
BCI-21BK	BJC-4000/5500 Black Tank	5	5.87
BCI-21C	BJC-4000/5500 Colour Tank	11	12.92
BCI-61	BJC-7000 Colour Tank	14	16.45
BCI-62	BJC-7000 Photo Tank	19	22.32
BJC-643C	BJC-800 Cyan	15	17.62
BJC-643M	BJC-800 Magenta	15	17.62
BJC-643Y	BJC-800 Yellow	15	17.62
BJI-201BLK	BJC-600/610/620 Black HiCap	5	5.87
BJI-201C	BJC-600/610/620 Cyan	5	5.87
BJI-201M	BJC-600/610/620 Magenta	5	5.87
BJI-201Y	BJC-600/610/620 Yellow	5	5.87
BJI-481	BJ-130 Black	11	12.92
BJI-642	BJ-300/330 Black	8	9.40
BJI-643BK	BJC-800 Black	11	12.92

CITIZEN			
3000055	Printiva Black	4	4.70
3000056	Printiva Cyan	5	5.87
3000057	Printiva Magenta	5	5.87
3000058	Printiva Yellow	5	5.87
3000059	Printiva Gold	10	11.75
3000060	Printiva Silver	10	11.75
3000061	Printiva Red	10	11.75
3000062	Printiva Blue	10	11.75
3000092	Printiva MultiColoured	10	11.75

EPSON			
S020025	Stylus 400/800/1000 Black	7	8.22
S020031	Stylus 300 Black	15	17.62
S020034	Stylus Col/Pro/Pro XL Black	9	10.57
S020036	Stylus Col/Pro/Pro XL Colour	17	19.97
S020047	Stylus 200/820/1115 Black	12	14.10
S020049	Stylus 820/1115/1500 Black	16	18.80
S020062	Stylus 1500 Black	27	31.72
S020066	Stylus Colour Pro XL+ Colour	18	21.15
S020089	Stylus 4/6/800/860/1520 Colour	14	16.45
S020093	Stylus 400/500/600/Photo Black	13	15.27
S020097	Stylus 200/500 Colour	18	21.15
S020108	Stylus 800/850/1520 Black	14	16.45
S020110	Stylus Photo Scolor	12	14.10
S020118	Stylus 3000/5000 Black	32	37.60
S020122	Stylus 3000/5000 Yellow	32	37.60
S020126	Stylus 3000 Magenta	32	37.60
S020130	Stylus 3000 Cyan	32	37.60
S020138	Stylus Colour 300 4colour	13	15.27
S020143	Stylus 5000 Magenta	32	37.60
S020147	Stylus 5000 Cyan	32	37.60
S020187	Stylus 440/640 Black	13	15.27
S020189	Stylus 740 Black	14	16.45
S020191	Stylus 440/640/740 Colour	14	16.45

HEWLETT PACKARD			
51606A	Paintjet XL Black	21	24.67
51606B	Paintjet XL Cyan	22	25.85
51606R	Paintjet XL Magenta	22	25.85
51606Y	Paintjet XL Yellow	22	25.85
51625A	Deskjet 400/5xx Colour	19	22.32
51626A	Deskjet 400/5xx Black	18	21.15
51629A	DJ 600/660/670/690 Black	18	21.15
51633M	DJ Port310/320/340 Black	15	17.62
51640A	DJ 1200C/650/2x0/3x0 Black	18	21.15
51640C	DJ 1200C/1600C Cyan	19	22.32
51640M	DJ 1200C/1600C Magenta	19	22.32
51640Y	DJ 1200C/1600C Yellow	19	22.32
51641A	DJ 820/870/1100 Colour	18	21.15
51645A	DJ 710/720/8x0/1100/1600 Blk	18	21.15
51649A	DJ 600/660/670/690 Colour	18	21.15
C1816A	DJ 690 Photo	20	23.50
C1823A	DJ 710/720/890/895 Colour	22	25.85
C4584A	DJ 690 Photo Kit	32	37.60
C4841A	DJ 2000/2500 No.10 Cyan	22	25.85
C4842A	DJ 2000/2500 No.10 Magenta	22	25.85
C4843A	DJ 2000/2500 No.10 Yellow	22	25.85
C4844A	DJ 2000/2500 No.10 Black	22	25.85

LEXMARK			
12A1970	ColourJet 7000/7200 Black	19	22.32
12A1980	ColourJet 7000/7200 Colour	22	25.85
12A1990	ColourJet 5700 Photo	27	31.72
13A00HC	ColJet 1000/1020/2050 Black	19	22.32
1380490	4079 Black	15	17.62

**Tektronix**

**Phaser 740L**

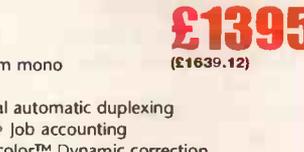
- Colour capable laser
- 16MB, 16ppm, 1200x1200dpi
- Adobe Postscript 3, PCL5 emulation
- Optional automatic duplexing
- Ethernet & parallel interface
- 1 year RTB warranty



**£995**  
(£1169.12)

**Phaser 740N**

- Colour laser • 32MB, 5ppm col, 16ppm mono
- 600 dpi colour, 1200 dpi mono
- Ethernet & parallel interface • Optional automatic duplexing
- Adobe Postscript 3, PCL5c emulation • Job accounting
- Usage profile • Remote printing • Tekcolor™ Dynamic correction
- 1 yr Tekcolor™ on-site warranty



**£1395**  
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**Phaser 740P, 740DP & 740DX**

- Colour laser
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- Usage profile • Job accounting
- Collation printing • Remote printing
- Tekcolor™ Dynamic correction • 1 yr Tekcolor™ on-site warranty

**Phaser740P**  
**£1995** (£2349.12)

**Phaser740DP**  
**£2569** (£3118.57)

**Phaser740DX**  
**£3395** (£3989.12)

Consumables				
Colour upgrade kit for 740L	£415	(£487.62)	Magenta toner cartridge	£107 (€125.72)
Black toner cartridge	£48	(£56.40)	Yellow toner cartridge	£107 (€125.72)
Cyan toner cartridge	£107	(€125.72)	4 toner cartridges, 50 trannies, 100 sh paper	£481 (€565.17)

PRICES IN BRACKETS ARE INCLUSIVE OF VAT See line listing for Phaser 840 & 780

**ORIGINAL INKJET CARTRIDGES**

LEXMARK continued		ex VAT	inc VAT
1380491	4079 Cyan	22	25.85
1380492	4079 Magenta	22	25.85
1380493	4079 Yellow	22	25.85
1380619	ColJet 1000/1020/2050 Colour	23	27.02
1382050	ColourJet 2070 Black	24	28.20
1382060	ColourJet 2070 Colour	27	31.72

**STATIONERY**

CANON		ex VAT	inc VAT
BF-102 A4	A4 Back Print 20sht	28	32.90
BF-102 A3	A3 Back Print 20sht	46	54.05
CF-102 A4	A4 Transp 50sht	29	34.07
DF-102 A4	A4 Back Print 20sht	28	32.90
FS-101 A4	A4 Fabric 10sht	33	38.77
GP-201 A4	A4 Glossy 20sht	6	7.05
HG-101 A3	A3 High Gloss 20sht	33	38.77
HG-101 A4	A4 Glossy Film 20sht	17	19.97
HR-101 A3	A3 Coated 720dpi 100sht	18	21.15
HR-101 A4	A4 Coated 720dpi 200sht	18	21.15
LC-101 A3	A3 Coated 200sht	37	43.47
LC-101 A4	A4 Coated 200sht	19	22.32
LC-301 A3	BJC-4550 A3 Coated 200sht	21	24.67
TR 201	Transfer Material 10sht	12	14.10

EPSON			
S041054	A6 Photo Index Card 50sht	6	7.05
S041059	A4 360dpi 100sht	6	7.05
S041061	A4 Photo 1440dpi 100sht	8	9.40
S041063	A4 Transp 360dpi 30sht	32	37.60
S041065	A3 360dpi 100sht	19	22.32
S041066	A3+ 360dpi 100sht	21	24.67
S041068	A3 Photo 1440dpi 100sht	26	30.55
S041069	A3+ Photo 1440dpi 100sht	30	35.25
S041071	A4 Photo Glossy 1440dpi 15sht	22	25.85
S041073	A3 Photo Glossy 1440dpi 10sht	39	45.82
S041074	A3+ Photo Glossy 1440dpi 10sht	49	57.57
S041078	A2 360dpi 30sht	19	22.32
S041079	A2 Photo 1440dpi 30sht	24	28.20
S041102	Banner 15m 1440dpi	24	28.20
S041106	A4 Photo Self-Adhesive 10sht	8	9.40
S041107	A6 Photo Glossy Film 10sht	4	4.70
S041121	A5 Photo 30sht	5	5.87
S041121	5" x 8" Photo Card	5	5.87
S041122	8" x 10" Photo Card	12	14.10
S041123	A2 Photo Glossy	33	38.77
S041125	A3 Photo Glossy	17	19.97
S041126	A4 Photo Glossy	6	7.05
S041130	A2 Backlit Film 10sht	49	57.57
S041131	A3 Backlit Film 10sht	30	35.25
S041132	Stylus 3000 Canvas Cloth	38	44.65
S041133	A3+ Photo Glossy	20	23.50
S041134	A6 Photo 20sht	5	5.87
S041140	A4 Photo Glossy 20sht	8	9.40
S041142	A3 Photo Glossy 20sht	18	21.15
S041143	A3+ Photo Glossy 20sht	22	25.85
S041144	A6 Photo Sticker Sht	5	5.87
S041145	Panoramic Photo Glossy 10sht	10	11.75
S051031	Stylus A4 Starter Pack	15	17.62
SE41001	A4 Iron on Transfer 10sht	10	11.75
SE41003	A3 Iron on Transfer 10sht	72	84.60

HEWLETT PACKARD			
51634Z	Premium A4 200sht	12	14.10
C1821A	Banner A4 100sht	8	9.40
C1825A	Bright White A4 500sht	9	10.57
C1847A	DJ 690C Photo	7	8.22
C1856A	Premium A3 100sht	18	21.15
C1858A	Bright White A3 200sht	16	18.80
C3831A	Premium Glossy A4 10sht	6	7.05
C3832A	Premium Transp A4 20sht	14	16.45
C3835M	Premium Transp A4 50sht	32	37.60
C3837A	Premium Glossy A4 50sht	30	35.25
C5987A	Glossy Photo 20sht	4	4.70
C6027A	DesignJet 24"x150" Roll A1	29	34.07
C6028A	DesignJet 36"x150" Roll A0	39	45.82
C6040A	Premium Photo A4 15sht	6	7.05
C6057A	Premium Deluxe Photo 20sht	10	11.75
C6059A	Premium Photo A3 20sht	23	27.02

LEXMARK			
1372081	A4 Coated 200sht	27	31.72
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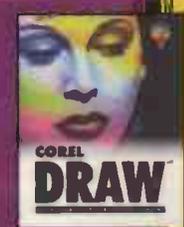
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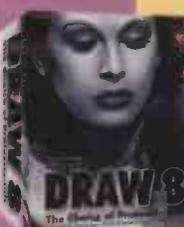
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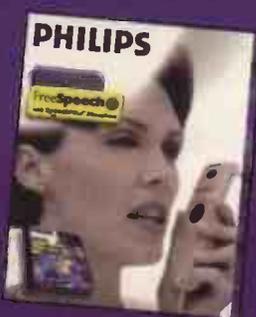
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Welcome to the March Edition.

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## PalmPilot

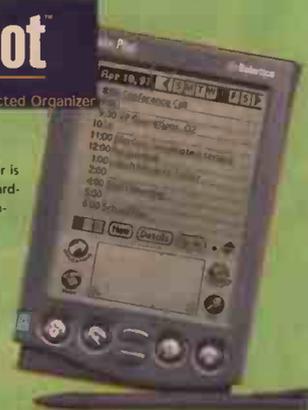
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5

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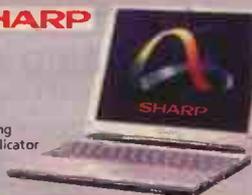


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IBM307	Pentium II/400MHz	32Mb/384Mb	3.2Gb/(Ultra ATA with S.M.A.R.T.)	£1180.88 inc. VAT £1005 ex. VAT
IBM308	Pentium II/450MHz	64Mb/384Mb	6.4Gb/(Ultra ATA with S.M.A.R.T.)	£1432.33 inc. VAT £1219 ex. VAT

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SHA017	Sharp GC-4600	INC VAT £492 <sup>33</sup>	EX VAT £419
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- Three year international warranty



TOS162	Tecra 8000 PII / 233 / STN	INC VAT £1148 <sup>00</sup>	EX VAT £1349
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- Windows 98

Stock Code	Processor	RAM (Std/Max)	Hard Disk	Display	Price
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IBM280	Mobile Pentium II/233MHz	32Mb/256Mb	3.2Gb	12.1" 800x600 TFT - active matrix	£1351.19 inc. VAT £1149.95 ex. VAT
IBM281	Mobile Pentium II/266MHz	64Mb/256Mb	4.3Gb	14.1" 1024x768 TFT - active matrix	£2090.33 inc. VAT £1779 ex. VAT

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ACE002	TruMat 312T	PII300MHz	16MB/128MB	3.2GB	20x Max	12.1" TFT	£1173.83	£999
ACE003	TruMat 312T	PII300MHz	32MB/128MB	4.0GB	20x Max	12.1" TFT	£1291.33	£1099
ACE061	TruMat 720T	PII300MHz	64MB/256MB	5.0GB	24x Max	14.1" TFT	£2112.00	£1849
ACE062	TruMat 722T	PII300MHz	64MB/256MB	10.0GB	2x DVD	14.1" TFT	£2499.00	£2149



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RAM	32MB SDRAM	64MB SDRAM	64MB SDRAM	64MB SDRAM	64MB SDRAM
Hard Disk (UDMA)	4.3GB	6.4GB	6.4GB	6.4GB	6.4GB
CD-ROM	none	32 speed	32 speed	32 speed	32 speed
Display adapter	ATI 3D Charger	ATI 3D Xpert98 x2			
Video Memory	4MB AGP	8MB AGP	8MB AGP	8MB AGP	8MB AGP
Bundled Software	MS Word 97	MS Word 97	MS Word 97	MS Word 97	MS Word 97
Operating System	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98
Bundled Software	MS Works 4.0	MS Works 4.0	MS Works 4.0	MS Works 4.0	MS Works 4.0
Price Ex. VAT	<b>£449.00</b>	<b>£649.00</b>	<b>£669.00</b>	<b>£749.00</b>	<b>£849.00</b>
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- 4 in 1 PC Card modem 56 Kbps, GSM data, ISDN, Ethernet ready.
- Microsoft Windows 98, plus special Sony Software and recovery CD
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- 84 keys, 12 function keys, hot keys & touch pad

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- Same as 505FX but without CD ROM drive and 4 in 1 PC card modem



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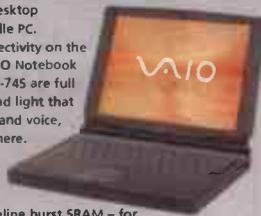
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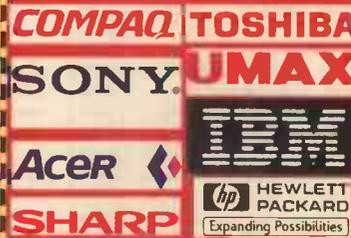
- Intel Pentium 266 MHz processor, with MMX Technology - for swift data processing
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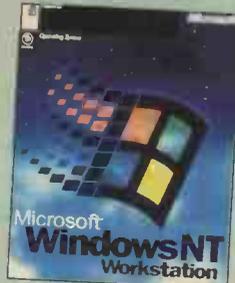
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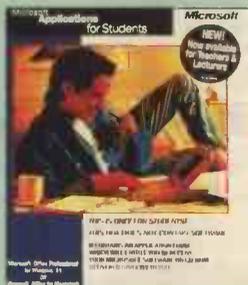
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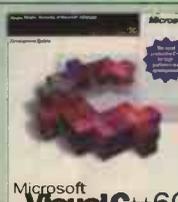
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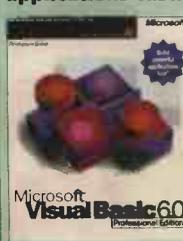
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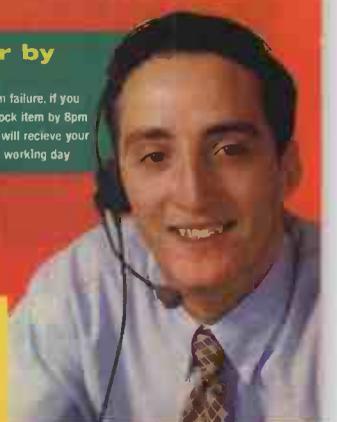
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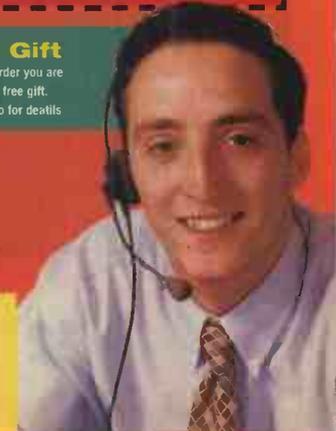
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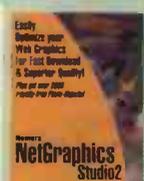
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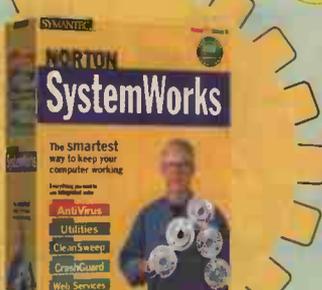


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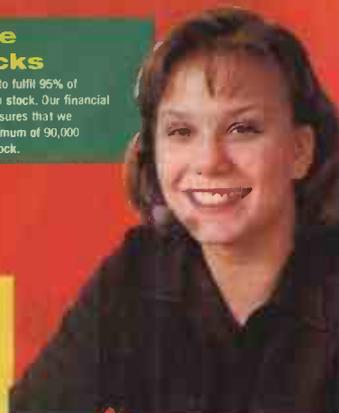
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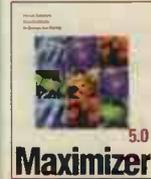


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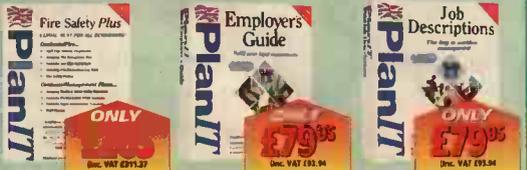
USE ZIP FILES WITHOUT UNZIPPING THEM FIRST!!

The highest-rated zip utility just got web and email enabled! With patent pending technology, ZipMagic 98 actually lets you use zip files without unzipping them, so you can open, modify, launch, and save your compressed files and applications as if they were never zipped! And, it now includes exclusive internet features to turbo-charge email file transfers, and download and install software right from within your browser.



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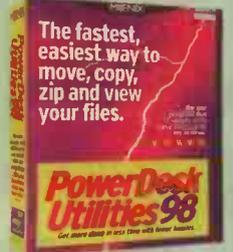


CRO019 Modem Wizard 4.0.....incVAT **£24<sup>37</sup>** EXVAT **£21<sup>25</sup>**

## PowerDesk Utilities 98

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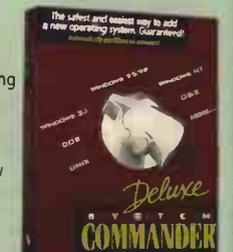
Partition Commander makes it easy to partition your hard drive. You can reclaim wasted disk space, organise files, add new operating systems (Oses), and in many cases speed up drive access. And you don't have to be an expert. Partition commander automates the process - guiding you through step-by-step. Where you have a choice, helpful suggestions are made available - the rest is handled automatically.



VCO001 Partition Commander.....incVAT **£34<sup>98</sup>** EXVAT **£29**

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<b>Total Virus Defense DOS/ Win 3X/ Win 95/ Win NT/ OS2</b>				
SOL199	Anti-virus Toolkit 5 node TVD Licence Pack	1 year	£264.38	£225.00
SOL200	Anti-virus Toolkit 10 node TVD Licence Pack	1 year	£499.38	£425.00
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LAH002 VOICE XPRESSPLUS	£68.08	£79.99
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<b>Corel</b>		
COR612 COREL WP PRO SUITE V8 UG	£130.00	£152.75
COR619 COREL WP 8 UG+DRAGON NS	£74.99	£88.11
<b>Lotus</b>		
LOT300 LOTUS WORDPRO 97	£39.95	£46.94
LOT326 "LOTUS WORDPRO 97 3.5" 3.1"	£39.95	£46.94
<b>Microsoft</b>		
MIC646 MS WORD 97 CUJ UPGRADE CD	£69.95	£82.19
MIC942 MS PROOF/TOOL 97 SPANISH	£71.76	£84.32
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DATA BECKER SOFTWARE



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IncVAT £39.99 EVAT £34.93



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Everything you need for creating an emmersive website in one box.

LIV002 realitystudio  
IncVAT £93.94 EVAT £79.95



## LOONEY TUNES PHOTO PRINT STUDIO

Create fun Photo projects featuring the LOONEY TUNES.

LIV005 Photo print studio  
IncVAT £24.99 EVAT £21.27



## CONSUMABLES

We Stock all consumables for all major printer manufacturers at guaranteed LOW PRICES

LEXMARK OKI HEWLETT PACKARD brother

EPSON XEROX KYOCERA



## PAPER

Print & Go is a revolutionary new range of papers, designed to produce Professional quality gloss prints from your colour inkjet printer. The unique surface coating absorbs ink instantly to give impressive performance combined with the ease of use:

- KEY FEATURES
- Instant drying
  - Easy to load
  - Scratchproof
  - Waterproof



Laser/Copier Range Paper	Quantity	Price (ex VAT)	Price (inc VAT)
TRP005 A4 Premium Quality	250s	£6.45	£5.49
TRP006 A4 Digital Coated Laser Paper	250s	£8.21	£6.99
TRP007 A4 High Quality White	500s	£8.21	£6.99
TRP008 A4 Pastel Multicoloured Pack	250s	£6.45	£5.49
TRP031 A4 Deep Multicoloured Pack	250s	£8.21	£6.99
TRP032 A4 Assorted single colours pastel	100s	£4.69	£3.99
TRP033 A4 Assorted single colours deep	100s	£4.69	£3.99
<b>Laser/Copier Range Labels</b>			
TRP020 A4 8 per sheet die cut	40s	£9.39	£7.99
TRP021 A4 14 per sheet die cut	40s	£9.39	£7.99
TRP022 A4 16 per sheet die cut	40s	£9.39	£7.99
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<b>Laser/Copier Range Films</b>			
TRP024 A4 Plain	25s	£6.45	£5.49
TRP017 A4 Paperbacked long edge	25s	£6.45	£5.49
TRP018 A4 Paperback short edge	25s	£6.45	£5.49
TRP019 A4 Removable stripe	25s	£6.45	£5.49
<b>Transparencies / films</b>			
TRP028 A4 Universal removable stripe short edge	25s	£11.74	£9.99
<b>Inkjet Range Paper</b>			
TRP019 A4 Mono Inkjet Paper	200s	£8.21	£6.99
TRP020 A4 Colour Inkjet Paper	200s	£8.21	£6.99
TRP011 A4 Ultra White Inkjet Paper	500s	£11.74	£9.99

## PLANET'S NETWORK IN A BOX FROM £69



Features

- 1x8 port 10Base-T Hub with 1 BNC
- 3x10 Base-T cards (Plug 'n Play)
- 3x5meter RJ45 patch leads
- Both PCI and ISA versions available

PLA062 Network Starter Kit ISA  
IncVAT £81.04 EVAT £69

PLA063 Network Starter Kit PCI  
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**Lowest priced hubs in the UK**  
FROM £69 (inc VAT)

BEL125 IEEE 1284 Printer 1.8m (Gold)	IncVAT £17.91	EVAT £14.99
BEL126 IEEE 1284 Printer 3m (Gold)	IncVAT £19.96	EVAT £16.99
BEL025 IEEE 1284 A-B Parallel Printer 1.8m	IncVAT £14.99	EVAT £11.99
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# SOFTWARE WAREHOUSE

LOW PRICE INDEX  
PERIPHERALS

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## THE UK'S NO.1 FOR HP PRINTERS



### DeskJet 420C

The most affordable first time printer.



**ONLY £66**  
(Inc. VAT £77.55)  
Stock code HWP457

### DeskJet 695C

- Up to 5ppm/black
- Up to 1.7ppm/colour
- 600 x 600 dpi black
- 600 x 300 dpi colour
- RealLife Imaging System



**NOW £96**  
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### DeskJet 720C

Looking for a business printer that gives you sharper, realistic colour for everything you print?



**JUST £141**  
(Inc. VAT £165.68)  
Stock code HWP332

### DeskJet 895CXI

- KEY FEATURES
- Photo quality printing on a wide range of media with improved HP PhotoREt II
  - Sharp, crisp text with HP pigment black ink



**ONLY £186**  
(Inc. VAT £218.55)  
Stock code HWP553

### OfficeJet 635

All-in-One - Print, Copy, Scan in Colour - Fax



**ONLY £296**  
(Inc. VAT £347.80)  
Stock code HWP347

### LaserJet 3100

The personal LaserJet All-in-One that effectively delivers professional documents for business communications



**ONLY £489**  
(Inc. VAT £578.57)  
Stock code HWP350

### HP LaserJet 2100



**FROM £99**  
(Inc. VAT £118.83)  
Stock code HWP126

HWP525 HP Colour LaserJet 4500 **INC VAT £1876.48** **EX VAT £1597**

HWP356 HP DeskJet 1120c (A3) **INC VAT £334.88** **EX VAT £285**

HWP314 HP LaserJet 4000 **INC VAT £870.68** **EX VAT £741**

HWP351 HP LaserJet 5000 **INC VAT £1135.05** **EX VAT £1008**

FOR MORE INFORMATION SEE OUR WEB SITE AT:  
[www.software-warehouse.co.uk/hp](http://www.software-warehouse.co.uk/hp)

### DeskJet 880C

Fast results for enhanced productivity. With speeds of up to 8 pages per minute for black and 5 pages per minute for color, the HP DeskJet 880C color printer will keep up with your demanding workload.



**ONLY £154**  
(Inc. VAT £206.80)  
Stock code HWP332

HWP458 HP DeskJet 710C **INC VAT £148.95** **EX VAT £126**

### OfficeJet 700

The HP All-in-One product that makes it easy to do your work and communicate in colour.

- Colour printer, colour fax, colour scanner, colour copier
- Photo-quality printing with HP PhotoREt
- Colour faxing for the first time in an HP All-in-One!
- Easy scan and edit documents and photos
- Edit scanned documents and forms using OCR software



**ONLY £232**  
(Inc. VAT £279.53)  
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### LaserJet 1100/A

Quickly print professional-looking documents at your desk

- Produce output at a fast 8ppm
- Deliver professional results with true 600dpi laser, HP Resolution Enhanced technology (REt) and HP UltraPrecise toner cartridge
- Advance your desktop possibilities and efficiency
- Add tools to your desktop with copier/scanner attachment



**JUST £232**  
(Inc. VAT £272.60)  
Stock code HWP521

HWP522 HP LaserJet 1100A-scanner **INC VAT £334.9\*** **EX VAT £285**

### HP 2000C/CN

The professional consultant that lets you get down to business with breakthrough colour print speed.

- KEY FEATURES
- Up to 10ppm mono
  - 4 high capacity ink cartridges and 4 long-life printheads
  - Ink level indicator
  - HP 2000CN version: includes HP 2000C printer, HP JetDirect 300X print server and 250 sheet accessory paper tray



Up to 5 times faster than 690C  
**NEW LOW PRICE £240**  
THIS PRICE HAS JUST DROPPED!  
**£240**

HWP456 HP 2000CN **£Call**

### HP 2500C

Professional Series Colour Printer

- KEY FEATURES
- Stunning cost savings & speed gains with HP's new Modular Ink Delivery System and Smart Printing Technology
  - Brilliant photo quality colour with HP PhotoREt II up to A3 oversize)



**ONLY £705**  
(Inc. VAT £828.38)  
Stock code HWP480

### OKIPAGE 4w Plus

Ideal for small businesses or specialist home users who need quality printing and for whom space is at a premium.

- Features
- 4 pages per minute LED page printer
  - True 600 dpi resolution
  - 100 sheet autofeeder
  - Small footprint - smaller than A4
  - Hiper W - Oki's high performance driver for Windows



**NOW £135**  
(Inc. VAT £158.62)  
Stock code OKI021

### OKIPAGE 8p

Fast, crisp printing to suit your business needs.

- Features
- 8 pages per minute LED page printer
  - 600 x 1200 dpi resolution
  - 2Mb RAM upgradable to 6Mb
  - DOS, Windows 3.1/95/98 & Windows NT4.0 compatible



**NEW**  
**NOW £184**  
(Inc. VAT £217.28)  
Stock code OKI022

### OKIPAGE 10ex

This is an ideal personal page printer, especially good for mail merges and presentations.

- Features
- 10 pages per minute LED page printer
  - 600 x 1200 dpi resolution
  - 250 sheet autofeeder
  - 4Mb RAM, upgradable to 35Mb
  - PCL6, IBM Proprinter IIIXL & Epson FX SIDM emulations
  - DOS, Windows 3.1/95/98 & Windows NT4.0 compatible



**NEW**  
**NOW £239**  
(Inc. VAT £280.83)  
Stock code OKI050

### OKIPAGE 12i/n

The professional solution for desktop and networking printing.

- Features
- 12 pages per minute LED page printer
  - 600 x 1200 dpi resolution
  - 4Mb RAM, upgradable to 36 Mb
  - PCL6 and Adobe Postscript Level II
  - Ethernet 10 Base T as standard
  - DOS, Windows 3.1/95/98 & Windows NT 4.0



**NEW**  
**NOW £410**  
(Inc. VAT £481.75)  
Stock code OKI062

OKI061 OKIPAGE 10exs **INC VAT £316.00** **EX VAT £269**

FOR MORE INFORMATION SEE OUR WEB SITE AT:  
[www.software-warehouse.co.uk/oki](http://www.software-warehouse.co.uk/oki)

## PRINTER CONSUMABLES

	EX VAT	INC VAT
<b>Epson</b>		
EPS183 PHOTO PAPER (4"x6") 20 SH	£4.00	£4.70
EPS184 A2 PHOTO QUAL GLOSS 20SHT	£25.00	£29.38
EPS190 8x10" PHOTO QUAL CARD 30"	£10.00	£11.75
EPS198 PHOTO QUAL BANNER 15M	£17.00	£19.98
EPS199 EPSON CANVAS CLDTH ROLL	£30.00	£35.25
EPS224 A3 PHOTO QUAL GLOSSY 20 S	£14.00	£16.45
EPS281 A4 PHOTO PAPER (20 SHTS)	£6.00	£7.05

	EX VAT	INC VAT
<b>Fuji</b>		
FUJ007 FUJI NC-3D PAPER 400 SHEE	£136.00	£159.80
FUJ010 FUJI NC-3D 20 SHEET PAPER	£8.00	£9.40

HP Compatible - Generic		
HEA010 720DPI A4 MATT 20 PHOTOPL	£2.00	£2.35
HEA012 1440DPI PRO A4 INKJET 20	£2.00	£2.35
HEA013 1440DPI PRD A4 INKJET 20	£5.00	£5.88
HEA014 PRESENTATION WHIT 100g 50	£1.00	£1.18
HEA015 PRESENTATION WHIT 100g 20	£1.00	£1.18
HEA016 PHOTO PLUS GLOSSY	£5.00	£5.88
HEA017 TOPCOPY CARD WHITE	£1.00	£1.18
HEA018 T-SHIRT TRANSFER A4	£5.00	£5.88
HEA020 RAINBOW TINTS NATURAL 5	£3.00	£3.53
HEA021 RAINBOW TINTS VIVIO 5PK	£3.00	£3.53
HEA022 A4 360DPI INKJET 250PK	£3.00	£3.53

Hewlett-Packard		
HWP015 HP 820/50/70/90 1600 BLK	£17.00	£19.98
HWP018 HEW/PACK 1600 CYAN/COLOUR	£18.00	£21.15
HWP019 HEW/PACK 1600 YELLOW/CART	£18.00	£21.15
HWP030 HP SUP/DSKJET/WRIT660/850	£59.00	£69.33
HWP044 HP DESIGNJET 650C CYAN	£22.00	£25.85
HWP047 HP 55I TONER CARTRIDGE	£92.00	£108.10
HWP050 HP 5L/6L/3100 TONER CART	£32.00	£37.60
HWP051 HP 5P/MP 6P/MP LASERTONER	£42.00	£49.35
HWP052 HP TONER CART II-D/III-D	£42.00	£49.35
HWP053 HP LJ TONER II/III/IV	£49.00	£57.58
HWP054 HP 4V/4M TONER CART	£80.00	£94.00
HWP055 HP TONER CART IIS/IS/ASI	£63.00	£74.03
HWP056 HP TONER CART 4/M 5/M 6/M	£47.00	£55.23
HWP057 HP TONER 4L/4ML/4P/4MP	£40.00	£47.00
HWP061 HP COL CART 870/820CXI	£18.00	£21.15
HWP062 HP 500/400L DJ BLK CART	£17.00	£19.98
HWP063 HP 340/400/5XX COLOR CART	£18.00	£22.33
HWP069 DESKJET 310/320/340 BLK	£15.00	£17.63
HWP070 HP LJ 8500 BLACK TONER	£60.00	£70.50
HWP084 HP 1600 MAGENTA CARTRIDGE	£17.00	£19.98
HWP087 BATTERY FOR HP340 PRINTER	£23.00	£27.03
HWP091 DUPLEX FOR HP LASERJET/SSI	£331.00	£388.93
HWP095 HP 340 INFRARED ADAPTOR	£25.00	£29.38
HWP096 HP 340 CARRY CASE	£41.00	£48.18
HWP097 HP 340 L/P PARALLEL CABLE	£9.00	£10.58
HWP098 HP COPY/DESIGNJET BLK CTR	£17.00	£19.98
HWP099 HP 600 SERIES BLK INK CAR	£17.00	£19.98

FREE\* £129.98 worth of software with every printer

• PhotoStudio V.2.0 RRP £79.99  
• PhotoFantasy 1.5 and PhotoPrinter 1.0 RRP £49.99

**FREE £129 worth of software**

Introducing all your favorite photos on one page

Packshots for illustration purposes only. \*Only valid when printer purchased with a cable and cartridge

### Order by 8pm

Barring system failure, if you order an in-stock item by 8pm (Mon-Fri) you will receive your order the next working day

Freephone 0800 0355 355

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\*Next-day delivery from £6.95 E&OE. All prices exclude delivery, see page 31 for terms and conditions

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**PRINTERS & CONSUMABLES**

	EX VAT	INC VAT
<b>Canon</b>		
CAN078 A4 SHEET FEEDER CAN-5500	£79.00	£92.83
CAN079 PHOTO CART FOR BJC-7000	£28.00	£32.90
CAN081 3YR ONSITE WRNTY 4000rang	£67.00	£78.73
CAN087 BJC-4300 COLOUR INK CART	£25.00	£29.38
CAN088 CANON BAT PACK BJC80	£65.00	£76.38
CAN090 CANON BJC4650 3YRS ONSITE	£67.00	£78.73
CAN092 CANON BJC-4650 SCANNER CA	£65.00	£76.38
CAN094 BJC70/80 3 COLOUR CART	£22.00	£25.85
CAN095 SECOND A4 ASF BJC-5500	£64.00	£75.20
CAN107 CANON BJC-50 SCAN CARTRDI	£73.00	£85.78
<b>Epson</b>		
EPS019 EPSON STYLUS COLOUR KIT	£29.00	£34.08
EPS036 STYLUS 820/1115/2000 BLK	£10.00	£11.75
EPS037 820/1115/1500 COLOR CAR	£15.00	£17.63
EPS043 EPSON TONER CART/EPL5500	£24.00	£28.20
EPS047 PUSH TRACTOR FOR LQ100+	£21.00	£24.68
EPS048 EPS/LQ100+ FABRIC RIBBON	£3.00	£3.53
EPS053 STYLUS COLOR/PRO/XL+ BLK	£8.00	£9.40
EPS054 EPS/STYLUS PRO/XL COLcart	£16.00	£18.80
EPS056 EPSON SERIAL I/F	£25.00	£29.38
EPS057 EPSON SERIAL I/F 32K	£68.00	£79.90
EPS059 GROUP 1 RTB 3 YEAR WARRANT	£21.00	£24.68
EPS060 GROUP 2 COVERPLUS 3YR	£29.00	£34.08
EPS061 GROUP 3 COVERPLUS 3YR	£48.00	£56.40
EPS062 GROUP 4 COVERPLUS 3YR	£80.00	£94.00
EPS063 EPSON FX/LX FABRIC RIBBON	£2.00	£2.35
EPS069 STLU 400/500/600/PHOTOblk	£13.00	£15.28
EPS070 STYLUS 200/500 COLOUR CAR	£16.00	£18.80
EPS071 EPS-STYL/1000TRACTOR FEED	£60.00	£70.50
EPS073 EPSON EPL-4000 TONER CART	£79.00	£92.83
EPS074 EPS/EPL4000photoconductor	£101.00	£118.68
EPS075 EPL3000 IMAGING CARTRIDGE	£68.00	£79.90
EPS077 EPL 5500/5200photoCONDUCT	£36.00	£42.30
EPS078 EPL5000/5200 IMAGING CART	£81.00	£95.18
EPS080 EPS/DFX500/8000printSTAND	£139.00	£163.33
EPS081 EMULATION INTFACE EPL5500	£62.00	£72.85
EPS084 LOCAL TLK INTFACE EPL5500	£61.00	£71.68
EPS086 EPSON 2170/2070 BLK RIBBO	£10.00	£11.75
EPS089 EPSON 200 COLOUR UPG KIT	£29.00	£34.08
EPS090 EPSON LX300 2ND TRAC FEED	£15.00	£17.63
EPS093 EPSON RIBBON LQ 200-870	£3.00	£3.53
EPS094 EPSON BLK FILM LQ 200-870	£6.00	£7.05
EPS095 BLACK RIBBON FX1170/1050	£3.00	£3.53
EPS096 EPSON BLK RIBBON DFX D/M	£12.00	£14.10
EPS097 EPSON RIBBON REFILL DFX	£10.00	£11.75
EPS099 EPL-9000 IMAGING CARTRIDG	£138.00	£162.15
EPS110 POSTSCRIPT S/W PC XL+	£93.00	£109.28
EPS111 STYLUS 400/800+/1000 BLK	£6.00	£7.05
EPS113 EPSON 1500 BLACK INK CART	£24.00	£28.20
EPS114 GROUP 5 COVERPLUS 3YR	£141.00	£165.68
EPS115 GROUP 6 COVERPLUS 3YR	£220.00	£258.50
EPS118 EPSON PAPERROLL HOLDER	£36.00	£42.30
EPS119 LX300 COLOUR UPGRADE KIT	£26.00	£30.55
EPS120 LX300 COLOUR RIBBON	£12.00	£14.10
EPS121 LQ300 COLOR UPGRADE KIT	£29.00	£34.08
EPS130 EPL5600/1200 TONER CART	£58.00	£69.33
EPS131 EPSON 1200 A4 500 CSF	£150.00	£176.25
EPS140 HIGH CAPACITY CSF 870/570	£111.00	£130.43
EPS143 COLOUR INK 4/6/8/850/1520	£13.00	£15.28
EPS145 STYLUS 800/850/1520 BLK	£14.00	£16.45
EPS151 EPSON ETHERNET INTERFACE	£257.00	£301.98
EPS152 PDSTSCRIPT S/W MAC PRO XL	£93.00	£109.28
EPS156 STYLUS PRO XL+ COLOR CART	£16.00	£18.80
EPS157 1520/800 POSTSCRIPT 4 MAC	£88.00	£103.40
EPS161 PULL TRACTOR FOR LQ570+	£34.00	£39.95

**EPSON DEAL 1**

EPSON EPL-5700 RANGE

FROM **£236** EXVAT  
Stock Code EPS253

**BUY THIS**

EPSON STYLUS COLOR 440

WORTH **£89** EXVAT  
Stock Code EPS264

**AND GET THIS FREE**

**EPSON DEAL 2**

EPL-N1600 RANGE-  
EPL-N2000 RANGE  
EPL-N4000 RANGE

FROM **£596** EXVAT  
Stock Code EPS299 N1600

**CHOOSE ANY OF THESE**

EPSON STYLUS COLOR 640

WORTH **£118** EXVAT  
Stock Code EPS263

**AND GET THIS FREE**

**EPSON DEAL 3**

EPSON EPL-C8000 RANGE

FROM **£3983** EXVAT  
Stock Code EPS298

**BUY THIS**

EPSON STYLUS COLOR 740

WORTH **£147** EXVAT  
Stock Code EPS262

**AND GET THIS FREE**

Offer ends April 30th subject to availability. See free inbox voucher for free printer.  
FOR MORE INFORMATION SEE OUR WEB SITE AT: [www.software-warehouse.co.uk/epson](http://www.software-warehouse.co.uk/epson)

**BJC 7000 - The colour printer to outclass all others**

- Unprecedented Bubble Jet printing quality
- New P-POP technology delivers high quality printed images onto plain paper
- Prints full colour photographs hard to distinguish from the originals



BJC 25  
Everyday printing that's out of the ordinary

- Up to 3.4 pages per minute
- Free colour cartridge
- Optional photo cartridge

**JUST £73**  
(inc. VAT £85.78)  
Stock code CAN065

**BJC 4300 Intense colour that shines out every time**

- Versatile home or small office printer
- Optional photo & colour image scanner cartridges
- One Year return to Canon Warranty

**ONLY £93**  
(inc. VAT £103.28)  
Stock code CAN069

**BJC 5000 - Canon's new professional business printer**

- Unique dual cartridge system enables high speed printing
- Rapid 7.5ppm mono and 3.0ppm colour output
- New Drop Modulation Technology™, maximises printing quality for colour and photo images



**BJC 4650 The intelligent choice for A3 output**

- Exceptional quality A3 capable printer
- PC and Mac compatibility
- One Year return to Canon Warranty
- Image optimizer technology improves quality of low resolution

**JUST £139**  
(inc. VAT £153.83)  
Stock code CAN102

CAN099 Canon FB320P Scanner incVAT **£88<sup>13</sup>** EXVAT **£75**  
CAN085 Canon Powershot incVAT **£464<sup>13</sup>** EXVAT **£395**

FOR MORE INFORMATION SEE OUR WEB SITE AT: [www.software-warehouse.co.uk/canon](http://www.software-warehouse.co.uk/canon)

**FS-600 6ppm Personal Printer**

This compact yet robust printer is ideal for single users but can be easily upgraded for sharing by small workgroups.

Print Speed	6ppm
Resolution	600dpi enhanced to 1200dpi
Standard emulations	PCL 5e,
Processor	50MHz Power PC
Standard / max. memory	2 / 34Mb

KY0021 Kyocera FS-600 incVAT **£269<sup>08</sup>** EXVAT **£229**

**FS-800 8ppm Personal Printer**

This compact printer is ideal for small workgroups or individual users with higher volumes and more demanding applications.

Print Speed	8ppm
Resolution	600dpi enhanced to 1200dpi
Processor	50MHz Power PC
Standard / max. memory	4 / 36Mb
Standard paper input	150-sheet cassette

KY0043 Kyocera FS-800 incVAT **£398<sup>33</sup>** EXVAT **£339**

**FS-1700+ 12ppm Laser Printer**

The FS-1700 laser printer is ideal for mid-volume network and workgroup printing.

Print Speed	12ppm
Resolution	600dpi enhanced to 1200dpi
Connectivity	Full SNMP support for PC networks
Processor	66MHz
Standard / max. memory	4 / 68Mb
Standard paper input	250 cassette, 100 multi-purpose

KY0035 Kyocera FS-1700+ incVAT **£609<sup>83</sup>** EXVAT **£519**

**FS-3700+ 18ppm Laser Printer**

This 18ppm printer is ideal for higher volume network printing, with a high speed processor for maximum performance.

Print Speed	18ppm
Resolution	600dpi enhanced to 1200dpi
Connectivity	Full SNMP support for PC networks
Processor	100MHz Power PC
Standard / max. memory	4 / 68Mb

KY0042 Kyocera FS-3700+ incVAT **£938<sup>83</sup>** EXVAT **£799**

**FREE\* £129<sup>98</sup> worth of software with every printer**

- PhotoStudio V.2.02 RRP £79\*
- PhotoFantasy 1.5 and PhotoPrinter 1.0 RRP £49\*

**FREE £129<sup>98</sup> worth of software**



\*Only valid when printer purchased with a cable and cartridge



# SOFTWARE WAREHOUSE

**LOW PRICE INDEX**  
PERIPHERALS/COMPONENTS

IF YOU CAN FIND IT CHEAPER CALL US - WE WON'T BE BEATEN!\*

## Brother HL-820

Robust, low cost Windows® only printer. Ideal for the small office or home user.

- Key Features
- 8 pages per minute
  - 600dpi print resolution
  - Windows® dedicated printing
  - 2Mb of standard memory
  - 200 sheet paper input
  - Semi automatic double sided printing
  - Intelligent sleep mode



BRO081 HL-820 IncVAT £186<sup>43</sup> ExVAT £159

BRO082 HL-1040 IncVAT £210<sup>33</sup> ExVAT £179

BRO092 HLP-2000 IncVAT £280<sup>43</sup> ExVAT £239

BRO083 HL-1050 IncVAT £245<sup>38</sup> ExVAT £209

BRO088 HL-1050i (8Mb) IncVAT £263<sup>20</sup> ExVAT £224

BRO084 HL-1070 IncVAT £323<sup>13</sup> ExVAT £275

BRO087 HL-1070 (8Mb) IncVAT £340<sup>78</sup> ExVAT £290

BRO070 HL-1660e IncVAT £680<sup>33</sup> ExVAT £579

## LEXMARK Lexmark 1100

High colour performance for every budget!

- Up to 600 x 600 dpi resolution
- Ready for Windows 98

LEX058	1100	IncVAT £89 <sup>90</sup>	ExVAT £75 <sup>65</sup>
LEX059	3200	IncVAT £135 <sup>07</sup>	ExVAT £114 <sup>65</sup>
LEX047	5700	IncVAT £164 <sup>44</sup>	ExVAT £139 <sup>65</sup>

## LEXMARK Optra E+

The highly compact Optra that's big on performance

- 6ppm mono laser printer
- 600 x 600dpi resolution Image Quality output
- 16MHz processor with 2Mb Ram



LEX081	Optra E+	IncVAT £245 <sup>37</sup>	ExVAT £209
LEX085	Optra S1255	IncVAT £750 <sup>65</sup>	ExVAT £639
LEX064	Optra S1255n	IncVAT £938 <sup>62</sup>	ExVAT £799

ACE010	AcerScan 310P	IncVAT £55 <sup>23</sup>	ExVAT £47
ACE040	AcerScan 310U	IncVAT £69 <sup>33</sup>	ExVAT £59
ACE009	AcerScan 310S	IncVAT £76 <sup>38</sup>	ExVAT £65
ACE026	AcerScan 620P	IncVAT £81 <sup>08</sup>	ExVAT £69
ACE052	AcerScan 620U	IncVAT £92 <sup>63</sup>	ExVAT £79
ACE027	AcerScan 620S	IncVAT £116 <sup>33</sup>	ExVAT £99
ACE051	AcerScan 610PT	IncVAT £151 <sup>58</sup>	ExVAT £129
ACE054	AcerScan 620ST	IncVAT £175 <sup>08</sup>	ExVAT £149

## HP ScanJet 4100C HP ScanJet 3200C

No experience required: LOW LOW PRICE

NEW LOW PRICE **£63** (Inc. VAT £74.03) Stock code HWP438

NEW PRODUCT

HEWLETT PACKARD Expanding Possibilities

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## GT-7000 Colour Scanner

Easy-to-use, high quality 9600dpi scanner with Start Button for one touch

- High Quality 600 x 2400dpi optical resolution with EPSON Micro Step Drive
- Can distinguish 68 billion different colours (36-bit)
- Start Button for easy one touch scanning
- Ultra fast scanning - a leader in it's class



EPS269	GT-7000 Scanner	IncVAT £172 <sup>73</sup>	ExVAT £147
EPS107	GT-7000 Photo + film adapter	IncVAT £231 <sup>48</sup>	ExVAT £197

## MICROTEK ScanMaker X6

- FEATURES
- New "GO" button (launches the PC Software to scan, fax or copy)
  - Optical resolution 600 x 1200 dpi
  - Interpolated 9600 x 9600 dpi
  - Colour Depth 36 bit

36-bit

JUST **£149** (Inc. VAT £175.08) Stock code SCA025

SCA021 Transparent Media Adaptor IncVAT £88<sup>13</sup> ExVAT £75

## MICROTEK Phantom 336CX USB

- FEATURES
- Designed for ease of use and simplicity
  - Ultra streamlined and compact design
  - Extremely easy to install
  - Ideal for Notebooks
  - Contact Image Sensor technology
  - Lightweight, small, portable
  - OmniPage LE & Photo Express inc. FREE!!

36-bit

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## UMAX Astra 1220S

Single pass colour Flatbed Scanner

The Astra 1220 colour scanners from Umax is possibly the easiest scanner you'll ever use. With Vistascan automated scanner control software just place your image on the scanner and in one simple step it's in your computer and ready to go. High quality is assured with true 36 bit output, and all at super quick speed. The UMAX Astra 1220P also includes Magic Match, an automatic colour calibration profile and Kodak colour management system for consistent colours from scan, display to print.



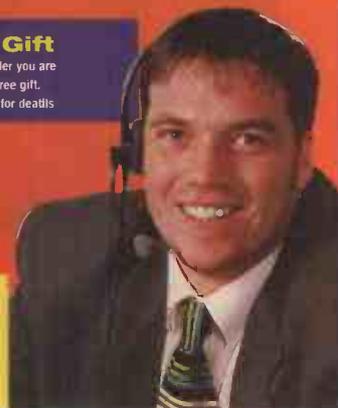
### Features

- 36-bit technology
- 69 billion colours
- Optical resolution: 600 x 1200 dpi
- Max resolution: 9,600 x 9,600 dpi
- 8.5"x11.7" max scan area
- Prestol PageManager: All-in-one scanning solution
- UMAX Copy Utility: Turns your printer into a copy machine
- OmniPage Direct OCR software

UMA041	Astra 1220U (USB)	IncVAT £98 <sup>99</sup>	ExVAT £84 <sup>25</sup>
UMA037	Astra 1220P+Photoshop LE	IncVAT £135 <sup>12</sup>	ExVAT £115
UMA031	Astra 1220S	IncVAT £149	ExVAT £126 <sup>41</sup>
UMA033	Astra 1220s+PhotoshopLE	IncVAT £186 <sup>83</sup>	ExVAT £159
UMA039	1220 Series Tranny Adaptor	IncVAT £211 <sup>50</sup>	ExVAT £180

### Free Gift

With every order you are entitled to a free gift. See page two for details



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CRE052	CREATIVE SB LIVE! VALUE	£49.00	£57.58

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**MODULAR**

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- Ultra-wide, high-speed 128-bit memory architecture and Twin-Textel 3D pipeline.
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KOD028	DC220 Digital Camera	INC VAT £492 <sup>33</sup>	EX VAT £419
KOD029	DC260 Digital Camera	INC VAT £786 <sup>98</sup>	EX VAT £669
KOD027	DV323 Digital Video Camera	INC VAT £151 <sup>59</sup>	EX VAT £129

**Sanyo digiCAM**

The digiCAM 400 or solarCAM has a LCD display that is powered by the sunlight. The digiCAM 250/350 Video Clip cameras use Rechargeable batteries



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SAN018	Sanyo digiCAM VGA210 (as SAN002 but with removable storage)	INC VAT £276 <sup>13</sup>	EX VAT £235
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12Mb 3D Graphics Accelerator based on 3Dfx Voodoo2 chipset. More power than you can handle! Power3D2 from Techworks delivers the mind-blowing performance of an arcade on your computer.



- Voodoo2 graphics engine on board
- Win98, Glide, OpenGL 1.1, DirectX/Direct 3D compatible
- Support for largest choice of games
- Easy installation and set-up
- Optimised design
- 12Mb ultra-fast DRAM

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DIA059	Diamond Mon/Fusion Exl AGP 16Mb	INC VAT £117 <sup>44</sup>	EX VAT £99 <sup>99</sup>
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- 1024 x 768 resolution

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- Unlimited colour range
- 100MHz Max vertical frequency

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ADI015	ADI MICROSCAN 5GT TRIN 17	£269.00	£316.06
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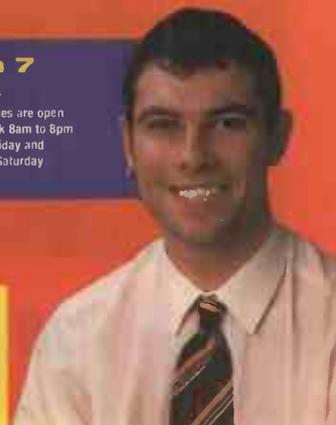
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GIG024 DUAL P2 + SCSI ATX BX	£219.95	£258.44
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INT163 INTEL AL440LX P2 BARE ATX	£99.00	£116.33
INT127 INTEL AL440LX ATX + SOUND	£99.00	£116.33
INT126 INTEL AL440LX P2 ATX NDSO	£91.00	£116.33

## PC UPGRADES

	EX VAT	INC VAT
<b>CPU's</b>		
AMD015 AMD K6-2 3D 333MHz	£69.33	£89.00
AMD016 AMD K6-2 3D 350MHz	£81.08	£99.00
AMD019 AMD K6-2 3D 350 BOXED	£92.83	£111.57
AMD017 AMD K6-2 380MHz BARE	£116.33	£140.94
AMD018 AMD K6-2 3D 400MHz BARE	£128.08	£151.58
<b>Cyrix</b>		
CYR006 CYRIX M2 P200MMX (66MHz)	£44.00	£51.70
CYR009 CYRIX MII 300MHz MMX	£50.00	£58.75
CYR010 CYRIX (IBM) MII 333MHz	£63.00	£74.03
<b>Intel</b>		
INT034 CELERON 300A SOCKET 370	£48.00	£56.40
INT042 CELERON 333A SOCKET 370	£63.00	£74.03
INT045 CELERON 366A SOCKET 370	£92.00	£108.10
INT229 CELERON 366A SLOT 1	£101.00	£118.66
INT051 CELERON 400A SOCKET 370	£117.00	£137.48
INT230 CELERON 400A SLOT 1	£126.00	£148.05
INT171 PENTIUM II 350MHz RETAIL	£150.00	£176.25
INT181 PENTIUM II 400MHz RETAIL	£258.00	£303.15
INT193 PENTIUM II 450MHz RETAIL	£398.00	£467.65
INT211 XEON 400MHz 512K CACHE	£595.00	£699.13
INT214 XEON 450MHz 512 CACHE	£613.00	£720.26
INT215 XEON 450MHz 1024 CACHE	£1,412.00	£1,659.10
INT212 XEON 400MHz 1024 CACHE	£1,415.00	£1,662.63
INT223 XEON 450MHz 2MB CACHE	£2,712.00	£3,186.60

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## Sony Monitors

### Sony 21" Multiscan F500 Flat Display Monitor



#### Features

- 21" Flat Display FD Trinitron monitor, with horizontally and vertically flat screen, ideal for professionals
- Horizontal frequency of 122kHz
- Maximum resolution of 1880 x 1440 at 81Hz
- Ultra-fine beam with 0.22mm aperture grille pitch, for sharper images
- AR coating to minimise light reflections
- Improved focus performance with EFEAL and MALS technology
- Better screen uniformity, with Beam Landing Correction
- Easy to use On-Screen Display

SON166 F500 £1526<sup>33</sup> EXVAT £1299

### Sony 19" 420GST Multiscan Trinitron Monitor



#### Features

- 19" Trinitron® CRT
- Maximum resolution 1200 x 600 at 75 Hz
- 0.25 - 0.27mm variable pitch
- Dimensions 17.5" x 18.5" x 17.4" (W x H x D)

SON079 420GST £527<sup>99</sup> EXVAT £449

### Sony 15" Trinitron CRT

#### Features

- 15" Trinitron® CRT (285mm x 215mm viewable image size)
- Maximum resolution 1024 by 768 at 85 Hz
- Shorter CRT so taking up less desk space
- Graphic Picture Enhancement adjusts colour temperature, brightness and contrast to suit application (Presentation/Video)

SONY49 CPD 100GST £233<sup>83</sup> EXVAT £199

### Sony 19" Trinitron CRT

#### Features

- 19" Trinitron® CRT (365x 274mm viewable image size)
- Maximum resolution 1600 by 1200 at 75Hz
- Low power consumption
- Dual Inputs - via 15-pin D-Sub or 5 BNC connectors - allowing two systems to run simultaneously on the one monitor
- Auto Size and Centring function for easy set-up

SONY65 GDM 400PST £586<sup>33</sup> EXVAT £499

### Sony 21" Trinitron CRT



#### Features

- 21" Trinitron® office monitor, for big screen performance in a business environment
- 30.96 kHz horizontal frequency for ergonomic refresh rates even at high resolution
- 1600 x 1200 dpi @ 75Hz
- AR coating for less reflections, without compromising brightness

SONY30 CPD 520GST

EXVAT £880<sup>08</sup>

£749

## Digital Mavica Camera



This is your camera



This is your film



This is your Developer

E-mailing the sights and sounds of life has never been easier!!

With a 380,000 pixel CCD, the Digital Mavica MVC-FD7 allows for VGA (640 x 840) resolution pictures to be stored on a standard floppy disc. It works on the Infolithium™ battery system which tells you how much recording time is remaining in minutes.



SON141 SONY MVC-FD71 Digital Mavica  
EXVAT £645<sup>08</sup> EXVAT £549

SON154 -SONY MVC-FD81 Digital Mavica  
EXVAT £703<sup>83</sup> EXVAT £599

SONY

## Sony Monitors

### Sony 17" Trinitron Multiscan CPD 200EST

The Sony Multiscan 200EST (17" CRT) focuses on environmental ergonomics and therefore complies with the TCO'92 standard, and features a power consumption of zero watt in power-off mode.

A maximum resolution of 1024 x 768 at a refresh rate of 85 Hz ensures flicker free images. This model is suited for any workplace.

#### Features

- 17" Trinitron® CRT (328mm x 242mm viewable image size)
- Maximum resolution 1024 by 768 at 85Hz
- Low power consumption
- Trinitron aperture grille for excellent colour and brightness, crisp pictures and contrast
- Windows '95 'plug and play' compatible (DDC 1/2B)
- Meets or exceeds industry standards - TCO'92, MPR II and International Energy Star



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EVE242 486/20, 25, DX2/50 MHz 586/80 or 100 MHz EXVAT £81<sup>08</sup> EXVAT £69

EVE200 75 MHz & higher Pentium PC 200 MHz EXVAT £104<sup>88</sup> EXVAT £89

EVE333 75 MHz & higher Pentium PC 333 MHz EXVAT £198<sup>58</sup> EXVAT £169

EVE385 5-Pack 200 MHz EXVAT £446<sup>50</sup> EXVAT £380

EVE384 5-Pack 100 MHz / 133 MHz EXVAT £352<sup>50</sup> EXVAT £300

## AMD

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- More realistic and lifelike 3D imaging and graphics
- Big Screen sound and video
- Ultimate Internet experience



AMD015 AMDK6-2 3D 333MHz EXVAT £69<sup>33</sup> EXVAT £59

AMD016 AMDK6-2 3D 350MHz EXVAT £81<sup>08</sup> EXVAT £69

AMD017 AMDK6-2 3D 380MHz EXVAT £116<sup>33</sup> EXVAT £99

AMD018 AMDK6-2 3D 400MHz EXVAT £128<sup>08</sup> EXVAT £109

## intel



INT229 Celeron 366MHz 128k Cache EXVAT £101 EXVAT £118<sup>08</sup>

INT230 Celeron 400MHz 128k Cache EXVAT £126 EXVAT £148<sup>05</sup>

INT171 Pentium II 350MHz Retail EXVAT £150 EXVAT £176<sup>25</sup>

INT181 Pentium II 400MHz Retail EXVAT £258 EXVAT £303<sup>15</sup>

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CODE	MODEL	CAPACITY/Gb	SPEED/rpm	ACCESS TIME/s	Ex. VAT	INC. VAT
SEA203	MEDALIST ST33210A	3.2	5400	11	£75.00	£88.13
SEA164	MEDALIST ST34321A	4.3	5400	11	£83.00	£97.53
SEA165	MEDALIST ST36531A	6.5	5400	11	£99.00	£116.33
SEA212	MEDALIST ST36422A	6.4	5400	11	£99.00	£116.33
SEA167	MEDALIST ST38641A	8.6	7200	9.5	£129.00	£151.58
SEA192	MEDALIST ST310230A	10.2	5400	10.5	£189.00	£222.08
SEA193	MEDALIST PRO ST34520N	4.5	7200	9.5	£142.00	£166.85
SEA194	MEDALIST PRO ST36530N	6.5	7200	9.5	£194.00	£227.95
SEA175	BARRACUDA ST34573N	4.5	7200	7.8	£259.00	£304.33
SEA196	MEDALIST PRO ST39140N	9.1	7200	9.5	£249.00	£293.58
SEA176	BARRACUDA ST39173N	9.1	7200	7.8	£309.00	£363.08
SEA179	BARRACUDA ST118273N	18.2	7200	7.8	£526.00	£618.05
SEA044	ELITE ST423451N	23.4	5400	13	£999.00	£1,173.83
SEA188	MEDALIST PRO ST34520W	4.5	7200	9.5	£139.00	£163.33
SEA195	MEDALIST PRO ST36530W	6.5	7200	9.5	£199.00	£238.83
SEA078	CHEETAH ST34501W	4.5	10033	6	£317.00	£372.43
SEA181	BARRACUDA ST39173W	9.1	7200	7.8	£309.00	£363.08
SEA030	MEDALIST PRO ST39140W	4.5	10033	6	£254.00	£294.45
SEA171	BARRACUDA ST118273W	18.2	7200	7.8	£599.00	£703.83
SEA162	ELITE ST423451WD	23.4	5400	13	£996.00	£1,170.30
SEA156	BARRACUDA ST34572WC	4.5	7200	7.8	£315.00	£370.13
SEA177	CHEETAH ST34502LC	4.5	10033	5.4	£353.00	£414.78
SEA173	BARRACUDA ST39173LW	9.1	7200	7.8	£446.00	£524.05
SEA178	CHEETAH ST39102LW	9.1	10033	5.4	£399.00	£468.83
SEA189	BARRACUDA ST39173WC	9.1	7200	7.8	£309.00	£363.08



## Maxtor High Performance Ultra DMA No Quibble 3 Year Warranty - Ask for details

CODE	PRODUCT	CAPACITY	MODEL	SPEED RPM	EX VAT	INC VAT
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MAX012	DIAMONDMAX 3400	6.8GB	90680D4	7200	£99.00	£116.33
MAX013	DIAMONDMAX 3400	10.2GB	91020D6	5400	£139.00	£163.33
MAX014	DIAMONDMAX 3400	13.6GB	91360D8	5400	£175.00	£205.63
MAX015	DIAMONDMAX PLUS 2500	5GB	91360D8	5400	£84.00	£98.70
MAX016	DIAMONDMAX PLUS 2500	7.5GB	90750D6	7200	£139.00	£163.33
MAX061	DIAMONDMAX PLUS 2500	10.0GB	91000D8	7200	£170.00	£199.75
MAX066	DIAMONDMAX 4320	4.3GB	90432D2	5400	£86.00	£101.05
MAX067	DIAMONDMAX 4320	6.4GB	90845D4	5400	£98.00	£115.15
MAX068	DIAMONDMAX 4320	8.4GB	90845D4	5400	£104.00	£122.20
MAX069	DIAMONDMAX 4320	13.0GB	91303D6	5400	£159.00	£186.83
MAX070	DIAMONDMAX 4320	17.2GB	91728D8	5400	£199.00	£233.83

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QUA118	FIREBALL EL	7.6GB	QM307600EL 5400	9.5ms	£115.00	£135.13
QUA120	FIREBALL EX	3.2GB	QM303200EXA 5400	9.5ms	£76.00	£89.30
QUA122	FIREBALL EX	6.4GB	QM307600EXA 5400	9.5ms	£93.00	£109.28
QUA123	FIREBALL EX	10.2GB	QM310200EXA 5400	9.5ms	£149.00	£175.08
QUA124	FIREBALL EX	12.7GB	QM312700EXA 5400	9.5ms	£154.00	£180.95
QUA131	BIGFOOT TS	6.4GB	QM506400TSA 4000	10.5ms	£89.95	£105.69
QUA132	BIGFOOT TS	12.7GB	QM512700TSA 4000	10.5ms	£156.00	£183.30
QUA133	BIGFOOT TS	19.2GB	QM519200TSA 4000	10.5ms	£226.00	£265.55

## HP SureStore HP Surestore CD-RW 7200i & 7200e

The HP Surestore CD-Writer Plus uses revolutionary CD-rewritable technology to enable you to write, update, erase and rewrite up to 650MB of data on a single CD-RW disk. Now you can use CDs just like a floppy for dynamic storage applications such as multimedia presentations, audio and photographic projects which can then be easily transported to other users. For maximum versatility the HP SureStore CD-Writer Plus is compatible with both CD-RW and existing CD-R media.



HWP336 HP SureStore CD-Writer 7200e **INC VAT £229** **EX VAT £269.05**

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HWP433 HP Colorado 8GB EXT **INC VAT £205.43** **EX VAT £175**

HWP545 HP T20 Ex TR-5 **INC VAT £398.33** **EX VAT £339**

## Nomai 680.RW

Your Home CD Creator Create & duplicate your own CD's in one easy step

- The Nomai 680RW reads, writes and erases!
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- Each kit contains a drive, Easy CD Creator & Direct CD (Plus Direct CD For Mac and Toast software for the external SCSI drive + 1 CDR and 1 pre-formatted CDRW, installation guide, cables and power supply (external kits only) Plus a CD label kit.



NOM029 Nomai 680RW EXT P/P **INC VAT £198.98** **EX VAT £169**

NOM030 Nomai 680RW EXT SCSI Mac/PC **INC VAT £211.50** **EX VAT £180**

NOM031 Nomai 680 INT IDE **INC VAT £170.38** **EX VAT £145**

NOM032 Nomai 680 INT SCSI Retail Kit **INC VAT £188** **EX VAT £160**

NOM033 Nomai Preformatted CD/RW **INC VAT £5.29** **EX VAT £4.50**

NOM034 Nomai 10 Pack CD/R **INC VAT £9.64** **EX VAT £8.20**

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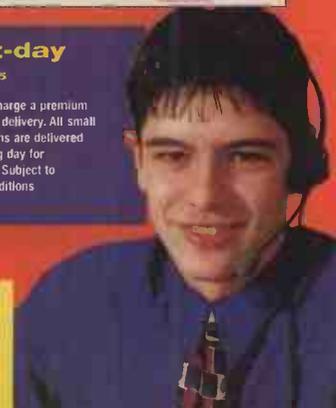
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<b>IBM</b>		
IBM184 TITAN 16GP 8.4GB UDMA	£125.00	£146.88
IBM185 TITAN 16GP 10.1GB UDMA	£149.00	£175.08
IBM186 TITAN 16GP 12.9GB UDMA	£194.00	£227.95
IBM187 TITAN 16GP 16.8GB UDMA	£245.00	£287.88
IBM188 TITAN 14GP 10.1GB UDMA	£169.00	£198.58
IBM189 TITAN 14GP 14.4GB UDMA	£253.00	£297.28
<b>WESTERN DIGITAL</b>		
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WES013 WD 13.1GB EIDE BARE DRIVE	£169.00	£198.58
WES025 WD 4GB EIDE KIT	£97.00	£113.98
WES030 WD 6.4GB IDE BARE DRIVE	£102.00	£119.85
WES031 WD 6.4GB IDE RETAIL KIT	£110.00	£129.25
WES033 WD 3.2GB EIDE BARE	£83.00	£97.53
WES044 WD 10.1GB UDMA-33 RETAIL	£142.00	£166.85
WES046 WD CAVIAR 3.2GB BARE	£86.00	£101.05
WES047 WD CAVIAR 4.3GB BARE	£91.00	£106.93
WES049 WD CAVIAR 8.4GB BARE	£116.00	£136.30
WES050 WD 8.4GB IDE RETAIL KIT	£127.00	£149.23
WES051 WD 13GB EIDE KIT	£175.00	£205.63

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HWP336 HP SURESTORE 7200E CD-RW	£229.00	£269.08
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<b>MITSUMI</b>		
MIT042 MITSUMI RBX W2X EIOE	£119.95	£140.94
MIT062 MITSUMI INT EIDE 8X4X	£165.00	£193.88
<b>NOMAI</b>		
NOM014 NOMAI 680RW EXT SCSI bare	£265.00	£311.38
NOM021 NOMAI 680RW INT SCSI KIT	£310.00	£364.25
NOM023 NOMAI 680RW INT IDE KIT	£205.00	£240.88
NOM024 NOMAI 680RW EXT CARD+SOFT	£290.00	£340.75
NOM026 NOMAI 680RW EXT SCSI+SOFT	£262.99	£309.01
NOM027 NOMAI 680RW EXT MAC	£272.95	£320.72
NOM028 NOMAI 680RW INT SCSI+SOFT	£250.95	£294.87
NOM029 NOMAI 680RW EXT P/P	£169.00	£198.58
NOM030 NOMAI 680RW EXT SCSI	£180.00	£211.50
NOM031 NOMAI 680 R/W INT IDE+SW	£145.00	£170.38
NOM032 NOMAI 680 INT SCSI KIT	£160.00	£188.00
<b>PHILIPS</b>		
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PHI028 PC350RW INT SCSI 2X2X6	£189.00	£222.08
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AMA042 AMACOM 4-8GB PP+SCSI DAT	£759.00	£891.83
AMA043 AMACOM 12-24GB PP+SCSI DAT	£1,059.00	£1,244.33
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COM057 COMPAQ 4/8 DAT DRIVE	£620.00	£728.50
COM059 COMPAQ 4/8GB DAT DRIVE	£620.00	£728.50
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EXA003 EXABYTE 4200C INT	£865.00	£1,016.38
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EXA010 EXABYTE 8700Ext 14GB SCSI	£1,090.00	£1,280.75
EXA011 EXABYTE 8700LT 14GB SCSI	£790.00	£928.25
EXA012 EXABYTE 3.2GB W/CARD TAPE	£199.00	£233.83
EXA013 EXABYTE 3.2GB B/U/PintBARE	£149.00	£175.08
EXA023 EXABYTE ELIANT 820 (INT)	£1,300.00	£1,527.50
<b>Hewlett-Packard</b>		
HWP169 HP SURESTORE DLT 30e EXT	£1,750.00	£2,056.25
HWP170 HP SURESTORE DLT 40e EXT	£2,100.00	£2,467.50
HWP173 HP 2GB 4mm DAT DRIVE BARE	£374.40	£439.92
HWP191 HP SURESTORE DAT 24e	£899.00	£1,056.33
HWP192 HP SURESTORE DAT 24x6e	£2,299.00	£2,701.33
HWP193 HP COLORADO T3000 INT	£109.00	£128.08
HWP220 HP SURESTORE T4i 4GB INT	£269.00	£316.08
HWP277 HP COLORADO 5GB INTERNAL	£139.00	£163.33
HWP278 HP COLORADO 5GB EXT P/P	£155.00	£182.13
HWP298 HP SURESTORE DAT 24x6i	£1,748.00	£2,053.90
HWP302 DAT AUTOLOADER CART X6	£25.00	£29.38
HWP305 SP SURESTORE TAPE DLT 70E	£4,999.00	£5,873.83
HWP306 HP SURESTORE T4e 4GB EXT	£329.00	£386.56
HWP339 HP DLT LIBRARY 15-SLOT	£14,000.00	£16,450.00
HWP358 HP SURESTORE DAT 24i	£888.25	£1,020.19
HWP430 HP COLORADO 8GB INT	£145.00	£170.38
HWP432 HP COLORADO 8GB INT+media	£170.00	£199.75
HWP433 HP COLORADO 8GB EXT	£179.00	£210.33
HWP434 HP COLORADO 8GB EXT+media	£199.00	£233.83
HWP462 HP SURESTORE DLT 40i INT	£2,000.00	£2,350.00
HWP483 HP COLORADO 5GB EXT PP	£139.00	£163.33
HWP540 HP SURESTORE 5000E 4GB EX	£450.00	£528.75
HWP541 HP SURESTORE 5000i 4GB IN	£375.00	£440.63
HWP542 HP SURESTORE DAT8i INTERN	£550.00	£646.25
HWP543 HP SURESTORE DAT8e 8GB EX	£650.00	£763.75
HWP544 SURESTORE T20i TR-5 INT	£299.95	£352.44
HWP545 SURESTORE T20E TR-5 EXT	£349.95	£411.19
SUR001 SURESTORE 2000SCSI INT.	£319.00	£374.83
SUR002 SURESTORE 5000 SCSI INT.	£399.00	£468.83
SUR003 SURESTORE DAT 8i INT SCSI	£644.00	£756.70
SUR004 SURESTORE 2000 SCSI EXT	£319.00	£374.83
SUR005 SURESTORE 5000 SCSI EXT	£589.00	£692.08
SUR006 SURESTORE DAT 8e EXT SCSI	£555.00	£652.13
SUR008 SURESTORE 12000 SCSI EXT	£1,999.00	£2,348.83
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IOM008 IOMEGA DITTO MAX PRO EXT	£169.00	£198.58
IOM009 IOMEGA DITTO MAX PRO INT	£139.00	£163.33
IOM036 IOMEGA DITTO 2GB INTERNAL	£89.95	£106.19
IOM073 ZIP P/P+6 MEDIA PK+MOUSES	£135.00	£158.63
IOM074 ZIP ATAPI INT RETAIL BOX	£69.00	£81.08
IOM077 ZIP STARTER PACK	£109.00	£128.08
IOM080 IOMEGA NT TOOLS DITTO MAX	£14.00	£16.45
IOM081 IOMEGA ZIP 100 USB DRIVE	£99.00	£116.33

## Zip Drive

There's nothing worse than a bad data day. Which is why you need a Zip drive.

IOM022 Zip Drive Parallel Port	INC VAT £92 <sup>83</sup>	EX VAT £79
IOM020 Zip Drive (SCSI) ext	INC VAT £92 <sup>83</sup>	EX VAT £79
IOM074 IDE ATAPI Internal Drive	INC VAT £81 <sup>00</sup>	EX VAT £69
IOM077 Zip Starter Pack (PP Drive+Pack+Software)	INC VAT £128 <sup>08</sup>	EX VAT £109
IOM085 Zip RED 250Mb Drive	INC VAT £152 <sup>88</sup>	EX VAT £129 <sup>99</sup>

## 2Gb Jaz Drive

- 2GB of storage space on each compact Jaz cartridge basic coverage.
- Faster than many hard drives - 7.35MCB/s average transfer rate
- Ideal as a hard drive back-up. Provides 4GB capacity with 2:1 compression
- Completely portable. Share data between PC's or from a MAC™ to a PC
- Complete set of software utilities and tools make Jaz versatile and easy to use.

IOM057 Jaz 2Gb Drive (SCSI Internal)	INC VAT £292 <sup>58</sup>	EX VAT £249
IOM058 Jaz 2Gb Drive (SCSI External)	INC VAT £292 <sup>58</sup>	EX VAT £249

## Flip Disk Baby Zip

Portable Hard Drive      Portable Zip Drive



**Features**

- No Power or Interface Cables required
- No Increase in Hard disk capacity
- PCMCIA interface - Plug & Play
- Maximum capacity is dependant upon NovaDisk compression Software
- Transfer data between Laptop or Desk Top\*

\* Requires optional parallel port cables

NOV141 Nova Software	INC VAT £22 <sup>33</sup>	EX VAT £19
AMA025 Flip Disk 2.1-4.2Gb	INC VAT £293 <sup>75</sup>	EX VAT £250
AMA046 Flip Disk 4.0-8.0Gb	INC VAT £370 <sup>13</sup>	EX VAT £315
AMA050 Flip Disk 6.4-12.8Gb	INC VAT £451 <sup>20</sup>	EX VAT £384
AMA052 Baby Zip	INC VAT £210 <sup>33</sup>	EX VAT £170

**Features**

- Power directly from your computer
- Uses standard Iomega 100MB Zip disks
- PCMCIA connection or optional Parallel port cables
- No specific drivers required (Win 95), real plug & play
- 16 bit data transfer - Up to 3.3MB/sec
- Automatic media verification during format

## YAMAHA

Introduces the World's First 4x CD Re-Writable Drive

No other storage medium is so cost-effective. No other medium can be read by 200 million computers worldwide.

And no other medium lets you record music and play it back on your stereo or in your car. Yamaha makes the CD-RW drives that everyone else is compared to because of quality, features, price and software.

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YAM028 CDRW66165 Int. SCSI	INC VAT £270 <sup>25</sup>	EX VAT £230
YAM026 CRW4261 Int. EIDE	INC VAT £233 <sup>83</sup>	EX VAT £199
YAM032 CORW4416TX Ext.	INC VAT £316 <sup>00</sup>	EX VAT £269

## Star Trek Zip Disk Packs

Flexibility for your data. The new standard for portable storage. Presentations, Graphics, pictures games and spreadsheets all handled with ease on your zip.

Save £s when you buy the Iomega multi coloured 6 pack. This bundle also comes complete with a free Starship Creator Game.



IOM030 Zip Disk Grey x 10	INC VAT £76 <sup>38</sup>	EX VAT £65
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## Buz Get all your multimedia stuff into your PC

Introducing the Iomega Buz - the easiest way to get multimedia from camcorders, DVD-ROMs, CD-ROMs, VCRs, and laser disc players into a PCI included a platform video capture and editing board combined with an Ultra SCSI controller that lets users:

- Put their multimedia (video, sounds, pictures, music, etc) onto their PC
- Personalise it using the easiest software around
- Share it with their friends, family, co-workers, etc. using a Jaz or Zip disk, or even the Internet!



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## PANASONIC DVD RAM LF-D101E

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- Watch DVD movies (requires MPEG decoder hardware or software)



## PANASONIC Zip Retail Pack JU 811TS

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- 100% compatible with Iomega Zip
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The Philips CDD 3610 is a 6x CD-ROM reader that lets you create your own CDs in addition to recording intonation on low cost CD-Recordable (CD-R) media. It is also the first drive on the market to write and rewrite newly standardised CD-Rewritable (CD-RW).

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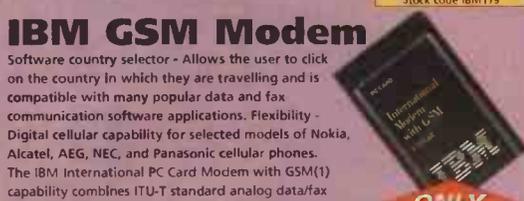
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Telephone  
0191 260 3250  
Facsimile  
0191 260 3251



## NORWICH

2 Queens Road  
Norwich  
NR1 3PR

Telephone  
01603 219 922  
Facsimile  
01603 627 635



## NOTTINGHAM

64 Mansfield Rd  
Nottingham  
NG1 3GY

Telephone  
0115 948 1910  
Facsimile  
0115 941 1791



## PLYMOUTH

112 Cornwall St  
Plymouth  
PL1 1NF

Telephone  
01752 220 740  
Facsimile  
01752 220 750



## READING

93 Caversham Road  
Reading  
RG1 8AN

Telephone  
0118 956 8686  
Facsimile  
0118 956 1583



## SOUTHAMPTON

9 Castle Way  
Southampton  
SO14 2BX

Telephone  
01703 232 978  
Facsimile  
01703 234 894



## LONDON - CENTRAL

20-21  
St Giles High St  
London  
WC2H 8LN

Telephone  
0171 836 0599  
Facsimile  
0171 379 6895



## LONDON NORTH

201 Baker Street  
London  
NW1 1UY

Telephone  
0171 224 4111  
Facsimile  
0171 224 4114



## LONDON WEST - MOVING SOON

3-4 Abbey Parade  
Hanger Lane  
London  
W5 1EE

Telephone  
0181 810 7770  
Facsimile  
0181 810 7771

**DUE TO THE FANTASTIC SUCCESS OF THIS SHOP WE NEED BIGGER PREMISES - CALL US NOW FOR FURTHER DETAILS ON 0800 035 40 45**



## CALL IN NOW FOR YOUR FREE INTERNET ACCESS CD STARTER KIT



For mail order pricing on the high street, simply visit any of our Retail Stores, conveniently situated in a town near you. Waiting for you are friendly experienced staff, all of which have access to an "in-store" technical expert, on-hand to answer any pre and post-sales problems you may have. Visit us now and collect your FREE Internet CD Starter kit, just one of the many special offers we have in-store!

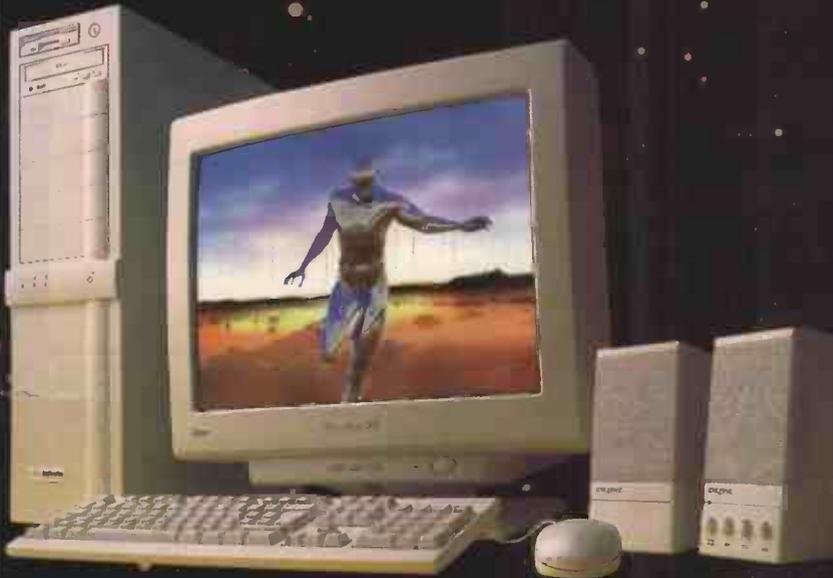
**All shops open between 9.30am and 5pm Monday to Saturday, with certain stores opening longer - Call your nearest store for details**

*FREE GIFT with every order! For ordering information and terms & conditions, see page 31.*

Convenient, well laid out stores. And of course, friendly, helpful staff!!



# NOT AVAILABLE IN THE SHOPS



*The fact is, you won't see an INFINITE PC in the shops; we build them, test them and ship direct to you and in this way retain total control of quality at every stage.*

*With every PC, as with everything you buy from SMC, you get something else you can't get in the shops, and that's our unique combination of the highest service at lowest prices.*

*Sure, your superstore chains may look glossy and claim low prices, but surely, by definition, a multi-site operation will lose out every time in focus on quality and operating efficiency to a centralised, national operation like SMC.*

*Your local dealer may give great personal service, but he (or she) just doesn't have the buying power to compete.*

*And as for the move by supermarkets into selling PCs...it seems to have about as much logic as SMC offering you a pound of carrots with your hard drive!*

*We are justifiably proud of our commitment to service and our reputation. That's why you should consider us as your PC source...because our offering is not available in the shops.*

## PRODUCT FINDER

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Prices effective from 8th day of month of publication.  
Whilst every effort is made to ensure accuracy, prices & specifications can be subject to change without notice.  
Please confirm details when ordering.  
E&OE : Errors & Omissions excepted.

**PC UPGRADES & SYSTEMS**



No. FS40989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

At SMC, as one of the UK's foremost suppliers of PC's and upgrades, we have built our business on our reputation for providing an utterly professional service at fiercely competitive prices.

Take a look at the product listings on these pages and we're sure you'll agree that with our established quality of operation coming free of charge, you won't find better value for your money.

## USEFUL INFORMATION

### HOW TO ORDER



#### BY TELEPHONE :

Call one of our FREE Sales Hotlines (given at the top of every right-hand page). We can give you details of product availability, process your order and start the shipment process while you wait.

#### BY FAX :

Fax us on 01753 - 524443 with your requirements and payment details and we'll process the order immediately. Please include a phone number !

#### BY POST :

Send us your requirements and payment for immediate attention. Uncovered personal cheques may take 10 working days to clear. Please include a phone number !

#### IN PERSON :

Personal callers are welcome, but you are advised to telephone and reserve stock beforehand, when you will be given a sales reference and given priority treatment when you arrive.

#### PLEASE NOTE :

SMC Computers has very strict payment security procedures which exist for everyone's benefit. We may call you to confirm details as part of this process.



### Welcome to the March edition of the SMC Catalogue !

As 1999 gets under way, we are seeing our sales levels reach record highs. Since before Christmas we have been operating at full stretch, and the commitment of our staff has been absolutely first-class. Despite the pressure, we have maintained our levels of service and it has been a matter of pride for many of us to start early and finish late to make sure that orders go out on time.

At the same time we've continued to review our operations and in February added more staff to Sales Support so we could cut delivery times where products are in short supply.

Thanks to everyone who's supporting us. We've got great things planned for the year ahead and, as our sales continue to increase, we're proving that giving a quality service is not only a solid route to success, but a very enjoyable way of earning a living!

Steve Warren

Managing Director

### NON-SALES HOTLINES

**CUSTOMER CARE  
SWITCHBOARD  
FAX**

**01753 550999  
01753 550666  
01753 535175**

### SMC Guarantees You Peace Of Mind

We appreciate that the products we sell are of a technical and sometimes confusing nature, and occasionally problems may arise, so for your peace of mind SMC offers you a unique **Four-Stage** guarantee :

- Stage 1 : Our 7 day option -** When you receive your purchase, if you are not completely satisfied, we will gladly exchange it or refund the purchase price less carriage charges.
- Stage 2 : Our 30 day option -** If any product that you order fails within 30 days, we will gladly exchange it or refund the purchase price less carriage charges.
- Stage 3 : Warranties -** Just arrange to return the product to us and we will handle it from there.
- Stage 4 : Quick response -** If you have need to use any of the above options, or if you have any problems that need resolving, please contact our Customer Service team on 01753 550999 for an immediate, no-fuss response.

So with this in mind, you can order from SMC with total confidence in the knowledge that every product will perform to your expectations -

#### OR WE WILL TAKE IT BACK

(Does not include: Notebooks, Printers, Software, made-to-order items such as Systems and cables, and items specially purchased.)

Goods must be returned intact and complete in their original packaging)  
(Full SMC Terms & Conditions are available on request)

**SALES FREEPHONES : South - 0800 597 5 333**

**Midlands - 0800 597 6 333**

**North - 0800 597 7 333**

**Scotland - 0800 597 8 333**

**FAX : 01753 524443**

VISIT OUR WEBSITE AT:

www.smcdirect.co.uk

E-MAIL:

sales@smcdirect.co.uk



SALES LINES OPEN : MONDAY TO FRIDAY : 8.30am - 6.30pm SATURDAY : 9am - 1pm

For Customer Care and Switchboard Hotlines see Page 2

THE BEST YOU'LL GET

### DIGITAL CAMERAS

#### OLYMPUS

ex VAT inc VAT

Olympus has used its renowned optical expertise to develop high resolution lenses that push the CCD's performance to the max! All cameras feature auto focus, built-in flash, 12s self timer & a TTL viewfinder. Supplied with interface cables & Olympus specialist software.

98-91-0840	<b>C840L</b> 1280x960 pixels (HQ/SHQ mode), 4Mb memory, 1.3million pixel CCD, LCD monitor, telephoto (36-72mm), Photoalbum software	£422	£495.85
98-91-0900	<b>C900 ZOOM</b> 1280x960 pixels (HQ/SHQ mode), 4Mb memory, 1.3million pixel CCD, LCD monitor, optical zoom (35-105mm)	£549	£645.08
98-91-1400	<b>C1400L</b> 1280x1024 pixels (Super HQ/HQ mode), 4Mb memory, 1,410,000 pixel CCD, LCD monitor, Zoom (36-110), Auto focus, Battery charger kit	£799	£938.83
98-91-1402	<b>C1400XL SLR</b> 1280x1024 pixels (HQ/SHQ mode), 4Mb memory, 1.4million pixel CCD, LCD monitor, on-screen display, 3x Zoom (36-110), Auto focus, Battery charger kit	£799	£938.83
70-91-0006	<b>C6AG</b> mains adaptor for complete range	£59	£69.33
19-91-0108	<b>M8PE</b> 8Mb Smartmedia Memory Card	£68	£79.90

#### EPSON

These cameras feature auto focus, built-in flash and a 10-sec timer. They run from AA batteries (supplied) with a mains adaptor optional. Interface cables & software supplied.

98-93-0600	<b>PC600</b> Camera 1024x768 pixels (XGA mode), 810,000 pixel CCD, 4Mb memory, Zoom focus.	£269	£316.08
70-93-7032	240 mains adaptor	£49	£57.58
19-93-8311	4Mb Memory module	£125	£146.88
98-93-0700	<b>PC700</b> Camera 1280x960 pixels (High Quality mode), 1.3 million pixel CCD, 4Mb memory, 200m focus	£293	£344.28

#### SONY

98-71-0051	<b>Mavica FD51</b> Camera 640x480 VGA, 380,000 pixel CCD, stores on to floppy	£339	£398.33
98-71-0071	<b>Mavica FD71</b> Camera 640x480 VGA, 380,000 pixel CCD, stores on to floppy, with 10x optical zoom, special picture effects built-in	£389	£457.08

#### HP HEWLETT PACKARD

98-28-0200	<b>Photosmart</b> Camera 1152 x 872 24-bit, 4MB memory, Runs on 4xAA batteries or mains adaptor (supplied) Autofocus with built-in flash. Software, cables supplied.	£299	£351.33
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#### UMAX

98-81-0100	<b>DC-F1</b> Camera 1920 x 1600 30-bit, 800,000 pixels, 2MB memory, built-in flash. Software, cables supplied.	£259	£304.33
98-81-0150	240 mains adaptor	£15	£17.63

### PHOTO PRINTERS

#### OLYMPUS

ex VAT inc VAT

Olympus digital printers support either parallel or direct printing. A cable and software are supplied for PC and MAC. Dye sublimation produces a higher quality image through lower resolution over standard printing.

99-91-0300	<b>P300E</b> 1376x1024, 16.7m colours using dye sublimation (306Dpi). Ideal for C-420L/820L/1400L Camera	£212	£249.10
96-91-6060	<b>P60N</b> A6 paper for P-300E PPrinter (x60)	£42	£49.35
99-91-0330	<b>P330E</b> Ultra high res dye sublimation printer work stand-alone or plug it into your TV for on-screen control	£339	£398.33
26-91-3305	<b>MA-ICE</b> PCMCIA adaptor (3.3 & 5v) for faster downloads	£59	£69.33
26-91-0144	<b>Flash Path</b> 3.5" floppy disk adaptor (3.3v & 5v)	£59	£69.33
96-91-3004	<b>B30Se</b> Ni-MH Batter Charger + 4 batteries	£68	£79.90
05-91-1700	Photoalbum Image Archive software on CD	£9	£10.58

#### EPSON

This product is supplied with cables and software. It is an external SCSI device that supports 35mm negatives and slides at 2400dpi and Photos at 300 dpi, 30 bit colour.

99-93-5191	<b>Epson Stylus Photo 720Dpi, 4"x6" - A4, 1ppm</b>	£145	£170.38
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#### EPSON Photo-600 Megapixel Camera

98-93-0600

**£269**

£316.08 inc. VAT



- Megapixel
- 1024x768 Resolution
- 9 shot continuous sequence
- JPEG compression
- 4Mb memory
- 2" TFT viewfinder
- PAL/TV OUT

#### EPSON

### PRODUCT LINK

**Inkjet Printers : See Page 28**

**Film Scanners : See Page 27**



Olympus C-900 ZOOM

98-91-0900

**£549**

£645.08 inc. VAT



Olympus C-1400XL

98-91-1402

**£799**

£938.83 inc. VAT

#### OLYMPUS

Olympus' leadership in optical technology started 20 years ago with their invention of the TAOS optical reader - used now in every CD player in the world. This led to developments in the digital arena where both quality and innovation are of paramount importance.

Olympus don't make ordinary cameras, they make cameras with style, and cameras that are market leaders in quality and cutting edge technology. If you want something special, Olympus is the choice to make.

DIGITAL CAMERAS

For SMC's unique guarantee : see page 2

SMC Direct is a trading division of : SMC Computers Plc

253-257 Farnham Rd Slough Berkshire SL2 1HA



ALL MAJOR CREDIT CARDS ACCEPTED



No. F540989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

## For a truly Personal Computer ...

While the systems listed below can usually be provided off-the-shelf, we also specialise in the production of made-to-measure PC's, designed and built to individual requirements. If you have a specific design in mind - or would simply like a quotation on a variation of a model you see below - just give one of our Sales Hotlines a call and one of our Technical Sales specialists will be happy to discuss what you need in terms of performance and price. Individually-built systems take around five working days to process fully, so if you call us today, within a week you could have a new PC that is exactly what you want, and because we don't charge for the extra service, it will be at a price you can afford.

INFINITE PC SYSTEMS

### LYNX C366

The Lynx can run all your business applications today and because of its ease of upgradability, when your business grows - it can grow with you.

- >> INTEL CELERON A 366MHz processor
- >> Upgradable to 466MHz with Socket 370
- >> INTEL's latest PII 440BX chipset
- >> 128k ON-CHIP level 2 cache
- >> 32MB fast SDRAM
- >> 4.3 GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 2MB 2D/3D AGP graphics
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£549**

£645.08 inc.VAT

### COUGAR 350

The Cougar has been designed as the ideal all-round Multimedia PC.

- >> INTEL Pentium II 350MHz processor
- >> Upgradability to 450MHz
- >> INTEL's latest PII440BX chipset
- >> 512KB Level 2 Cache
- >> 32MB super-fast 100MHz SDRAM
- >> 4.3 GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 4MB 2D/3D AGP graphics
- >> 64-bit sound with stereo speakers
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£649**

£762.58 inc.VAT

### PUMA 350

With network capability, the Puma is ideal for use as a workstation on either a conventional or peer-to-peer network.

- >> INTEL Pentium II 350MHz processor
- >> Upgradability to 450MHz
- >> INTEL's latest PII 440BX chipset
- >> 512KB Level 2 Cache
- >> 64MB super-fast 100MHz SDRAM
- >> 4.3GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 64-bit sound with stereo speakers
- >> 4MB 2D/3D AGP graphics
- >> Intel 10/100 Base-T Network card
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£719**

£844.83 inc.VAT

### JAGUAR 350

The Jaguar is an excellent all-round system with ample capacity for all business, games and multimedia applications.

- >> INTEL Pentium II 350MHz processor
- >> Upgradability to 450MHz
- >> INTEL's latest PII 440BX chipset
- >> 512KB Level 2 Cache
- >> 32MB super-fast 100MHz SDRAM
- >> 6.4GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 64-bit sound with stereo speakers
- >> 4MB 2D/3D AGP graphics
- >> 56Kbps V90 Fax/Modem
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£679**

£797.83 inc.VAT

### LEOPARD 350 BANSHEE

The Leopard is configured as the ultimate gaming solution.

- >> INTEL Pentium II 350MHz processor
- >> Upgradability to 450MHz
- >> INTEL's latest PII 440BX chipset
- >> 512KB Level 2 Cache
- >> 64MB super-fast 100MHz SDRAM
- >> 6.4GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 64-bit sound with stereo speakers
- >> 16MB 2D/3D AGP Voodoo Banshee gfx
- >> 56Kbps V90 Fax/Modem
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> G.Police, Incoming, Actua Soccer and Ultimate Race games
- >> 15" SVGA monitor

**£799**

£938.83 inc.VAT

### PANTHER 400 DVD

The Panther includes a DVD drive for playing back movies in crystal clear digital quality and for running the next generation of software.

- >> INTEL Pentium II 400MHz processor
- >> Upgradability to 450MHz
- >> INTEL's latest PII 440BX chipset
- >> 512KB Level 2 Cache
- >> 64MB super-fast 100MHz SDRAM
- >> 6.4GB Hard Drive
- >> 5-speed DVD-ROM drive
- >> MPEG2 decoder card
- >> 64-bit sound with stereo speakers
- >> 4MB 2D/3D AGP graphics
- >> 56Kbps V90 Fax/Modem
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£899**

£1056.33 inc.VAT

**HARDWARE** : Our product quality is the best because we control every stage of the process, and will only install major branded products into our systems.

**SOFTWARE** : In addition to Windows 98 operating system pre-installed, you have the option of special software upgrade offers at the time of purchase. Please discuss these with your sales contact, who will be pleased to advise you.

**SUPPORT** : With every Infinite system on this page, there's a full FIVE-YEAR warranty (the first year on-site (parts and labour), years 2-5 return to base, labour only) and 3 year warranty with every monitor. Extended on-site warranty options are available.

With the special PC Packages featured on Page 5, warranty is one year, return-to-base, covering both parts and labour, though on-site warranty can be arranged for a small additional charge. In addition, there's lifetime technical support on our dedicated hotline to give you complete peace of mind.

**Monitor options** : all system specifications on this page include an SVGA 15" monitor, but we can provide any monitor in our range. Obtaining a price for an alternative is easy : simply refer to the monitor listings on Page 26 and adjust for the difference in price.

**Infinite**  
Personal Computer

### CHEETAH 450 TNT

The Cheetah is our latest top-of-the-range PC, and it maintains our tradition of offering high-performance technology at extremely competitive prices.

- >> INTEL Pentium II 450MHz processor
- >> INTEL's latest PII 440BX chipset
- >> 512KB Level 2 Cache
- >> 64MB super-fast 100MHz SDRAM
- >> 8.4GB Hard Drive
- >> 32-speed CD-ROM drive
- >> 64-bit sound with stereo speakers
- >> 16MB AGP RIVA TNT graphics
- >> 56Kbps V90 Fax/Modem
- >> W95 105-key keyboard and mouse
- >> Windows 98 Operating System
- >> 15" SVGA monitor

**£1049**

£1232.58 inc.VAT

**NOTE** : Prices are given for systems collected from SMC. For delivery please add £25 + VAT (£29.38)

SMC Direct exists to provide a reliable service of the highest quality to all PC users, whether personal end-users, small businesses or large organisations. We invite you to benefit from our unique and total commitment to the highest standards of customer care.

**PRODUCT FINDER :**  
**SEE FRONT COVER**

**SALES FREEPHONES :** South - 0800 597 5 333

Midlands - 0800 597 6 333

North - 0800 597 7 333

Scotland - 0800 597 8 333

FAX : 01753 524443

VISIT OUR WEBSITE AT:

www.smcdirect.co.uk

E-MAIL:

sales@smcdirect.co.uk



SALES LINES OPEN : MONDAY TO FRIDAY : 8.30am - 6.30pm SATURDAY : 9am - 1pm

For Customer Care and Switchboard Hotlines see Page 2

THE BEST YOU'LL GET

## Infinite Personal Computer

At SMC, we have been building PC's for years, and we don't believe anyone can match our unique combination of high performance, flexibility and competitiveness. From the sales process, where trained, friendly and helpful staff can exactly match the specification to your needs and produce a quotation as you speak, to the final build process, we take a genuine pride in our work. Every PC is built on-site by our own staff : we do not sub-contract or "buy in" systems from third parties. Initial assembly is carried out by an individual engineer, fully "burned in" and then quality-checked by another engineer before being passed for shipment. Components used are all major-brand products with full specification and totally compatible and upgradable as technology moves on.

The INFINITE brand has been built strongly over the years on the basis of care and attention to detail, and a deliberate and unbroken rejection of so-called "box-shifter" principles. In this way we have developed a no-compromise approach to quality that will give you a PC you'll be both pleased and proud to own.

What's more, as with everything we do, getting a premium service from SMC doesn't mean you'll find anything added to the price.

### Software Upgrade options

Take advantage of these software upgrade options (available at the time of purchase only) to add even more value to your PC.

**Lotus SmartSuite** £19 £22.33 inc.VAT

**Microsoft Works** £19 £22.33 inc.VAT

**Microsoft Home Essentials**

£75 £88.13 inc.VAT

**Microsoft Office SBE**

£129 £151.58 inc.VAT

### Hardware Upgrade options

Upgrade the standard mouse and keyboard to :

**MS Natural Keyboard Elite & Intellimouse**

£20 £23.50 inc.VAT

## PC PACKAGES



### Home PC Plus 333

The ideal solution for the entry-level purchaser : not only do you get state-of-the-art technology, but with a Hewlett Packard Deskjet printer and the full Lotus SmartSuite office software, you're up and running in no time at all.

- >> AMD 300MHz K6/2 processor
- >> 32MB SDRAM
- >> 2MB 2D/3D graphics
- >> 64-bit sound with stereo speakers
- >> 3.2GB hard drive
- >> 32-speed CD-ROM drive
- >> 14" SVGA monitor
- >> Hewlett Packard Deskjet printer
- >> W95 105-key keyboard & mouse
- >> Microsoft Windows 98
- >> Lotus SmartSuite software

We don't think you'll find better value for money !

**£559**

£656.83 inc.VAT

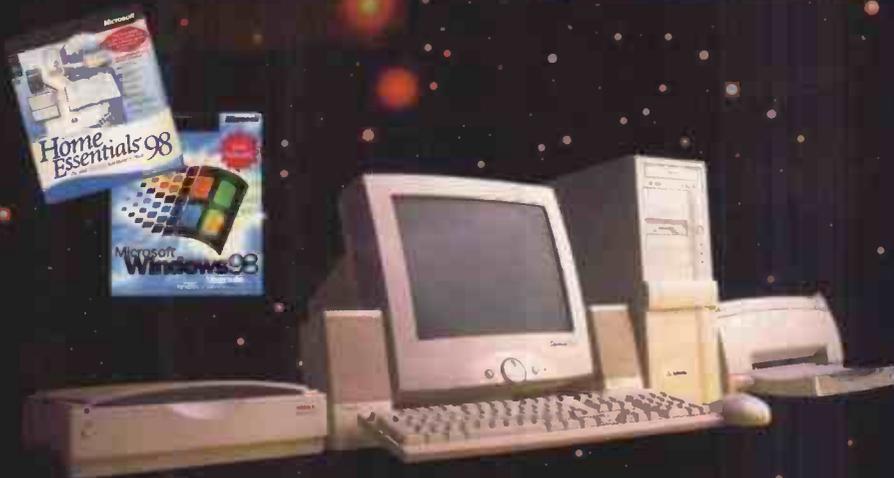
### Multimedia Publisher C366

Whether it's business, games or Internet access, this is the versatile solution for all needs. You'll also be able to scan images and text into your PC, adding a new dimension to both work and play.

- >> Intel 366MHz Celeron processor
- >> 128K ON-CHIP level 2 cache
- >> 32MB SDRAM
- >> 4MB 2D/3D graphics
- >> 64-bit sound with stereo speakers
- >> 56k V90 Fax/Modem
- >> 3.2GB hard drive
- >> 32-speed CD-ROM drive
- >> 14" SVGA monitor
- >> Hewlett Packard Deskjet printer
- >> Colour A4 Flatbed Scanner
- >> W95 105-key keyboard & mouse
- >> Microsoft Windows 98
- >> Microsoft Home Essentials software

**£789**

£927.08 inc.VAT



Software packaging shown for illustration purposes only

SMC Direct is a trading division of :

SMC Computers Plc

253-257 Farnham Rd Slough Berkshire SL2 1HA



ALL MAJOR CREDIT CARDS ACCEPTED

INFINITE PC SYSTEMS

For SMC's unique guarantee : see page 2

5



No. FS40989

**LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !****ISO9002**

Doesn't everyone claim to be committed to service ... even the ones who aren't? Yes. But the ISO9002 process sorts out those who mean it.

To gain accreditation, a company must break every aspect of its operation down and set up procedures based on producing, monitoring and improving service levels. At SMC, we cover not only the materials handling such as booking in, storage, picking and packing of goods but also the way in which orders are taken from customers and processed. In addition, we keep a check on how we deal with customer problems, and even our suppliers are under constant review to ensure their performance (and that of their products) maintains acceptable standards. The process is not only time-consuming and expensive, but it requires a constant and high level of discipline. Yet because of the inherent efficiency of the company, we are able to keep our prices as keen as ever and ensure that we keep our unrivalled commitment to service with prices that are among the keenest in the market.

**LG HANDHELD PC**

Nobody is further ahead in IT than LG. £1.5m is spent every day on R&D and £2.0bn is being invested in a manufacturing plant in Wales, ensuring LG Electronics' position as a leading player in a very exciting digital future.

**Totally portable computing****PHENOM (H120S) Handheld PC**

(As Shown)

94-26-1200 **£355** ( £417.13 inc.VAT)**PHENOM EXPRESS H22 C16**

(Not Shown)

94-26-2200 **£599** ( £703.83 inc.VAT)**LG****We put people first**Website <http://www.lge.co.kr>**SONY VAIO**

The ingenious and stylish design of this ultra-slim (24mm), B5-size Notebook means that full functionality is built in to a form that can be taken anywhere.

Not only does the Notebook weigh just 1.35kg (3lbs), but with external CD-ROM/floppy drives and GSM-ready 4in1 fax/modem PC card, you're ready to work & play wherever you are.

ex VAT inc VAT

**500 Series**94-74-0506 **VA10-505FX** **£1699** £1996.33

- >> 10.4" TFT display (800x600)
- >> Intel Pentium P266 MMX processor
- >> 32MB RAM (upgradable to 96MB)
- >> 4GB Hard Drive
- >> External CD-ROM & floppy drive
- >> 2MB video RAM
- >> 1 year warranty (extra 2 years on registration)

Includes FREE Earphones, port replicator (serial, parallel, VGA, PS/2 Mouse & Keyboard connections) & ships with Windows 98.

**700 Series**

- Features :
- >> Intel Pentium P266MMX processor
  - >> 32MB SDRAM (upgradable to 128MB)
  - >> 4GB Hard Drive
  - >> 512K cache
  - >> Windows 98 Installed
  - >> Internal bay for either CD-ROM & floppy drive
  - >> 2MB video RAM
  - >> 1 year warranty (extra 2 years on registration)

94-71-0745 **VA10-745** **£1129** £1326.5897-71-0746 **VA10-745LT** No modem included**£849** £997.5894-71-0747 **VA10-747** **£1289** £1514.58**DON'T FORGET :**

Kingston matched memory upgrades available

**FOR LIFETIME WARRANTY**

See page 10

**3COM PALM PILOT**

The 3Com Palm Pilot is a small (4.7" high), light (6oz) personal organiser. It stores data such as address details, and appointments and can even be used to send/receive email.

Perhaps the most powerful feature is the ability to exchange and update information direct from a PC at the touch of a button, including drag'n'drop into Microsoft Word and Excel.

Both models include date book, address book, mail, to do list, memo pad, expense, calculator, games and hotsynch.

You'll not find a better personal assistant for such a small outlay.

ex VAT inc VAT

94-90-0100 **Palm Pilot Professional**4000 addresses, 2400 appointments, 750 to do, 750 memos, 100 email **£145** £170.3894-90-0200 **Palm Pilot III**6000 addresses, 3000 appointments, 1500 to do, 1500 memos, 200 email, Advanced InfraRed Hotsynch **£199** £233.83**UMAX****The 'All-In-One' Solution**

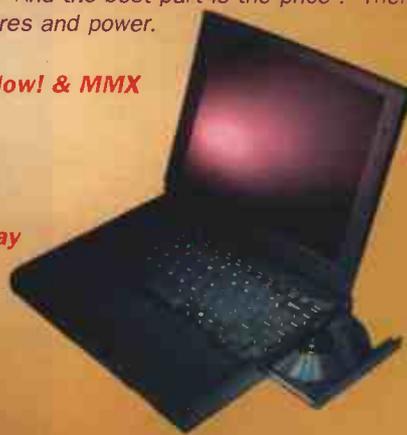
From the world's No 1 scanner manufacturer, the all new Umax ActionBook 330T is a powerful mobile tool - equipped with advanced features normally found only on higher-end notebooks, at a price so affordable it's beyond comparison. Truly an 'all-in-one' solution, with built-in hard drive, floppy drive and CD-ROM, the 330T eliminates the need to swop components or carry extra peripherals. With features like 12.1" TFT Active Matrix display and AMD-K6-2 processors with 3DNow!™ technology with MMX™, together with a performance that rivals most desktop systems, this is a compact design that can be carried anywhere. And the best part is the price! There simply isn't a portable with more built-in features and power.

- 300MHz AMD K6-2 processor with 3D Now! & MMX
- 32MB of RAM (Supports up to 96MB)
- 3.2Gb IDE hard disk drive
- 24x speed CD-ROM drive
- 1.44MB Floppy Drive
- 12.1", 800x600 built-in SVGA TFT display

94-81-0330

**£899**

£1056.33 inc. VAT

**COMPAQ ARMADA**

As the inventor of the very first portable PC, Compaq has spent more than a decade studying mobile computing needs. With unrivalled business expertise, Compaq have assembled the Armada as a formidable range of eye-catching, state-of-the-art and affordable all-round business solutions.

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**1700 Series**

- Features :
- >> 32MB RAM (upgradable to 96MB)
  - >> 4GB Hard Drive
  - >> 24-speed CD-ROM

94-09-6233 **6233T-W95** **£1159** £1361.83

- >> 12.1" TFT display
- >> Intel Mobile Pentium II 233MHz processor
- >> Microsoft Windows 95 installed

94-09-6238 **6233T-W98** **£1199** £1408.83

- >> 12.1" TFT display
- >> Intel Mobile Pentium II 233MHz processor
- >> Microsoft Windows 98 installed

94-09-6266 **6266T-W95** **£1599** £1878.83

- >> 13.3" TFT display
- >> Intel Mobile Pentium II 266MHz processor
- >> Microsoft Windows 95 installed

**7800 Series**

- Features :
- >> 13.3" TFT display
  - >> Intel Mobile Pentium II 266MHz processor
  - >> 64MB RAM (upgradable to 160MB)
  - >> 5GB HD and 20-speed CD-ROM

94-09-7895 **7800-W95** **£2149** £2525.08

- >> Windows 95 installed

94-09-7800 **7800-WNT** **£2199** £2583.83

- >> Windows NT installed

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### Longer Life, Lower Cost, ONE SOLUTION

Extending the life of your technology investment and reducing the total cost of ownership has never been easier. The Tecra 8000 Series' new flexible hardware design utilizes a standard platform with a single motherboard, system BIOS and graphics architecture that enable you to customize or expand your system while using the same system software image. This simplifies planning and procurement, and provides for seamless technology transition.

### Configuration Flexibility in a Notebook? . . . A NEW ERA

Being the first to market with unique products is not new to Toshiba. But that doesn't mean we don't get excited about exceptional advances in technology. And the revolutionary Tecra 8000 Series is no exception. It's the industry's first notebook configured to your specifications, and it will change the way businesses think about choosing and managing their portable computers.



**LIMITED OFFER - UNTIL 31ST MARCH 1999**

Toshiba Tecra 8000 models with either a 266 or 300 MHz processor are available with either Windows 95/98 or Windows NT preinstalled for the same price.

	ex VAT	Inc VAT
94-75-8953	<b>£1359</b>	
>> Intel Pentium II 233MHz processor >> 12.1" STN display >> 32MB SDRAM (256MB upgradable) >> 3.82GB Hard Drive >> 24-speed CD-ROM drive		
94-75-8954	<b>£1549</b>	£1820.08
>> Intel Pentium II 233MHz processor >> 12.1" TFT display >> 32MB SDRAM (256MB upgradable) >> 3.82GB Hard Drive >> 24-speed CD-ROM drive		
94-75-8955	<b>£2025</b>	£2379.38
>> Intel Pentium II 266MHz processor >> 13.3" TFT display >> 64MB SDRAM (256MB upgradable) >> 6GB Hard Drive >> 24-speed CD-ROM drive		
94-75-8956	<b>£2289</b>	£2689.58
>> Intel Pentium II 300MHz processor >> 13.3" TFT display >> 64MB SDRAM (256MB upgradable) >> 6GB Hard Drive >> 24-speed CD-ROM drive		
94-75-8957	<b>£2699</b>	£3171.33
>> Intel Pentium II 300MHz processor >> 14.1" TFT display >> 64MB SDRAM (256MB upgradable) >> 7.63GB Hard Drive >> 2-speed DVD/20-speed CD-ROM drive		

## TOSHIBA PORTEGE

With a footprint smaller than an A4 sheet of paper, the Portege range is specifically designed for ultimate lightweight portability as well as quality, high performance and functionality. All Porteges include a 3 year warranty.

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94-75-7010 **7010CT** **£1949** £2290.08

**Features :** >> 300MHz Intel Pentium II processor  
 >> 32MB SDRAM (160MB upgradable)  
 >> 3.82GB Hard Drive  
 >> 12.1" 800x600 display

94-75-3010 **3010CT** **£1359** £1596.83

**Features :** >> 266MMX Pentium processor  
 >> 32MB SDRAM (96MB upgradable)  
 >> 4GB Hard Drive  
 >> 10.4" TFT display with 2MB VRAM

## TOSHIBA ACCESSORIES

We supply Toshiba brand accessories for all the current range of notebooks. They range from power supplies to docking stations, including modems, GSM upgrade kits, carry cases and hard drive upgrades. Please call for details.

## TOSHIBA SATELLITE

The Satellite range provides not only value for money without compromising performance, but also versatility in helping you tailor your choice to meet the needs of your applications. All Satellites include a 1 year warranty.

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### 4000 Series

**Features :** >> 32MB SDRAM (160MB upgradable)  
 >> 3.82GB Hard Drive  
 >> Built-in FDD and 24-speed CD-ROM  
 >> 2MBVRAM  
 >> 304 x 239 x 54mm : weighs 3.18kg

94-75-8951 **4000CDS** **£925** £1086.88

**Features** above specifications with :  
 >> 12.1" STN display  
 >> Intel Pentium II P233MHz processor

94-75-8952 **4000CDT** **£1165** £1368.88

**Features** above specifications with :  
 >> 12.1" TFT display  
 >> Intel Pentium II P233MHz processor

94-75-4010 **4010CDS** **£1039** £1220.83

**Features** above specifications with :  
 >> 12.1" STN display  
 >> Intel Pentium II P266MHz processor

94-75-4011 **4010CDT** **£1229** £1444.08

**Features** above specifications with :  
 >> 12.1" TFT display  
 >> Intel Pentium II P266MHz processor

## TOSHIBA LIBRETTO

Weighing less than two pounds, the Libretto is the world's smallest fully-functional Windows 95 PC. Includes a 1 year warranty.

ex VAT Inc VAT

94-75-0100 **100CT** **£959** £1126.83

**Features :** >> Intel Pentium P166MMX processor  
 >> 32MB EDO RAM (64MB upgradable)  
 >> 2.02GB Hard Drive and external 3.5" FDD  
 >> 7.1" TFT display with 2MB VRAM PCI graphics

94-75-0110 **110CT** **£1129** £1326.58

**Features :** >> Intel Pentium P233MMX processor  
 >> 32MB EDO RAM (64MB upgradable)  
 >> 4GB Hard Drive and external 3.5" FDD  
 >> 7.1" TFT display with 2MB VRAM PCI graphics

## TOSHIBA WARRANTIES

Extra 2-year international cover is available for Toshiba notebooks as follows :

ex VAT Inc VAT

94-75-9901 **Libretto**  
 100CT, 110CT **£130** £152.75

94-75-9903 **Satellite**  
 4000CDS, 4000CDT,  
 4010CDS, 4010CDT **£130** £152.75

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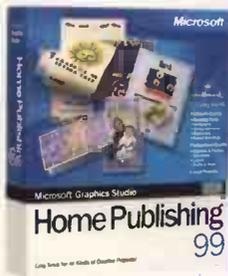
## UTILITIES

	ex VAT	inc VAT
<b>MICROSOFT</b>		
05-50-9809 Windows 98 Plus pack	£27	£31.73
<b>ONTRACK</b>		
Software supplied on floppy disk. OEM versions supplied with Hard Drive only		
01-93-8642 Disk Manager OEM	£15	£17.63
01-93-8644 Disk Manager Retail	£35	£41.13
01-93-8402 Drive Rocket OEM	£12	£14.10
01-93-8404 Drive Rocket Retail	£17	£19.98
<b>POWERQUEST</b>		
01-94-0002 Partition Magic	£39	£45.83
01-94-0030 Drive Image for backup/recovery	£39	£45.83
01-94-0035 Drive Image Pro Drive Data cloning	£398	£467.65
<b>NORTON</b>		
01-95-0103 Utilities V8	£88	£103.40
05-95-9503 Utilities - WIN 95 V3	£35	£41.13
05-95-9540 Utilities - NT	£63	£74.03
05-95-9065 PC Anywhere 8	£92	£108.10
05-95-9510 ACT V4	£125	£146.88
05-95-9515 Visual Cafe for Java	£59	£69.33
05-95-9520 SystemWorks	£65	£76.38
05-95-9525 Your Eyes Only	£55	£64.63
05-95-9530 WinFax Pro	£69	£81.08
05-95-2000 Year 2000 Toolkit	£35	£41.13
<b>QUARTERDECK</b>		
05-95-0202 Partition-It Ex.Strength	£38	£44.65
05-95-0213 Real Help Ex.Strength	£28	£32.90
05-95-0221 VirusSweep	£12	£14.10
05-95-0219 Cleansweep Deluxe	£30	£35.25
<b>McAFEE</b>		
05-97-0123 PC Medic International	£24	£28.20
05-97-0109 PC Medic Int. Deluxe	£29	£34.08
05-97-0102 Nuts & Bolts	£28	£32.90
05-97-0105 Nuts & Bolts Deluxe	£34	£39.95
05-97-0320 Hurricane 98	£21	£24.68
05-97-0107 Safe & Sound Internat.	£16	£18.80
05-97-0550 PGP Personal Edition -2 user license	£21	£24.68
<b>IBM</b>		
05-91-0410 Via Voice Home Edition	£33	£38.78
05-91-0420 Via Voice Executive Edition	£84	£98.70
<b>DRAGON</b>		
05-95-0320 Dragon Dictate Lite	£29	£34.08
05-95-0310 Dragon Dictate Point & Spea	£33	£38.78
<b>JASC</b>		
05-96-1000 Paintshop Pro V5	£55	£64.63
<b>XEROX</b>		
05-95-8450 TextBridge Pro OCR	£55	£64.63

We can also provide a range of McAfee Multi-node user licence products from 5-node through to 250-node.

Multi-node products offered include:-  
Total Virus Defense, VirusScan Security Suite, Internet Security Suite, VirusScan, WebScanX, Nuts&Bolts, PGP Desktop and Server Suite along with PGP Total Network Security Suite.

Prices and node levels vary - please call with your requirements.



**Microsoft Home Publishing 99**  
05-50-4050 **£33**  
**£38.78 Inc.VAT**

**Microsoft Project 98**  
Project Management Software

### Microsoft Project 98

Control your projects with confidence ! With a flexible, new scheduling engine, you can not only plan and track your projects, but you can identify and respond to conflicts before they happen.

Presentation features include intranet/internet publishing ability and communication with team members via E-mail or the Web.

Full compatibility with MS Office, as well as other databases and systems, mean you'll be up and running, and sharing data, in no time at all.

05-50-6198  
**£299** £351.33 inc.VAT

**Microsoft FrontPage 98**  
Web Site Creation and Management Tool

### Microsoft FrontPage 98

Easy-to-use, leading-edge features allow you to create great-looking Web sites without programming.

Comprehensive management tools let you quickly build, organise and maintain Web sites.

Get a complete picture of your site. Five different FrontPage views combine to let you quickly plan, manage, and update your site.

Seamless integration with existing content and your desktop applications means that you're productive from the start.

05-50-7157  
**£88** £103.40 Inc.VAT

**Microsoft Office 97**  
Small Business Edition

### Microsoft Office 97

Microsoft Office is now probably the standard package for business today. Applications within the package have been updated and completely revised, and integration with Microsoft Explorer Web Browser adds another dimension to your productivity.

If you currently use any version of MS Word, MS Excel, MS Access, MS Powerpoint or MS Works then you are able to purchase an Upgrade version, and get full functionality for an even lower price.

05-50-3117  
**£326** £383.05 Inc.VAT

## PROGRAMMING LANGUAGES

	ex VAT	inc VAT
<b>MICROSOFT</b>		
05-50-3313 Visual FoxPro Std V3	£119	£139.83
05-50-9520 Visual Basic V6	£61	£71.68
05-50-9510 Visual Basic Pro V6	£325	£381.88
05-50-9530 Visual Basic V6 Enterprise Edition	£769	£903.58
05-50-9011 Visual J++ V1.1	£65	£76.38
05-50-9017 Visual C++ V5	£65	£76.38
05-50-9119 Visual C++ V5 Enterprise Edition	£749	£880.08
05-50-9049 Visual Interdev V1	£329	£386.58
05-50-9020 Visual C++ V6	£62	£72.85
05-50-9125 Visual C++ V6 Pro	£325	£381.88
05-50-9120 Visual C++ V6 Enterprise Edition	£772	£907.10

	ex VAT	inc VAT
05-50-9065 Visual Studio V6 Enterprise Edition	£947	£1112.73
05-50-9067 Visual Studio V6 Enterprise Upgrade	£635	£746.13
<b>BORLAND</b>		
05-94-0328 C++ Builder 3	£73	£85.78
05-94-0329 C++ Builder 3 Professional	£325	£381.88
05-94-0330 C++ Builder V3 Professional Upgrade	£219	£257.33
05-94-0474 JBuilder Standard	£72	£84.60
05-94-0491 JBuilder Professional	£359	£421.83

	ex VAT	inc VAT
05-94-0537 Delphi V3 Professional	£325	£381.88
05-94-0593 Delphi V3 Professional Upgrade	£219	£257.33
05-94-0540 Delphi V4 Professional	£399	£468.83
05-94-0595 Delphi V4 Professional Upgrade	£225	£264.38
05-94-0698 Visual dBase V7 Professional	£219	£257.33
05-94-0698 Visual dBase V7 Professional Upgrade	£219	£257.33

## BACKUP SOFTWARE

	ex VAT	inc VAT
<b>CHEYENNE</b>		
Arcserve IT 6 for Netware Server based, supports DOS, OS/2, Windows 3.x and Windows 95 workstations (optional support packs for UNIX, Macintosh and Windows NT Servers and Workstations), improved support for NetWare 4.1, with an improved Windows 95 style user interface.		
01-90-6600 Single Server	£279	£327.83
01-90-6630 Workgroup Edition (up to 7 servers)	£299	£351.33
01-90-6650 Enterprise edition Unlimited servers	£699	£821.33

	ex VAT	inc VAT
<b>Arcserve 6.5 for Windows NT</b> Supports Windows NT, '95 and 3.x. clients (optional agents available for NetWare, UNIX, OS/2 and Macintosh). Windows NT 4.0 compatible, with a built in Virus Scanner.		
01-90-6640 Workgroup Edition	£249	£292.58
01-90-6660 Professional Pack (when added to Workgroup Edition forms Enterprise Edition)	£199	£233.83

	ex VAT	inc VAT
<b>SEAGATE SOFTWARE</b>		
01-13-0360 Windows 95/98 single workstation, includes Job Scheduling & full/incremental backups	£55	£64.63
01-13-0331 Windows NT 4.0 Single Server edition	£292	£343.10
01-13-0500 Windows NT 4.0 Workstation edition, includes Job Scheduling, true 32-bit backup to a host of devices	£119	£139.83

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<b>MULTIMEDIA EDUCATIONAL</b>			
05-50-5213	Composer Collection	£32	£37.60
05-50-7103	Musical Instruments	£19	£22.33
05-95-7151	Oceans	£19	£22.33
05-50-0112	Encarta Reference Suite 99 - UK	£68	£79.90
05-50-0111	Encarta 99 Deluxe UK	£53	£62.28
05-50-0110	Encarta 99 UK	£32	£37.60
05-50-0118	Encarta World Atlas 99 - UK	£31	£36.43
05-50-5445	Magic School Bus - Rainforest	£23	£27.03
05-50-5450	Magic School Bus - Dinosaurs	£23	£27.03
05-50-5455	Magic School Bus - Inside Earth	£23	£27.03
05-50-5465	Magic School Bus - Oceans	£23	£27.03
05-50-5430	Personal Tutor - Year 2-4	£22	£25.85
05-50-5435	Personal Tutor - Year 1-2	£22	£25.85
05-50-5440	Personal Tutor - Preschool	£22	£25.85
05-50-5425	Creative Writer 2	£22	£25.85
<b>MULTIMEDIA GENERAL</b>			
05-50-0122	Autoroute Express GB 98- Windows 95	£37	£43.48
05-50-0121	Autoroute Express Europe 98-Win 95	£37	£43.48
05-95-7047	Cinemania 97	£19	£22.33
<b>OTHERS</b>			
05-50-5153	Animals of Sandiago Zoo	£12	£14.10
05-50-5133	Arthur's Teacher Trouble	£16	£18.80
05-50-5410	Playskool Fun Pack	£16	£18.80
05-50-5415	Mr Potato Head Activity	£16	£18.80
05-50-5420	A.D.A.M - Inside Story	£25	£29.38

GAMES		ex VAT	inc VAT
<b>For Windows 95</b>			
<b>MICROSOFT</b>			
05-50-0175	Chaos Island	£19	£22.33
05-50-0131	Age of Empires	£18	£21.15
05-50-0129	Close Combat 2	£25	£29.38
05-50-0133	CART Precision Racing	£18	£21.15
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05-50-0170	Revenge of Arcade	£15	£17.63
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05-50-0140	Combat Flight 5im	£27	£31.73
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05-95-1101	WarLords 3	£28	£32.90
05-95-1104	Commandos - B.E.L.	£28	£32.90
05-95-1105	UNREAL	£29	£34.08
05-95-1106	Ground Zero for Quake II	£17	£19.98
05-95-1107	Creatures 2	£27	£31.73
05-95-1110	Barrage	£23	£27.03
05-95-1111	Rainbow 6	£24	£28.20
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05-95-1113	Settlers 3	£25	£29.38
05-95-1114	Gangsters: Organised Crime	£27	£31.73
05-95-1115	Newman Haas Racing	£29	£34.08
05-95-1116	Grim Fandango	£29	£34.08
05-95-1117	Railroad Tycoon II	£27	£31.73
05-95-1118	SIN	£29	£34.08
05-95-1119	Links 99	£27	£31.73
05-95-1120	Thief: Dark Project	£27	£31.73
05-95-1121	Tomb Raider 3	£27	£31.73
05-95-1123	Heretic 2	£29	£34.08
<b>NEW RELEASES</b>			
05-95-1125	Fallout 2	£28	£32.90
05-95-1126	Powerslide	£25	£29.38
05-95-1127	Magic & Mayhem	£28	£32.90
05-95-1124	Baldur's Gate	£28	£32.90

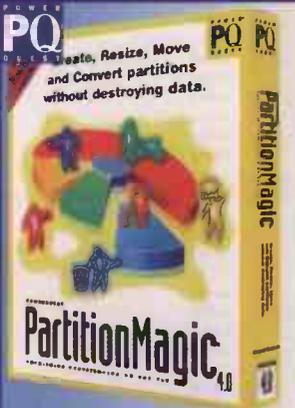
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<b>MICROSOFT</b>			
05-50-1210	Money 99	£19	£22.33
05-50-1220	Money 99 Financial Suite	£32	£37.60
05-50-7157	FrontPage 98	£88	£103.40
01-50-3155	Word 97	£222	£260.85
05-50-3117	Office 97	£326	£383.05
05-50-3113	Office V4.2	£325	£381.88
05-50-3177	Office Professional 97	£419	£492.33
05-50-9702	Office Small Business Edition (SBE) 97 - V2	£329	£386.58
05-50-2405	BackOffice Small Business Server 4 +5 users	£879	£1032.83
05-502425	BackOffice Small Business Server 4 + 25 users	£1529	£1796.58
05-50-3235	Excel 97	£229	£269.08
01-50-3197	Access 97	£222	£260.85
01-50-3357	Powerpoint 97	£229	£269.08
01-50-9109	Publisher 98	£67	£78.73
05-50-6198	Project 98	£299	£351.33
05-50-4010	Graphics Studio Greetings 99	£22	£25.85
05-50-4030	Graphics Studio Picture It 99	£33	£38.78
05-50-4050	Graphics Studio Publishing 99	£33	£38.78
05-50-4070	Graphics Studio Publishing Suite 99	£44	£51.70
05-50-0050	Works Deluxe	£42	£49.35
05-50-1091	Proxy Server 1.x	£639	£750.83
05-50-1095	Exchange Server +10 clients licences	£910	£1069.25
05-50-3182	Office 97 Developers edition	£519	£609.83
05-50-3202	Site Server 32 Standard Edition	£995	£1169.13

BUSINESS APPLICATIONS		ex VAT	inc VAT
05-50-6505	SQL Server 6.5 +5 client licences	£945	£1110.38
05-50-9299	Home Essentials 98	£75	£88.13
05-50-0045	Works v4.5	£59	£69.33
05-50-2000	Photodraw 2000	£95	£111.63
<b>Upgrade Packages</b>			
05-50-9707	Office 97 SBE (CCP)	£148	£173.90
05-50-3137	Office Std - Office 97 (CCP)	£149	£175.08
05-50-3157	Office Pro - Office Pro 97 (CCP)	£205	£240.88
01-50-9798	Publisher 97 to 98	£32	£37.60
05-50-6798	Project 98	£115	£135.13
05-50-0060	Works Suite	£75	£88.13
<b>LOTUS</b>			
05-91-0107	Smartsuite 97 for Windows 95	£290	£340.75
05-91-0305	Notes 4.x Full Client	£229	£269.08
05-91-7536	CCMail R8 Advanced	£339	£398.33
05-91-0201	Lotus Smartsuite Millennium Edition	£299	£351.33
<b>COREL</b>			
05-95-9808	Corel Draw 8	£255	£299.63
05-95-9818	Corel Draw 8 Upgrade	£135	£158.63
<b>ADOBE</b>			
05-93-0003	Acrobat 3	£125	£146.88
05-93-1005	Photoshop 5	£379	£445.33
05-93-2008	Illustrator 8	£229	£269.08
<b>OTHERS</b>			
05-91-1700	Olympus Photoalbum	£9	£10.58
05-90-0098	AutoCAD LT 98	£429	£504.08
05-90-0198	AutoCAD LT 98 Upgrade	£149	£175.08

OPERATING SYSTEMS		ex VAT	inc VAT
<b>MICROSOFT</b>			
<b>Full Versions</b>			
05-50-9800	Windows 98 (Requires DOS)	£112	£131.60
05-50-9807	Windows 98 OEM *	£89	£104.58
05-50-1013	Windows NT 4.0 Workstation	£215	£252.63
05-50-1017	Windows NT 4.0 Server + 5 clients	£542	£636.85
05-50-1018	Windows NT 4.0 Client license	£29	£34.08
05-50-2435	Back Office Server	£1539	£1808.33
<b>Upgrades</b>			
05-50-9598	Windows 3.1/95 to 98	£59	£69.33
05-50-1015	Windows NT V3.51 to V4 Upgrade	£105	£123.38
05-50-9309	Windows NT Server + 5 clients V3.51 TO V4.x	£279	£327.83

ANTI-VIRUS		ex VAT	inc VAT
<b>Dr. SOLOMON'S</b>			
<b>Anti-Virus Toolkit</b>			
01-93-0114	1 Year cover, 4 updates	£69	£81.08
01-93-1112	1 Year cover, 12 updates	£124	£145.70
01-93-1304	3 Year cover 4 updates p.a.	£129	£151.58
Anti-Virus Toolkit is designed for single user computers running any of the following: DOS/Windows 3.1x, 95, NT and OS/2. License packs and server versions for Novell Netware/Windows NT Server are also available.			
<b>NORTON</b>			
<b>Anti-Virus</b>			
01-95-9103	For Windows 3.1x	£65	£76.38
01-95-9535	V5 for Win 95/98	£29	£34.08
<b>McAfee</b>			
<b>Virus Scan V4</b>			
05-97-0326	Security Suite	£44	£51.70
05-97-0327	WebScanX standalone	£18	£21.15
05-97-0407	Standard, 4 updates	£19	£22.33
05-97-0423	Deluxe, 4 updates	£25	£29.38

\* 05-50-9807 (Win98 OEM) must be purchased with a new Hard Drive : it does not include Microsoft Support, however it can be updated via the Windows 98 Update on the Web.



**PowerQuest Partition Magic**

Run Windows 98 and Windows 95 on the same PC!  
 Partition Magic 4.0 makes it easy to run multiple operating systems on the same machine without compatibility problems. Using IBM's Boot Manager, it is possible to select an operating system on startup. So you can explore the possibilities of, say, Windows NT while using your existing operating system for your main applications. Create a separate partition for data files you wish to protect from unauthorised use, corruption by unstable packages, or to simplify data backup. Save disk space too : up to 40% of hard drive space can be wasted, and Partition Magic 4.0 restructures partitions and cluster sizes so you get the most from your disk.

01-94-0002 **£39** £45.83 inc.VAT



**PowerQuest Drive Image**

Drive Image is an easy to use, fast, and comprehensive solution for fast backup, upgrades and even system recovery. Create a complete backup of your hard drive in minutes, on to removable media such as Zip, Jaz or Syquest. Restore via a simple click of the mouse. Drive Image also checks for disk integrity and looks for bad sectors to prevent data loss. With Drive Image Professional, you can extend this functionality to multiple workstations, vastly simplifying and reducing the cost of network management.

PowerQuest Drive Image 01-94-0030 **£39** £45.83 inc.VAT  
 PowerQuest Drive Image Pro 01-94-0035 **£398** £467.65 inc.VAT

**SMC Direct is a trading division of : SMC Computers Plc**

**253-257 Farnham Rd Slough Berkshire SL2 1HA**



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No. FS40989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY!

IF ALL MEMORY IS THE SAME, WHY DO SOME BRANDS FAIL MORE OFTEN THAN OTHERS?

With Kingston memory, you know it's going to work. You also know that it'll stay working, year after year.

That's why you get both a 100% guarantee of compatibility and a lifetime warranty against failure.

And because Kingston have been giving the same backup for years, they have built their position as the undisputed leader in the manufacture of quality-assured memory upgrades.

This all fits in well with SMC's strategy, and in providing the same dedication to service and quality, we're pleased to be not only a very close partner with Kingston Technology, but also one of the biggest sellers of their product in the UK.

## Kingston TECHNOLOGY

MANUFACTURES MEMORY FOR NEARLY EVERY PC, NOTEBOOK, SERVER AND PRINTER IN USE TODAY.



### KINGSTON MATCHED MEMORY

### KINGSTON GENERIC MEMORY

Part No	ex VAT	inc VAT	Part No	ex VAT	inc VAT
<b>Intel</b>			<b>Digital</b>		
440LX Motherboards Non-ECC			Digital Minote VP 520, 525, 535		
32MB KTM66X64/32	£42	£49.35	16MB KTV-VP500/16	£39	£45.83
64MB KTM66X64/64	£112	£131.60	32MB KTV-VP500/32	£68	£79.90
128MB KTM66X64/128	£214	£251.45	<b>Hewlett Packard</b>		
440LX Motherboards ECC			Pavilion 7270, 7275, 7280P, 7285, 7295V		
32MB KTM66X72/32	£52	£61.10	16MB KTH-VL4/16	£33	£38.78
64MB KTM66X72/64	£123	£144.53	32MB KTH-VL4/32	£67	£78.73
128MB KTM66X72/128	£239	£280.83	64MB KTH-VL4/64	£130	£152.75
<b>Compaq</b>			Laserjet 4000s and 5000s		
DeskPro 2000, 4000, 6000 series			16MB KTH-LJ4000/16	£28	£32.90
16MB KTC2430/16	£33	£38.78	16MB KTH-LJ4000/16	£36	£42.30
32MB KTC2430/32	£67	£78.73	32MB KTH-LJ4000/32	£59	£69.33
64MB KTC2430/64	£130	£152.75	Vectra VL7		
Armada 7000 series D/MT, 1500 series D/MT, 1130/T			16MB KTH536/1/16	£28	£32.90
16MB KTC272/1/16	£34	£39.95	32MB KTH536/1/32	£49	£57.58
32MB KTC272/1/32	£61	£71.68	64MB KTH536/1/64	£112	£131.60
64MB KTC272/1/64	£117	£137.48	Kayak XA PII, Vectra VEB, VL8		
Deskpro 2000, 4000, 6000 MMX Series			32MB KTH6501/32	£56	£65.80
16MB KTC2428/1/16	£25	£29.38	64MB KTH6501/64	£103	£121.03
32MB KTC2428/32	£42	£49.35	<b>IBM</b>		
64MB KTC2428/64	£87	£102.23	Thinkpad 760 series, ELDs.560s, 360s, 380s		
128MB KTC2428/128	£167	£196.23	16MB KTM760ELD/16	£28	£32.90
Deskpro EN, EP SDRAM 100MHz (non ECC)			32MB KTM760ELD/32	£62	£72.85
32MB KTC661/1/32	£56	£65.80	Thinkpad 770		
64MB KTC661/1/64	£98	£115.15	16MB KTM-TP770/16	£28	£32.90
128MB KTC661/1/128	£180	£211.50	32MB KTM-TP770/32	£58	£68.15
Deskpro EN, EP SDRAM 100MHz			64MB KTM-TP770/64	£99	£116.33
32MB KTC6615/32	£61	£71.68	Aptiva 2137 E series		
64MB KTC6615/64	£109	£128.08	16MB KTM2137/16	£28	£32.90
128MB KTC6615/128	£205	£240.88	32MB KTM2137/32	£48	£56.40
Proliant 1600 Server			64MB KTM2137/64	£112	£131.60
32MB KTC3614/64	£133	£156.28	Aptiva L, C & S series 2136 E series		
64MB KTC3614/128	£245	£287.88	16MB KTM7318/16	£33	£38.78
<b>Dell</b>			32MB KTM7318/32	£67	£78.73
Performance 425L/M, 433L/M, 433S L/M, 450 L/M, 466L/M			64MB KTM7318/64	£130	£152.75
Latitude 433 M/MC, 450 M/C/MCX, 475 M/C/D, LX4100 D/T			PC300GL (6561, 6591), Aptiva 2142, 2140		
Omniplex 433, 450, 466, 4100 ME			32MB KTM0069/32	£48	£56.40
4MB KTD-LMT/4	£11	£12.93	64MB KTM0069/64	£112	£131.60
8MB KTD-LMT/8	£18	£21.15	128MB KTM0069/128	£209	£245.58
16MB KTD-LMT/16	£23	£27.03	PC300PL (6562, 6592)		
Dimension XPS P100t, P100C, P120C, P133C, XPS PRO 150n, 180n			32MB KTM0076/32	£64	£75.20
Dimension XPS P60, P75, P90			64MB KTM0076/64	£112	£131.60
Optiplex XL/XM/XMT 575, 590, 5100, 5120, 5133			128MB KTM0076/128	£214	£251.45
Optiplex GL/GM/GMT 575, 590, 5100, 5120, 5133, 5166			Netfinity 3000 SDRAM 100MHz		
Optiplex GXL/GXM/GXMT 590, 5100, 5120, 5133, 5150, 5166			32MB KTM1133/32	£58	£68.15
Optiplex Gs/LGs/Ms/GMT 5133, 5166, 5200			64MB KTM1133/64	£115	£135.13
16MB KTD-NPOP/16	£33	£38.78	128MB KTM1133/128	£221	£259.68
32MB KTD-NPOP/32	£43	£50.53	PC300PL (Pentium II) SDRAM 100MHz		
64MB KTD-NPOP/64	£78	£91.65	32MB KTM1136/32	£53	£62.28
Dimension P133v, P166v, P200v			64MB KTM1136/64	£103	£121.03
Dimension XPS P133s, P166s, M166s, M200s			128MB KTM1136/128	£199	£233.83
8MB KTD-SDRAM/8	£46	£54.05	<b>Toshiba</b>		
16MB KTD-SDRAM/16	£31	£36.43	Tecra 750s, Portege 650, 660s		
32MB KTD-SDRAM/32	£50	£58.75	32MB KTT650/32	£56	£65.80
Optiplex GXPRO series			64MB KTT650/64	£100	£117.50
16MB KTD-GXPRO/16	£39	£45.83	128MB KTT650/128	£249	£292.58
32MB KTD-GXPRO/32	£65	£76.38	Portege 610 CT, Satellite 110CS/CT, 115CS, 200CDS, 205CDS		
64MB KTD-GX/16	£133	£156.28	Satellite Pro 420/425/430 CDS/CDT		
128MB KTD-GXPRO/128	£214	£251.45	8MB KTT610/8	£25	£29.38
Optiplex GXA series (non-parity)			16MB KTT610/16	£37	£44.48
32MB KTD-GXAN/32	£53	£62.28	32MB KTT610/32	£61	£83.43
Optiplex GXA series (ECC)			Tecra 500 & 510 CDS/CDT		
32MB KTD-GXA/32	£53	£62.28	Satellite Pro 440, 445, 460, 470, 480 CDX/CDT		
64MB KTD-GXA/64	£108	£126.90	32MB KTT500/32	£65	£76.38
128MB KTD-GXA/128	£209	£245.58	48MB KTT500/48	£90	£105.75
Optiplex GXI L/M/MT (non-ECC)			128MB KTT500/128	£195	£229.13
32MB KTD-OPGXIN/32	£50	£58.75	Tecra 8000, Portege 7000, Satellite 4000, 4005		
Optiplex GXI L/M/MT SDRAM 100MHz			32MB KTT8000/32	£49	£57.58
32MB KTD-OPGX1/32	£56	£65.80	64MB KTT8000/64	£93	£109.28
64MB KTD-OPGX1/64	£108	£126.90			
128MB KTD-OPGX1/128	£209	£245.58			

Part No	ex VAT	inc VAT
<b>72 Pin SIMMs</b>		
60ns : available in Tin (T) or Gold (G)		
<b>Non-Parity (32-bit)</b>		
4MB KTM1x32L-60T	£11	£12.93
8MB KTM2x32L-60T	£18	£21.15
16MB KTM4x32L-60T	£23	£27.03
32MB KTM8x32L-60T	£40	£47.00
64MB KTM16x32L-60T	£139	£163.33
<b>Parity (36-bit)</b>		
4MB KTM1x36L-60T	£14	£16.45
8MB KTM2x36L-60T	£24	£28.20
16MB KTM4x36L-60T	£28	£32.90
32MB KTM8x36L-60T	£53	£62.28
64MB KTM16x36L-60T	£155	£182.13
<b>EDO Non-Parity (32-bit)</b>		
4MB KTM1x32L-60ET	£11	£12.93
8MB KTM2x32L-60ET	£18	£21.15
16MB KTM4x32L-60ET	£23	£27.03
32MB KTM8x32L-60ET	£40	£47.00
<b>EDO Parity (36-bit)</b>		
4MB KTM1x36L-60ET	£14	£16.45
8MB KTM2x36L-60ET	£24	£28.20
16MB KTM4x36L-60ET	£28	£32.90
32MB KTM8x36L-60ET	£53	£62.28
<b>168 Pin DIMMs</b>		
<b>SDRAM Non-Parity</b>		
64MB KTM66x64/64	£112	£131.60
64MB KTM100x64C2/64	£100	£117.50
128MB KTM66x64/128	£214	£251.45
<b>SDRAM Parity</b>		
16MB KTM66x72/16	£31	£36.43
64MB KTM66x72/64	£123	£144.53
64MB KTM100x72C2/64	£137	£160.98
128MB KTM66x72/128	£239	£280.83
<b>Digital Camera &amp; Adaptor</b>		
4MB CF/AADP	£43	£50.53
8MB CF/BADP	£52	£61.10
16MB CF/16ADP	£73	£85.78
24MB CF/24ADP	£93	£109.28
32MB CF/32ADP	£112	£131.60



Upgrading memory is the single most cost effective way of increasing system performance.

#### But Not All Memory Is Created Equal.

Knowing what questions to ask about memory will save you time and money.

#### >>> Warranties - what do they mean?

Insist on a lifetime warranty from an established manufacturer.

#### >>> What about support?

Make sure your memory comes from a manufacturer that offers free, expert technical support.

#### >>> What are the testing procedures?

Choose memory from a manufacturer who tests every single module 100% of the time.

#### >>> Is compatibility absolute?

Modules must be specifically designed for the exact systems they will be used in.

#### >>> Where do the components come from?

Only accept chips purchased directly from manufacturers such as IBM, Samsung and Toshiba.

Kingston Technology is the world's leading supplier of computer memory.

All Kingston memory is guaranteed for 100% compatibility and reliability and carries lifetime warranty.

**SALES FREEPHONES : South - 0800 597 5 333**

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THE BEST YOU'LL GET

**SDRAM DIMMs - 168 PIN**

ex VAT inc VAT



168pin DIMMs sold by SMC use synchronous SDRAM, operating at 3.3volts and running at 66MHz.

They are non-parity, un-buffered and also feature an SPD chip allowing them to be compatible with all machines requiring standard SDRAM.

Compatible motherboards & chipsets include:- Intel VX/TX/LX/BX.

**66MHz**

19-95-0821	8MB (1 x 64)	£29	£34.08
19-95-1622	16MB (2 x 64)	£18	£21.15
19-95-3224	32MB (4 x 64)	£29	£34.08
19-95-6468	64MB (8 x 64)	£59	£69.33
19-95-1280	128MB (16 x 64)	£115	£135.13
19-95-2560	256MB (32 x 64)	£479	£562.83

**100MHz - PC100**

100MHz SDRAM modules require an Intel BX chipset.

19-95-3201	32MB (4 x 64)	£32	£37.60
19-95-6401	64MB (8 x 64)	£59	£69.33
19-95-1281	128MB (16 x 64)	£115	£135.13

**SIMMs - 72 PIN**

ex VAT inc VAT



**EDO**

Non-Parity EDO Memory offers faster performance, but requires motherboard support; please check your motherboard manual to confirm that it supports EDO memory and any size limitations.

486-based computers that support EDO can take single modules, but Pentium computers require EDO to be installed in pairs.

**EDO SIMMs are non-parity (32-bit) and run at 60ns.**

13-97-0400	4Mb (1 x 32)	£6	£7.05
13-97-0801	8Mb (2 x 32)	£9	£10.58
13-97-1601	16Mb (4 x 32)	£21	£24.68
13-97-3201	32Mb (8 x 32)	£44	£51.70
13-97-6401	64Mb (16 x 32)	£85	£99.88
13-97-1281	128Mb (32 x 32)	£169	£198.58

**Fast Page Mode (FPM)**

FPM SIMMs can be installed singly in 486-based PCs that support them, but Pentium-based PCs require SIMMs to be installed in pairs. With 70ns modules in increasingly short supply, we strongly advise the purchase of 60ns.

Always check your manual for compatibility and motherboard support.

**Non-Parity (32-bit)**

13-97-0406	4Mb (1 x 32) 60ns	£6	£7.05
13-97-0407	4Mb (1 x 32) 70ns	£8	£9.40
13-97-0806	8Mb (2 x 32) 60ns	£10	£11.75
13-97-0807	8Mb (2 x 32) 70ns	£11	£12.93
13-97-1606	16Mb (4 x 32) 60ns	£24	£28.20
13-97-1607	16Mb (4 x 32) 70ns	£29	£34.08
13-97-3206	32Mb (8 x 32) 60ns	£36	£42.30
13-97-3207	32Mb (8 x 32) 70ns	£52	£61.10

**Full Parity (36-bit)**

13-97-0117	1Mb (256k x 36) 70ns	£24	£28.20
13-97-0217	2Mb (512k x 36) 70ns	£15	£17.63
13-97-0416	4Mb (1 x 36) 60ns	£9	£10.58
13-97-0417	4Mb (1 x 36) 70ns	£9	£10.58
13-97-0816	8Mb (2 x 36) 60ns	£18	£21.15
13-97-0817	8Mb (2 x 36) 70ns	£18	£21.15
13-97-1616	16Mb (4 x 36) 60ns	£33	£38.78
13-97-1617	16Mb (4 x 36) 70ns	£34	£39.95
13-97-3216	32Mb (8 x 36) 60ns	£59	£69.33
13-97-3217	32Mb (8 x 36) 70ns	£65	£76.38

**SIMMs - 30 PIN**

ex VAT inc VAT



All 30pin SIMMs from SMC have full parity checking.

**3-chip**

10-97-1963	1Mb (1 x 9) 60ns	£4	£4.70
10-97-1973	1Mb (1 x 9) 70ns	£4	£4.70
10-97-1983	1Mb (1 x 9) 80ns	£3	£3.53
10-97-4963	4Mb (4 x 9) 60ns	£8	£9.40

**9-chip**

10-97-1969	1Mb (1 x 9) 60ns	£6	£7.05
10-97-1979	1Mb (1 x 9) 70ns	£9	£10.58
10-97-1989	1Mb (1 x 9) 80ns	£4	£4.70
10-97-4969	4Mb (4 x 9) 60ns	£11	£12.93
10-97-7976	16Mb (16 x 9) 60ns	£35	£41.13

30pin SIMMs must be installed as follows :-  
286 & 386sx-based PCs - in matching pairs.

386DX & 486-based PCs - in matching sets of four.

Please check your motherboard manual to confirm that your PC supports the required module size, speed and configuration.

**SO DIMMs - 72 PIN**

ex VAT inc VAT



**3.3 volt**

19-93-0413	4Mb (1 x 4) 70ns	£25	£29.38
19-93-0433	4Mb (1 x 16) 70ns	£42	£49.35
19-93-0833	8Mb (1 x 16) 70ns	£45	£52.88
19-93-0823	8Mb (2 x 8) 70ns	£45	£52.88
19-93-1613	16Mb (4 x 4) 70ns	£45	£52.88

**5 volt**

19-93-0415	4Mb (1 x 4) 70ns	£44	£51.70
19-93-0435	4Mb (1 x 16) 70ns	£39	£45.83
19-93-0835	8Mb (1 x 16) 70ns	£12	£14.10
19-93-0825	8Mb (2 x 8) 70ns	£45	£52.88
19-93-1615	16Mb (4 x 4) 70ns	£38	£44.65

Chip size, voltage, buffering, clock speeds and fitting all differ. Unless you know exactly which SO DIMM you require, we recommend the use of matched modules, especially for branded machines. Please call for details.

Always check machine compatibility before ordering.



**UPGRADE WITH THE UK'S PREMIER MEMORY SUPPLIER**

**FREE !**

**ANTI-STATIC WRIST STRAP**

with all orders over £35 : Please ask when ordering



**Why SMC ?** While memory specifications can look the same on the page, it's a hard fact of life that the quality of manufacture and supply is more variable than most people think possible. So, it's reassuring to know that at SMC we haven't forgotten the importance of quality control. We insist on buying from reliable and reputable sources, and we carry out frequent batch checks in order to maintain the quality of our goods, and safeguard our hard-won reputation for reliability. Our range of SIMMS, DIMMS and Matched Memory is exhaustive, and because we stock in depth we can guarantee swift delivery times and very competitive prices. Add to this SMC's highest levels of after-sales service, and you'll know that when you buy from us, you're getting quality, value ... and peace of mind.

**5 Year Warranty - Batch Tested**

**Product Focus : SMC's guide to memory types**

**What are EDO SIMMs ?**

An EDO SIMM (Enhanced Data Out) is the next logical step in the 72 pin SIMM family, offering twice the communication with your computer's processor. It gives faster results in your spreadsheets or quicker updates when playing one of today's demanding 3D games. Also provides :

- > Faster boot-up times
- > Greater multi-tasking
- > Greater reliability
- > Better overall performance
- > Compatibility with more motherboards

Note : EDO SIMMs must be fitted in pairs

**What are PC100 DIMMs ?**

With today's state-of-the-art systems things move at such breakneck speeds that reliability and speed requirements have become an issue and have led to the development of PC100 DIMMS. Designed to cope with the pressing demands of today's and tomorrow's software and systems, it provides these major advantages :

- > Works with 100MHz motherboards including BX chipsets and Super Socket 7
- > Available with or without ECC (Error Correction Code)
- > Works with CPUs 350MHz+ (slot 1)
- > Provides fast access for AGP texture manipulation
- > Can be fitted singly
- > Can be used in any combination e.g. 16+32+64 = 112MB





No. FS40989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

Your Processor and Motherboard form the heart of your system. If you don't make the right choice here, the performance of your system may be seriously held back or even subject to incompatibility problems. That may sound daunting, but we give you as much technical data as possible on these pages - note in particular our new-style motherboard listing - so that when you call you'll have the information you need to make an informed choice. Don't forget, at SMC we sell only major branded products so you can be sure of superior quality, performance and after-sales support. If you have a special requirement, we can discuss your needs and ensure that the products you buy will maximise the value you get for your money.

# PROCESSORS, CASES & OVERDRIVES

## PROCESSORS



ex VAT inc VAT

### Intel

#### Pentium II - Slot 1 with 512k cache

Boxed, with HS & Fan (3 Yr Warranty)

09-31-8338	PII 333MHz - 66MHz bus (ECC)	£169	£198.58
09-31-8350	PII 350MHz - 100MHz bus (ECC)	£143	£168.03
09-31-8400	PII 400MHz - 100MHz bus (ECC)	£245	£287.88
09-31-8450	PII 450MHz - 100MHz bus (ECC)	£379	£445.33

#### Celeron - Slot 1 with 128k cache

Boxed, with HS & Fan (3 Yr Warranty)

09-31-8365	PII 366MHz - 66MHz bus (128k)	£99	£116.33
09-31-8400	PII 400MHz - 66MHz bus (128k)	£245	£287.88

#### Celeron - Slot 370 with 128k cache

Boxed, with HS & Fan (3 Yr Warranty)

09-31-7300	300MHz - 66MHz bus	£46	£54.05
09-31-7333	333MHz - 66MHz bus	£61	£71.68
09-31-7366	366MHz - 66MHz bus	£89	£104.58
09-31-7400	400MHz - 66MHz bus	£112	£131.60

## INTEL OVERDRIVE



The Pentium II Overdrive processor is designed to upgrade a Pentium Pro system to Pentium II technology and performance. It gives both higher performance for existing applications and the ability to run Pentium II technology software. It includes voltage filtering and added silicon and package features to ensure worry-free processor upgradability and is supplied with a full three year warranty.

### Pentium II Overdrive

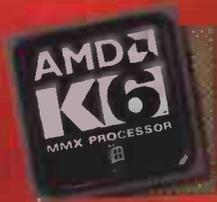
ex VAT inc VAT

09-31-6333	300/333MHz Pentium II OverDrive for Pentium pro (Socket 8 ZIF)	£349	£410.08
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All INTEL Overdrive Processors come complete with built-on fan.



## INCREASE YOUR PERFORMANCE WITH THE UK'S PREMIER UPGRADE SUPPLIER



### AMD

#### K6-2 with 3DNow - Super Socket 7

09-05-2300	300MHz, 3.3v, 100MHz bus	£52	£61.10
09-05-2333	333MHz, 3.3v, 95MHz bus	£59	£69.33
09-05-2350	350MHz, 3.3v, 100MHz bus	£68	£79.90
09-05-2380	380MHz, 3.3v, 95MHz bus	£92	£108.10
09-05-2400	400MHz, 3.3v, 100MHz bus	£112	£131.60

NOTE : AMD processors require specific motherboard support (see table) and Heat Sink and Fan units are highly recommended.



### Cyril

#### 6x86MX - Socket 7

09-17-6300	300MHz, 2.9v, 66MHz bus	£41	£48.18
------------	-------------------------	-----	--------

NOTE : Cyril processors require specific motherboard support (see table) and Heat Sink and Fan units are highly recommended.

### Heat Sink / Fan Units

NOTE : these units are only available when purchasing a CPU. We recommend their use for all CPUs. Ball Bearing units are designed to run at very high temperatures.

09-95-6000	Pentium Pro 200	£17	£19.98
<b>Ball Bearing Units</b>			
09-95-6086	Cyrix 6x86MX	£10	£11.75
09-95-5400	Intel Pentium/AMD K6	£14	£16.45
09-95-9000	Intel Celeron	£10	£11.75

## PC CASES (CE Approved)



### Standard PC cases

Above picture refers to the ATX cases below. Left > FT, MINI, DT.

ex VAT inc VAT

#### PC-ATX : 235w PSU

70-00-4006	Desktop, 2x 3.5", 2x 5.25" bays	£55	£64.63
70-00-4005	Mini Tower, 4x 3.5", 2x 5.25" bays	£69	£81.08
70-00-4003	Full Tower, 5x 3.5", 6x 5.25" bays	£72	£84.60



### High-specification PC cases

Above picture refers to the AT and ATX cases below.

Left > DT AT/ATX, MT ATX, FT AT/ATX, MIDI ATX, MINI/MIDI AT.

ex VAT inc VAT

#### PC-AT : 230w PSU

70-97-3012	Standard Desktop 3x 3.5", 2x 5.25" bays	£59	£69.33
70-97-3712	Mini/Midi Tower 4x 3.5", 3x 5.25" bays	£59	£69.33
70-97-3912	Full Tower, 4x 3.5", 6x 5.25" bays	£85	£99.88

#### PC-ATX : 200w PSU

70-97-3330	Desktop, 3x 3.5", 2x 5.25" bays	£72	£84.60
70-97-3790	Mini Tower, 4x 3.5", 2x 5.25" bays	£69	£81.08
70-97-3730	Midi Tower, 4x 3.5", 3x 5.25" bays	£89	£104.58
70-97-3930	Full Tower, 4x 3.5", 6x 5.25" bays	£97	£113.98

All cases are supplied with power supply units, power cables, screws and motherboard mounts.

## PRODUCT LINK



### Drive boxes page 14

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**MOTHERBOARDS**

intel	G	ASUS	ASUS																
SMC Ref	Make	Model	Bus MHz	Chipset	Max. Intel	Max. AMD	Max. AMD K6-2	Max. Cyrix	Cache	SIMM slots	DIMM slots	AGP slot	PCI slots	ISA slots	PCI/ISA slots	Other	ex VAT	inc VAT	
<b>Pentium - Socket 7 / Super Socket 7</b>																			
<b>AT</b>																			
07-99-0520	ASUS	P5A-B	100	ALI V	233	300	350	333	512k	0	3	Y	2	1	1	UH	£58	£68.15	
07-99-0525	ASUS	P5A-B/AUDIO	100	ALI V	233	300	350	333	512k	0	3	Y	2	1	1	UH, S	£61	£71.68	
07-97-5320	TMC	A15VG+	100	MVP3	233	350	450	333	512k	2	3	Y	3	1	1	UH	£52	£61.10	
<b>ATX</b>																			
07-99-0530	ASUS	P5A	100	ALI V	233	300	350	333	512k	0	3	Y	4	1	1	UP	£61	£71.68	
07-99-0535	ASUS	P5A-B/AUDIO	100	ALI V	233	300	350	333	512k	0	3	Y	4	1	1	UP, S	£68	£79.90	
07-97-5315	TMC	T15VG	66	VP3	233	233	-	266	512k	4	3	Y	3	2	1	UP	£44	£51.70	
07-97-5901	TMC	T15TT	66	TX	233	300	-	266	512k	4	2	-	3	3	1	UH	£49	£57.58	
07-97-5325	TMC	T15VG+	100	MVP3	233	350	450	333	1MB	2	3	Y	4	1	1	UP	£59	£69.33	
<b>Celeron - Socket 370</b>																			
<b>ATX</b>																			
07-99-0370	ASUS	MEL-M		(Other spec. to follow)													£79	£92.83	
07-97-0370	TMC	T17NBA	66	BX	433	-	-	-	-	-	3	Y	3	1	1	S	£85	£99.88	
<b>Pentium II - Slot 1</b>																			
<b>AT</b>																			
07-93-7011	Gigabyte	GA-6BA	100	BX	450	-	-	-	-	-	4	Y	3	1	1	UP	£104	£122.20	
<b>ATX</b>																			
07-99-0700	ASUS	P2L97	66	LX	333	-	-	-	-	-	3	Y	4	1	1	UP	£69	£81.08	
07-99-0730	ASUS	P2B	100	BX	450	-	-	-	-	-	3	Y	3	2	1	UP	£95	£111.63	
07-99-0732	ASUS	P2B-S	100	BX	450	-	-	-	-	-	4	Y	3	1	1	UP, SC	£229	£269.08	
07-99-0735	ASUS	P2B/LS	100	BX	450	-	-	-	-	-	4	Y	3	1	1	UP, SC, L	£249	£292.58	
07-99-0739	ASUS	P2B/DS	100	BX	450	-	-	-	-	-	4	Y	3	1	1	UP, DP, SC	£322	£378.35	
07-93-7002	Gigabyte	GA-686BXE	100	BX	450	-	-	-	-	-	4	Y	4	1	1	UP	£79	£92.83	
07-93-7021	Gigabyte	GA-686BXDS	100	BX	450	-	-	-	-	-	4	Y	3	2	1	UP, DP, SC	£179	£210.33	
07-31-2098	Intel	SE440BX	100	BX	450	-	-	-	-	-	3	Y	3	1	1	UP	£79	£92.83	
07-31-2099	Intel	SE440BX/A	100	BX	450	-	-	-	-	-	3	Y	3	1	1	UP, S	£95	£111.63	
07-97-2450	TMC	T16NB	100	BX	450	-	-	-	-	-	4	Y	4	1	1	UP	£72	£84.60	
07-97-2470	TMC	TD6NB	100	BX	450	-	-	-	-	-	4	Y	4	1	1	UP, DP	£255	£299.63	
07-97-2460	TMC	T16NBS+	100	BX	450	-	-	-	-	-	3	Y	3	2	1	UP, 64Mb	£125	£146.88	

Key to other features :

UH : USB Header    UP : USB Port    SC : Onboard SCSI    S : Onboard Sound    G : Onboard Graphics    DP : Dual Processor    L : Onboard LAN

NOTES : 1 100MHz bus motherboards require PC100 memory modules when processor bus speed exceeds 66MHz  
2 \*PCI/ISA slots\* means that in addition to the PCI & ISA slots listed there is also another slot that can be either PCI or ISA.  
3 TX, LX and BX are Intel chipsets. ALI V is by Aladdin. VP3 and MVP3 are VIA chipsets.



Intel  
**'Seattle'**  
**SE440BX**

07-31-2098

**£79**

£92.83 Inc.VAT



Offers the latest advances in processor & chipset performance by combining support for a high-frequency Pentium II processor with the superior bandwidth of both the Dual Independent Bus (DIB) and the 100MHz system bus. By integrating the innovative Accelerated Graphics Port and the increased 100-MHz system bus throughput, the SE440BX motherboard delivers the highest performance available for demanding system applications.

The perfect compliment to a boxed Intel Pentium II processor.



**TMC T15VG+**

07-97-5325

**£59**

£69.33 Inc.VAT



This extremely flexible Super Socket 7 ATX motherboard, using the VIA MVP3 chipset, will support a wide range of bus speeds including 66, 95 & 100MHz.

It supports AMD K6/2 processors and AGP graphics cards so is ideal for all those who do not wish to make the upgrade to Pentium II yet. To achieve even faster speeds the T15VG+ has twice as much cache memory as other motherboards.

Enjoyable performance, wonderful price, rigid quality.

When you buy a motherboard from SMC, you get full technical support.

You also get SMC's **FREE** 16-page, easy-to-follow Installation Guide.

Subjects covered include:-  
Mounting the board, installing Processors and Memory, making Power and Case connections. Basic and Advanced connections, configuring your BIOS and a section on Troubleshooting.



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**OPTICAL DRIVES**

ex VAT Inc VAT

**Fujitsu**

50-24-0643 MCB30645S 640MB Internal £229 £269.08

**Olympus**

50-91-0230 Power MO 230 II Universal 230Mb External P/Port &amp; SCSI £179 £210.33

50-91-2600 Power MO 2600 2.6Gb External £999 £1173.83

All above units are SCSI devices requiring a SCSI Controller.

**PANASONIC PD DRIVES**

ex VAT Inc VAT

**LF1196AB**

51-57-0811 Internal EIDE drive, 8-Speed CD + 650Mb Optical £189 £222.08

**LF1500EPB**

51-57-0815 Parallel Port drive, 8-speed CD + 650Mb Optical £239 £280.83

**FLOPPY DRIVES**

ex VAT Inc VAT

**Internal**

39-97-0350 3.5" 1.44MB, 1" high drive £15 £17.63

**Parallel Port****Micro Solutions BackPack**

Require a working floppy drive for installation of software drivers.

39-42-0350 3.5" 1.44MB parallel port drive (Supports 720k DD format) £72 £84.60

39-42-0525 5.25" 1.2MB parallel port drive (Does not support 360k DD format) £109 £128.08

**FLIP DISK**

ex VAT Inc VAT

All drives work via PCMCIA and are quoted as actual

**native sizes**

37-92-9021	2.1GB	£250	£293.75
37-92-9032	3.2GB	£327	£384.23
37-92-9040	4.0GB	£315	£370.13
37-92-9066	6.4GB	£384	£451.20
37-92-9100	10.0GB	£528	£620.40

**Accessories**

01-92-0221	2 to 1 compression software	£22	£25.85
75-92-0122	Parallel Port/Keyboard cable set	£33	£38.78

**Baby ZIP**

37-92-0100 PCMCIA 100Mb ZIP External £169 £198.58

**BABY ZIP****Portable Zip Drive****Key Features**

- Powered directly from your computer
- Uses Standard Immedia 100Mb ZIP disks
- PCMCIA Type II connection
- No specific drivers required
- Windows 95/98 Plug & Play
- 16bit data transfer - up to 3.3Mb/s
- Automatic media verification during format

**FLIP DISK****Portable Hard Drive****Key Features**

- No power cables required
- Instantly increase your hard drive capacity
- PCMCIA interface, Plug & Play
- Up to 12.8Gb\* using \*Novadisk compression software
- Transfer data between your Laptop and Desktop
- Store and run programs and files
- Optional parallel port cables



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**Centronics**

73-97-3113 1 x 3.5"HH, 40 watt £65 £76.38

73-97-3213 2 x 3.5"HH, 65 watt £99 £116.33

73-97-3413 4 x 3.5"HH, 2 x 65 watt £179 £210.33

73-97-3114 1 x 3.5"HH, 30 watt £69 £81.08

73-97-6114 1 x 5.25"FH, 65 watt £94 £110.45

73-95-9412 2 x 5.25"HH, Conversion Kit for 73-97-6114 £12 £14.10

73-97-5114 1 x 5.25"HH, 30 watt £65 £76.38

73-97-6215 2 x 5.25"FH, 2 x 65 watt £159 £186.83

73-95-9524 4 x 5.25"HH, Conversion Kit for 73-97-6215 £18 £21.15

73-97-6315 3 x 5.25"FH, 3 x 65 watt £239 £280.83

73-95-9536 6 x 5.25"HH, Conversion Kit for 73-97-6315 £25 £29.38

73-97-6415 4 x 5.25"FH, 4 x 65 watt £293 £344.28

**Micro-D**

73-97-3133 1 x 3.5"HH, 40 watt £79 £92.83

73-97-3233 2 x 3.5"HH, 65 watt £115 £135.13

73-97-3433 4 x 3.5"HH, 2 x 65 watt £189 £222.08

73-97-5134 1 x 5.25"HH, 30 watt £85 £99.88

73-97-6144 2 x 5.25"HH, 65 watt £115 £135.13

73-97-6235 2 x 5.25"FH, 65 watt £179 £210.33

**Fast-Wide**

73-97-3152 1 x 3.5"HH, 40 watt £89 £104.58

73-97-3252 2 x 3.5"HH, 65 watt £119 £139.83

73-97-3452 4 x 3.5"HH, 65 watt £199 £233.83

KEY : HH=Half-Height (1 bay high) FH=Full-Height (2 bays high)

Wide SCSI options are available on selected models : please call for details.

All boxes are TUV approved and come with a 3 year warranty.

**HARD DRIVE MOUNTING KITS**

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**Fitting Bracket kit**

This universal kit can be used to mount any 3.5" Hard Drive we sell into a 5.25" bay in virtually any standard PC case.

(Note : not suitable for cases using special bays or slide rails.)

79-95-1135 DBHD - for 3.5" IDE or SCSI drive £9 £10.58

79-95-1123 DBHD2.5 - for 2.5" drive (3.5" bay) £14 £16.45

**Removable Caddies**

Removable Drive Caddies enable easy movement of data between sites.

They are ideal for use where large volumes of data may need to be physically transferred, and also where the removal of data for security purposes is required.



The Removable Caddy consists of a 5.25" lockable docking bay which receives a sliding frame containing a 3.5" Hard Drive.

All are complete kits with full installation instructions.

79-97-3102 IDE / EIDE / Ultra-IDE (40-pin) H/duty plastic frame £25 £29.38

79-97-3502 SCSI (50-pin) - H/duty plastic frame £29 £34.08

79-97-3504 SCSI (50-pin) - Metal frame £45 £52.88

79-97-3506 Fast/Wide SCSI (68-pin) Metal frame £79 £92.83

79-97-4001 SCA SCSI (68-pin ext, 80-pin int) for 1x 3.5" HH HDD £89 £104.58

79-97-4003 SCA SCSI (68-pin ext, 80-pin int) for up to 3x 3.5" HDD's, all LP £149 £175.08

**PARALLEL PORT DRIVE BOXES**

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73-97-1183 For IDE / EIDE / Ultra-IDE drives £65 £76.38

73-97-1430 For 5.25" devices £72 £84.60

An ideal solution for turning a standard Hard Drive into a portable device. It is easy to install and includes software to work with any size drive, which will then work at the speed of your parallel port.

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**The Zip® drive: The capacity to do more™**

If you're looking for a new personal data storage system, it's probably because you need the ability to do more. You need look no further. The immense capacity of the 100MB Zip® drive lets you do more. Much more! Not just store more, but create, transport and share more as well. In fact, everything you need to do with a computer. And the Zip drive has the speed and capacity that today's and tomorrow's intensive multimedia applications require. Now Isn't that just why you're looking for a personal storage system?

**250MB - Zip Red**

Two and one-half times larger capacity than the original Zip 100MB drive, Zip 250 drive uses new Zip 250MB disks. The Zip 250 drives also read and write to 100MB disks.



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	ex VAT	inc VAT
<b>Zip Red (250MB)</b>		
35-35-0255 SCSI - External	£129	£151.58
35-35-0250 Parallel port	£139	£163.33
<b>Zip 100MB</b>		
35-35-0105 SCSI - External	£79	£92.83
30-35-0100 ATAPI - Internal	£69	£81.08
38-35-0100 USB - External	£88	£103.40
37-35-0100 Parallel port	£79	£92.83
37-35-0161 Parallel port+6 media	£109	£128.08

**100MB Notebook (CNF) Drives - Intl**

Please check compatibility : for latest models only

35-35-9110 Toshiba	£219	£257.33
35-35-9120 IBM	£219	£257.33
35-35-9130 Compaq	£219	£257.33

**100MB Media (Cartridges)**

95-35-0101 Single	£8	£9.40
95-35-0106 6 Pack multicoloured	£39	£45.83
95-35-0120 20 Bulk Pack multi-c	£125	£146.88

**Accessories**

70-35-0003 Carry Case	£19	£22.33
26-35-0284 PCMCIA to SCSI card	£59	£69.33
26-35-0100 ISA SCSI Controller	£25	£29.38



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The Jaz® drive is the high performance personal storage solution for really big files and applications. There's room enough to store huge graphics, hefty databases, audio and video files, or even to back up your entire hard drive.

**IOMEGA JAZ**

	ex VAT	inc VAT
<b>SCSI Drives</b>		
35-35-2000 2.0Gb - Internal	£249	£292.58
35-35-2005 2.0Gb - External	£249	£292.58

**Media (Cartridges)**

95-35-1001 1.0Gb - Single	£55	£64.63
95-35-2001 2.0Gb - Single	£65	£76.38

**Accessories**

70-35-0003 Carry Case	£19	£22.33
26-35-0450 PCMCIA to SCSI card	£77	£90.48
26-35-0347 ISA 16-bit SCSI card	£59	£69.33
26-35-0346 PCI Bus-mastering SCSI card	£65	£76.38
75-35-0231 Parallel/SCSI convertor	£29	£34.08



**The Ditto Max Professional™ drive: It's Like Insurance for the Important Stuff on your PC™**

Four times faster than other tape drives, the Ditto Max Professional™ drive is the best way to back up and recover your system. Usable with 3GB, 5GB, 7GB and 10GB cartridges, it's a flexible, professional way to protect your stuff.



**IOMEGA DITTO**

	ex VAT	inc VAT
<b>Ditto 2000</b>		
2GB, 19MB/min		
Tape type (see Page 23) - E1		
46-35-2000 Internal Drive	£59	£69.33

**Ditto Max Pro**

3-10GB, 36MB/min		
Tape type (see Page 23) - E2, E3, E4 OR E5		
46-35-3010 Internal Drive	£139	£163.33
46-35-3015 Parallel Port Drive	£169	£198.58

**ISA Controller**

26-35-0030 DITTO-DASH	£19	£22.33
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**The Buz Multimedia Producer™: the Coolest Way to Edit Multimedia on your PC™**

iomega's Buz Multimedia Producer™ is the complete hardware/software package that lets you add digital pictures, sounds and great special effects to your home videos. The mouse-sized Buz Box is a single connection for VCRs camcorders, CDs or DVD players. The UltraSCSI Controller allows you to connect with your source devices such as your CD-ROM, Jaz® drive, Zip® drive or even your scanner.

**IOMEGA BUZ**

	ex VAT	inc VAT
62-35-0700 Multimedia Card SCSI	£149	£175.08



ALL MAJOR CREDIT CARDS ACCEPTED



No. F540989



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## What size Hard Drive do I need ?

With very small differences between the cost of different size Hard Drives, it is obviously tempting to go for the biggest drive within your immediate budget. However, there are several factors you should consider when making your decision. Your needs will increase if you use space-hungry software and/or operating system. (Don't forget Windows 98 has a maximum disk requirement of 300MB!) On the other hand, if you run applications direct from CD, this will obviously lower your needs, as will whether you use removable media (eg Iomega ZIP or JAZ) where you can have an external "plug-in" library of data and/or applications. If you need advice, just give us a call and we'll help you choose the option that's best suited to your requirements.

# HARD DRIVES : SCSI

## ULTRA-SCSI HARD DRIVES

Part No	Size	Make	Model	Cache	ex VAT	inc VAT
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### Ultra-SCSI

Ultra-SCSI drives transfer data at 20Mb/sec and use a 50-pin connector

35-86-4363	4.3GB	Western Dig	E4360-0003	Enterprise512k	8ms	£225	£264.38	
35-70-4520	4.5GB	Seagate	ST34520N	512k	9.5ms	£145	£170.38	
35-70-4573	4.5GB	Seagate	ST34573N	512k	7.1ms	£249	£292.58	
35-30-4529	4.5GB	IBM	00K3980	Ultrastar	512k	7.5ms	£152	£178.60
35-30-9188	9.1GB	IBM A/V	59H6588	Ultrastar	512k	7.5ms	£282	£331.35
35-70-9173	9.1GB	Seagate	ST39173N	Barracuda	512k	7.5ms	£285	£334.88
35-86-9103	9.1GB	Western Dig	E9100-003		512k	7.9ms	£289	£339.58
35-64-9101	9.1GB	Quantum	TD309100S	Atlas III	1MB	7.5ms	£295	£346.63
35-30-1800	18GB	IBM	59H6589	Ultrastar	512k	7.5ms	£529	£621.58
35-70-8273	18.2GB	Seagate	ST118273N		512k	7.1ms	£519	£609.83
35-64-1820	18.2GB	Quantum	TD318200S	Atlas III	1MB	7.5ms	£505	£593.38

### Ultra-wide SCSI

35-86-2177	2.1GB	Western D	E2170-0007	Enterprise512k	8ms	£139	£163.33	
35-24-4303	4.3GB	Fujitsu	MAB3045SP	512k	7.5ms	£209	£245.58	
35-30-4318	4.3GB	IBM	22L0278	512k	8.5ms	£143	£168.03	
35-86-4367	4.3GB	Western D	E4360-0007	Enterprise512k	8ms	£233	£273.78	
35-30-4547	4.5GB	IBM	00K4000	Ultrastar	512k	7.5ms	£142	£166.85
35-64-4550	4.5GB	Quantum	PX4550SW	Viking II	512k	7.5ms	£163	£191.53
35-70-4574	4.5GB	Seagate	ST34573W		512k	7.1ms	£249	£292.58
35-24-3046	4.5GB	Fujitsu	MAC3045SP		512k	7.5ms	£229	£269.08
35-70-6531	6.5GB	Seagate	ST36530V		512k	9.5ms	£199	£233.83
35-24-9105	9.1GB	Fujitsu	MAB3091SP		496k	7.5ms	£319	£374.83
35-24-3092	9.1GB	Fujitsu	MAC3091SP		512k	7.5ms	£369	£433.58
35-30-0211	9.1GB	IBM	22L0211	UltrastarES	512k	7.5ms	£275	£323.13
35-30-9190	9.1GB	IBM A/V	59H6590	Ultrastar	512k	7.5ms	£289	£339.58
35-70-9141	9.1GB	Seagate	ST39140W		512k	9.5ms	£242	£284.35
35-70-9174	9.1GB	Seagate	ST39173W	Barracuda	512k	7.5ms	£285	£334.88
35-86-9107	9.1GB	Western Dig	E9100-007		512k	7.9ms	£309	£363.08
35-86-9108	9.1GB	Western Dig	E9100-0016 (A/V)		512k	8ms	£309	£363.08
35-30-1891	18GB	IBM	59H6591	Ultrastar	512k	7.5ms	£525	£616.88
35-24-1800	18GB	Fujitsu	MAA3182SP		512k	8ms	£549	£645.08
35-70-8274	18.2GB	Seagate	ST118273W		512k	7.1ms	£519	£609.83

### Ultra-2 SCSI

Ultra-2 SCSI drives transfer data at 80Mb/sec and use a 68-pin connector

35-86-4557	4.5GB	Western Dig	E4550-0024		512k	7.8ms	£255	£299.63
35-86-4558	4.5GB	Western Dig	E4550-AV0030 (A/V)		512k	7.8ms	£269	£316.08
35-70-4575	4.5GB	Seagate	ST34573LV		512k	7.1ms	£249	£292.58
35-70-4502	4.5GB	Seagate	ST34502LV		1MB	5.4ms	£325	£381.88
35-86-9117	9.1GB	Western Dig	E9100-0024		512k	7.8ms	£322	£378.35
35-86-9118	9.1GB	Western Dig	E9100-AV0030 (A/V)		512k	7.8ms	£315	£370.13
35-70-9102	9.1GB	Seagate	ST39102LV		1MB	5.4ms	£415	£487.63
35-64-9108	9.1GB	Quantum	TD309100LW	Atlas III	1MB	7.5ms	£299	£351.33
35-70-8275	18.2GB	Seagate	ST118273LV		512k	7.1ms	£519	£609.83
35-64-1827	18.2GB	Quantum	TD318200LV	Atlas III	1MB	7.5ms	£489	£574.58



## SCA SCSI HARD DRIVES

SCA is an 80-pin connector that carries both data and power so that hard drives can be connected more easily.

It is used mainly in RAID arrays with hot swappable drives but because of its ease of connection, its use in standard systems is becoming more common.

External chassis for SCA drives to convert to 68 pin are also available. See page 14.

Part No	Size	Make	Model	Cache	ex VAT	inc VAT
---------	------	------	-------	-------	--------	---------

### Ultra-wide SCSI

35-86-4368	4.3GB	Western Dig	E4360-0008	512k	8ms	£235	£276.13
35-30-4020	4.5GB	IBM	00K4020	512k	7.5ms	£155	£182.13
35-24-3045	4.5GB	Fujitsu	MAB3045SC	498k	8ms	£209	£245.58
35-70-6531	6.5GB	Seagate	ST36530WC	512k	9.5ms	£199	£233.83
35-86-9106	9.1GB	Western Dig	E9100-0008	512k	8ms	£309	£363.08
35-86-9105	9.1GB	Western Dig	E9100-0017 (A/V)	512k	8ms	£309	£363.08
35-24-3091	9.1GB	Fujitsu	MAB3091SC	498k	8ms	£329	£386.58
35-30-4010	9.1GB	IBM	00K4010	512k	7.5ms	£279	£327.83
35-30-6594	9.1GB	IBM	59H6594	1MB	6.5ms	£285	£334.88
35-30-7625	9.1GB	IBM	05J7625	1MB	7.5ms	£359	£421.83
35-30-6595	18.2GB	IBM	59H6595	1MB	7.5ms	£589	£692.08
35-24-3182	18.2GB	Fujitsu	MAA3182SC	498k	8ms	£599	£703.83

### Ultra-2 SCSI

35-86-4559	4.5GB	Western Dig	E4550-0025	512k	7.8ms	£255	£299.63
35-86-4556	4.5GB	Western Dig	E4550-AV0034 (A/V)	512k	7.8ms	£269	£316.08
35-86-9119	9.1GB	Western Dig	E9100-0025	512k	7.8ms	£333	£391.28
35-86-9116	9.1GB	Western Dig	E9100-AV0034 (A/V)	512k	7.8ms	£349	£410.08

## PRODUCT LINK



### Drive boxes page 14

## ADAPTEC SCSI CONTROLLER CARDS

Part No	Model	Interface	Ext.Con	Devices	Boot	ex VAT	inc VAT
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### Kits (include software and internal cable)

<b>ISA Bus</b>							
26-03-1542	AHA1542CP	FastSCSI2	Micro-D	7&FD	Y	£149	£175.08
<b>PCI Bus</b>							
26-03-2910	AHA2910B	FastSCSI2	Micro-D	7	N	£55	£64.63
26-03-2920	AHA2920	FastSCSI2	Micro-D	7	Y	£69	£81.08
26-03-2941	AHA2940UA	UltraSCSI	Micro-D	7	Y	£139	£163.33
26-03-2947	AHA2940UW	UltraWide	Micro-D wide	15	Y	£165	£193.88
26-03-2980	AHA2940U2W	Ultra-2	Micro-D	15	Y	£219	£257.33
26-03-3943	AHA3940AU	UltraSCSI	Micro-D	14	Y	£245	£287.88
26-03-3949	AHA3940AUW	UltraWide	Micro-D wide	30	Y	£285	£334.88
<b>PCMCIA (PC Card)</b>							
26-03-1460	APA1460A-2	FastSCSI2	Micro-D, Centronics	7		£95	£111.63
26-03-1480	APA1480	UltraSCSI	Micro-D, Centronics	3		£119	£139.83
<b>RAID 0, 1, 0/1, or 5 (PCI Bus-Network &amp; WinNT)</b>							
26-03-0131	AAA-131	UltraWide	Micro-D wide	45	Y	£269	£316.08
26-03-0133	AAA-133	UltraWide	Micro-D wide	45	Y	£435	£511.13
<b>Firewire/1394 (PCI)</b>							
26-03-8920	AHA-8920	1394				£155	£182.13
26-03-8945	AHA-8945	1394 & Ultra-2 SCSI				£339	£398.33

### Bare Cards (do not include software or cable)

Part No	Model	Interface	Ext.Con	Devices	Boot	ex VAT	inc VAT
<b>ISA Bus</b>							
26-03-1520	AHA1520B	FastSCSI2	Micro-D	7	Y	£43	£50.53
26-03-1549	AHA1542	FastSCSI2	Micro-D	7&FD	Y	£115	£135.13
<b>PCI Bus</b>							
26-03-2943	AHA2940UA	UltraSCSI	Micro-D	7	Y	£105	£123.38
26-03-2949	AHA2940UW	UltraWide	Micro-D wide	15	Y	£129	£151.58

**SALES FREEPHONES : South - 0800 597 5 333**

**Midlands - 0800 597 6 333**

**North - 0800 597 7 333**

**Scotland - 0800 597 8 333**

**FAX : 01753 524443**

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When you buy a Hard Drive from SMC, you get something no other company offers - a free 24 page, easy-to-follow Installation Guide containing everything you need to ensure a trouble-free set up.

It covers:

- > Getting Started & basic troubleshooting
- > IDE/EIDE Hard Drive Installation
- > CMOS configuration
- > Installing with & without a translating BIOS
- > SCSI Hard Drive installation & configuration
- > Creating a bootable floppy disk
- > Windows NT & Windows '95

**FREE**  
WHEN YOU BUY FROM SMC



**CHECK OUT CABLES & BOXES ON PAGES 22 & 14**



**IDE/EIDE/UIIDE CONTROLLERS**

		ex VAT	inc VAT
<b>IDE</b>			
24-95-1300	IDESPC, ISA, 2HD/2FD, with I/O Ports	£17	£19.98

		ex VAT	inc VAT
<b>EIDE</b>			
With ATAPI/CD-ROM & LBA support			
24-97-1360	EIDEMAX, ISA, 2HD	£24	£28.20
24-97-1365	EIDEPRO, ISA, 4HD/2FD	£39	£45.83

		ex VAT	inc VAT
<b>FloppyMax</b>			
24-97-0120	FloppyMax, ISA Add-on for LS-120 (120Mb A:Drive)	£25	£29.38

		ex VAT	inc VAT
<b>ULTRA DMA33 (UIIDE)</b>			
24-97-0033	Promise Pro ATA Ultra33, PCI add-on controller supporting Quantum ST and UIIDE drives. Co-exists with existing IDE/EIDE - ATAPI devices	£39	£45.83
24-97-1120	Promise Ultra ATA PCI RAID controller	£85	£99.88
24-97-1361	EIDEMAX 2, ISA, 2HD	£39	£45.83

		ex VAT	inc VAT
<b>I/O Cards</b>			
23-97-0202	2x EPP/ECP Parallel Ports (High-speed)	£25	£29.38
23-97-1313	2x Serial, 1x Parallel Port (High-speed)	£29	£34.08

**EIDE 2.5" HARD DRIVES**

Part No	Size	Make	Model	Cache	ex VAT	inc VAT
<b>2.1Gb - 4.0Gb</b>						
30-75-2111	2.1Gb	Toshiba	MK2110MAT	512k 13ms	£99	£116.33
30-75-3205	3.2Gb	Toshiba	MK3205MAV	128k 13ms	£129	£151.58
30-75-4310	4.3Gb	Toshiba	MK4310MAT	128k 13ms	£149	£175.08

These Hard Drives come with a 2 year warranty. All are 12.7mm high with a 44-pin connector, but please check your system for compatibility. MK2105MAV is also UIIDE.

**PRODUCT LINK**

**Utility Software : see Page 8**

**ULTRA-IDE HARD DRIVES**

Part No	Size	Make	Model	Cache	ex VAT	inc VAT
<b>2.1Gb - 6.8Gb</b>						
30-24-3033	3.2GB	Fujitsu	MPC3032AT	256k 10ms	£78	£91.65
30-70-3210	3.2GB	Seagate	ST33210A	256k 9.5ms	£75	£88.13
30-64-3201	3.2GB	Quantum	EX3200AT	512k 9.5ms	£79	£92.83
30-24-3044	4.3GB	Fujitsu	MPC3043AT	256k 10ms	£85	£99.88
30-70-4321	4.3GB	Seagate	ST34321A	128k 11ms	£81	£95.18
30-39-4322	4.3GB	Maxtor	90432D2	256k 9ms	£84	£98.70
30-86-4302	4.3GB	Western Dig	AC14300AU	256k 9.5ms	£89	£104.58
30-24-3065	6.4GB	Fujitsu	MPC3064AT	256k 10ms	£95	£111.63
30-39-0648	6.4GB	Maxtor	90648D3	256k 9ms	£99	£116.33
30-64-6401	6.4GB	Quantum	EX6400AT	512k 9.5ms	£95	£111.63
30-70-6431	6.4GB	Seagate	ST36531A	512k 11ms	£95	£111.63
30-86-6401	6.4GB	Western Dig	AC26400AU	256k <9.5ms	£94	£110.45
30-75-6409	6.4GB	Toshiba	MK6409MAT	512k 13ms	£175	£205.63

					ex VAT	inc VAT
<b>7.5Gb - 10.8Gb</b>						
30-39-0750	7.5GB	Maxtor	90750D6	512k 9ms	£135	£158.63
30-24-3084	8.4GB	Fujitsu	MPC3084AT	256k 10ms	£115	£135.13
30-39-8454	8.4GB	Maxtor	90845D4	256k 9ms	£105	£123.38
30-86-8401	8.4GB	Western Dig	AC28400AU	256k 9.5ms	£119	£139.83
30-70-8641	8.6GB	Seagate	ST38641A	128k 11ms	£109	£128.08
30-70-9140	9.1GB	Seagate	ST39140A	512k 9.5ms	£135	£158.63
30-39-1000	10.0GB	Maxtor	91000D8	512k 9ms	£159	£186.83
30-30-4091	10.1GB	IBM	00K4091	512k 9.5ms	£123	£144.53
30-30-5261	10.1GB	IBM	03L5261	512k 9.5ms	£159	£186.83
30-24-3102	10.2GB	Fujitsu	MPC3102AT	256k 10ms	£132	£155.10
30-39-1020	10.2GB	Maxtor	91020D8	256k 9ms	£129	£151.58
30-64-1020	10.2GB	Quantum	EL10200AT	512k 9.5ms	£139	£163.33
30-86-1020	10.2GB	Western Dig	AC310200AU	256k 9.5ms	£159	£186.83
30-39-1080	10.8GB	Maxtor	91080D5	256k 9ms	£135	£158.63

					ex VAT	inc VAT
<b>11.5Gb +</b>						
30-64-1200	12GB	Quantum	TX12000AT 5.25"128k	12ms	£135	£158.63
30-64-1271	12.7GB	Quantum	EX12700AT 5.25"512k	9.5ms	£159	£186.83
30-30-4083	12.9GB	IBM	00K4083	512k 9.5ms	£155	£182.13
30-86-3130	13GB	Western Dig	AC313000AU	256k 9.5ms	£169	£198.58
30-39-1360	13.6GB	Maxtor	91360D8	256k 9ms	£165	£193.88
30-30-4071	14.4GB	IBM	00K4071	512k 9.5ms	£219	£257.33
30-30-4073	16.8GB	IBM	00K4073	512k 9.5ms	£209	£245.58
30-39-7288	17.2GB	Maxtor	91728D8	512k 9ms	£215	£252.63
30-30-2659	18GB	IBM	25L2659	2MB 9ms	£309	£363.08
30-30-2650	20.3GB	IBM	25L2650	2MB 9ms	£299	£351.33
30-30-2661	22GB	IBM	25L2661	2MB 9ms	£399	£468.83
30-30-2652	25GB	IBM	25L2652	2MB 9.1ms	£379	£445.33

All the above come with a 3 year warranty and are 3.5" wide unless stated otherwise. Ultra-IDE drives can also work as standard IDE/EIDE drives. We recommend the Promise PCI Ultra33 controller for optimized transfer rates.

**3 Year**  
WARRANTY

- 48Hr advance replacement
- Bulletin Board Service
- MaxFax™ 24-hr automated technical support
- Maxtor's commitment to total customer satisfaction
- Phone technicians available Monday - Friday

\* Applies to all Maxtor hard drives

**HARD DRIVES : ULTRA-IDE**

For SMC's unique guarantee : see page 2





No. FS40989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

CD-ROM technology was heralded as a breakthrough in data storage and transmission, but the first (single speed) drives were only of use in loading software or referencing data. As time went on, speeds increased so that as four-speed and eight-speed drives arrived, it was possible to run applications (including some games) from the CD. With today's 24- and 40-speed drives, even fast-moving animation can be run from the CD, enabling whole libraries of software and data to be stored and accessed without taking up valuable Hard Drive space. Technology has moved on again, so that with CD-ReWriters and Recorders it is now possible to store your own data in convenient CD format, and with the introduction of DVD CD-ROM drives providing enormous capacity of up to 17GB, the range of uses is extending to the most complex and demanding Multimedia applications.

## CD-ROM, DVD-ROM, DVD-VIDEO DRIVES

### CD-ROM DRIVES

#### SCSI - Internal

		ex VAT	inc VAT
<b>32 - speed</b>			
With data transfer 4800 KB/sec			
51-93-3200	Plextor PX32Tsi 85ms (T)	£69	£81.08
51-93-3210	Plextor PX32Csi 85ms (C)	£102	£119.85
51-75-6201	Toshiba XM6201B (T)	£57	£66.98
51-93-1532	Teac CD5325 (T)	£55	£64.63
<b>40 - speed</b>			
Data transfer 6000 KB/sec			
51-93-4000	Plextor PX40T5I 85MS (T)	£84	£98.70

#### SCSI - External

		ex VAT	inc VAT
<b>12 / 24 - speed</b>			
With data transfer 1800 KB/sec			
51-62-1412	Pioneer DRM-6324X 6-disc Autochanger	£325	£381.88
<b>32 - speed</b>			
Ultra SCSI, with data transfer 4800 KB/sec			
51-93-3205	Plextor PX32Tse 85ms (T)	£102	£119.85
51-93-3215	Plextor PX32Cse 85ms (C)	£139	£163.33
<b>40 - speed</b>			
Data transfer 6000 KB/sec			
51-93-4001	Plextor PX40T5E 85MS (T)	£131	£153.93

Plextor drives have a 2-year warranty (T) = Tray Loading. (C) = Caddy Loading

#### CD Caddies

**IMPORTANT:**  
These are only available when purchasing a CD-ROM Drive.  
51-95-9700 CD-ROM Caddy £9 £10.58

#### EIDE / ATAPI - Internal

		ex VAT	inc VAT
<b>24 - speed</b>			
MPC-3 Compatible, with data transfer 3600 KB/sec			
51-95-2432	Samsung SCR2432E	£35	£41.13
<b>32 - speed</b>			
MPC-3 Compatible, with data transfer 4800 KB/sec			
51-57-0588	Panasonic CR-588	£29	£34.08
51-48-0320	Mitsumi FX320	£30	£35.25
51-26-8322	LG G'star CRD-8322B 80ms	£29	£34.08
51-93-0532	Teac CD532E 85ms	£30	£35.25
51-95-3231	Samsung SCR3231E	£37	£43.48
<b>40 - speed</b>			
51-99-0400	Asus CD-S400, 6000 KB/sec	£39	£45.83

All above are tray loading, with software drivers and audio cable

#### Parallel Port

These plug into the Parallel (Printer) Port of your PC, and are fitted with an additional Parallel Port Interface so you can still use your printer with the drive connected.

#### Micro-Solutions BackPack

		ex VAT	inc VAT
Drives with sound have Microsoft Sound compatibility			
51-42-3200	32-speed	£109	£128.08
51-42-3204	32-speed with sound	£139	£163.33

#### Micro-Solutions Bantam

		ex VAT	inc VAT
The Bantam drive supports DOS, Windows 3x, 95 and NT. Drives with sound support 16-bit & 8-bit sound. Ultra slim design			
51-42-1004	Bantam 10-speed with sound	£119	£139.83
51-42-2400	Bantam 24-speed	£119	£139.83
51-42-2404	Bantam 24-speed with sound	£139	£163.33

#### Amacom EZCD

		ex VAT	inc VAT
The EZCD drive has a 256K cache and 125ms access time			
51-92-0032	32-speed	£90	£105.75
51-92-0040	40-speed	£105	£123.38
51-92-1040	40-speed with 16-bit sound	£150	£176.25

#### PCMCIA

		ex VAT	inc VAT
<b>Amacom EZCD Card</b>			
51-92-3032	32-speed, 256k cache	£110	£129.25
51-92-3040	40-speed, 256k cache	£120	£141.00
<b>Amacom EZCD Plus - BRAVO Drive</b>			
Can use as a standalone CD player. Power is drawn direct from your PC or via a mains adaptor/battery pack (supplied with 20x version).			
51-92-5020	20-speed, 125ms, 256k cache	£150	£176.25
51-92-4024	24-speed Super Slimline PCMCIA CDROM	£105	£123.38
<b>LG Electronics</b>			
51-26-8241	24-speed, 130ms, 128k cache	£115	£135.13

## PRODUCT LINK

**CD Sound Cables:**  
**See Page 22**



### LG DVD-ROM & CD-ROM DRIVES

Nobody is further ahead in IT than LG. £1.5m is spent every day on R&D and £2bn is being invested in a manufacturing plant in Wales, ensuring LG Electronics' position as a leading player in a very exciting digital future.

Lightning access to all areas with optical storage

#### DRD-820B Double Speed DVD-ROM Drive

- Plays all DVD-ROM Discs including MPEG2 discs with MPEG2 decoder card
- Single & dual Layer Support in DVD Mode
- Backwardly Compatible with CD-ROM, CD-R & CD-RW
- 2x Speed DVD-ROM Data Transfer (2.7MB/sec)
- 24x Speed CD-ROM Data Transfer (3.6MB/sec Max)

51-26-8200 **£75** (£88.13 inc.VAT)

#### CRD-8322B 32x MAX CD-ROM Drive

- Magnetised ball balance mechanism
- E-IDE/ATAPI Interface
- 4800KB/sec Max Data Transfer Rate
- CD-RW & CD-R compatible
- 80ms Access Time
- MPC III Compliant

51-26-8322 **£29** (£34.08 inc.VAT)

#### CRN-8240E 24x MAX EXTERNAL CD-ROM Drive

- Operates through PCMCIA attached
- E-IDE/ATAPI Interface
- Fast 130ms Average Access Time
- Max 1,950Kbytes/sec Sustained Transfer rate
- MPC III Compliant

51-26-8241 **£115** (£135.13 inc.VAT)



Website: <http://www.lge.co.kr>

### DVD-ROM DRIVES

DVD (Digital Versatile Disk) looks exactly like a normal CD, but stores over 26 times the amount of data. A standard DVD disk can hold over two hours of high quality MPEG-2 video with better-than-CD quality audio. DVD-ROM disks can be used to distribute all types of computer data with storage capacities from 4.7Gb to 17Gb, making them ideal for distribution of large multimedia/interactive applications such as music videos and full-length films.

		ex VAT	inc VAT
<b>EIDE/ATAPI internal</b>			
51-26-8200	LG 2x DVD (150ms), 24x CD (100ms)	£75	£88.13
51-15-0500	Creative ENCORE 5x kit with MPEG 2 decoder card & 5x DVDROM drive	£133	£156.28
59-15-5128	Creative 5x DVD, PCI-128 Sound Card, Speakers	£126	£148.05
51-57-8582	Panasonic SR8582	£69	£81.08
51-76-2500	Hitachi 4x DVD, 24x CD	£88	£103.40
51-75-1202	Toshiba 4.8x DVD, 32x CD	£89	£104.58
51-62-0103	Pioneer DVD-103	£89	£104.58



#### BRAVO DRIVE

Portable CD-ROM & Audio Player

FREE LIFETIME TECHNICAL SUPPORT

#### Key Features

- No need for bulky mains adaptors, powered by the PC
- Mobile Audio CD Player
- PCMCIA Type II connection
- Up to 3MB/sec (20 speed unit)
- Easy to install software drivers
- Fully hot swappable
- Can also be powered with optional mains adaptor or 6 AA batteries



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THE BEST YOU'LL GET

**CD-RECORDERS, RE-WRITERS & TOWERS**

For SMC's unique guarantee : see page 2

# TRAXDATA

## CDRW 4260 EL/PRO

52-95-4260

**£269**

£316.08 Inc.VAT



The Traxdata CDRW 4260 EL PRO supports rewritable CD media so that unlike standard CD media which when full can only be stored or thrown away you can erase the disk when full and use it again.

- 4 x write & 2 x rewrite capability
- Software supplied for CD mastering & packet writing

## Just Audio Recording Studio

05-95-1010

**£24**

£28.20 Inc.VAT



Just Audio Recording Studio allows even the novice CD-R user to create professional Audio CDs with complete ease.

- Record vinyl to CD directly from your hi-fi
- De-crackler and de-noiser to remove unwanted distracting noises
- Booklet label and inlay card editor
- Recording open sessions
- Allows you to make your own favourite CD compilations

## CDR4120 Pro Series

Internal 52-95-4120

**£185**

£217.38 Inc.VAT

External 52-95-4128

**£249**

£292.58 Inc.VAT



The Traxdata CDR4120 PRO is the world's fastest 4x Record, 12x Playback CD recorders.

- High speed CD ROM read capability
- Software Included enabling you to record up to 1.2GB on a single 650MB CD.
- Fast access and low CPU utilisation
- Supporting packet, disk at once and track at once recording modes
- Modes for internal, external, SCSI and Macintosh connection.

## CD-ROM JUKEBOXES

ex VAT Inc VAT

### Pioneer

These are Twenty-Four Speed External units  
51-62-1412 **DRM-6324X** - 6 CD's, 1 drive **£325** £381.88  
These are Quad-Speed External units

## CD-ROM TOWERS

ex VAT Inc VAT

All options listed are Full Tower SCSI CD ROM solutions

### Standalone PC use

#### Toshiba

With 8 bays and 7 CD ROM drives  
51-75-0908 32-speed option **£695** £816.63  
With 16 bays and 14 CD ROM drives  
51-75-1715 32-speed option **£1495** £1756.63

#### Plextor

With 8 bays and 7 CD ROM drives  
51-93-0809 32-speed option **£755** £887.13  
With 16 bays and 14 CD ROM drives  
51-93-1517 32-speed option **£1695** £1991.63

### Network CD Servers

Supplied with AXIS StorPoint™ CD Server modules

#### Toshiba

With 8 bays and 7 CD ROM drives  
51-75-6207 XM6207/AX - 32-speed option **£1095** £1286.63  
With 16 bays and 14 CD ROM drives  
51-75-6214 XM6214/AX - 32-speed option **£2095** £2461.63

#### Plextor

With 8 bays and 7 CD ROM drives  
51-93-0732 PXT732/AX - 32-speed option **£1195** £1404.13  
With 16 bays and 14 CD ROM drives  
51-93-1472 PXT1472/AX - 32-speed option **£2295** £2696.63

#### Hewlett Packard

With 8 bays and 7 CD ROM drives  
51-28-3277 J3277A - 32-speed option **£1299** £1526.33  
51-28-3278 J3278A - 32-speed option with 18MB RAM and external connector to daisy-chain additional towers **£1449** £1702.58

#### HP support Packs

99-28-5650 H5650A - 3-year for J3278A **£271** £318.43  
99-28-9479 H5479A - 3-year for J3277A **£180** £211.50

## CD-REWRITERS

ex VAT Inc VAT

CD-RW disks can be read in CD-RW, Multiread and DVD drives. CD-RW drives produce standard CD (CD-R) for all CD players! All SCSI drives require a controller card.

### Hewlett Packard Surestore

1 Mb cache : 2-speed write/rewrite, 6-speed play  
HP drives include software, 1 CD-RW and 1 CD-R media  
52-28-4381 7200e Parallel Port **£225** £264.38  
52-28-4392 8100i EIDE/ATAPI Int., 4x CD-RW **£215** £252.63  
Requires P133Mhz, 32MB RAM, Win'95, free IDE channel/EPP port.

### TraxData

99-95-0020 PRESSIT - CD Labeller **£17** £19.98  
2-speed write/rewrite, 6-speed play  
52-95-2260 2260EL Pro - SCSI Internal **£179** £210.33  
52-95-2262 2260EL Plus - EIDE Internal **£169** £198.58  
4-speed write, 2-speed rewrite, 6-speed play  
52-95-4260 4260EL Pro - SCSI Internal **£269** £316.08  
PCI SCSI controller & audio recording software are also available.

### Yamaha

4-speed write/rewrite, 16-speed play. Include 1x CDR media, 1x CDRW media & software.  
52-93-4417 CRW4416TVK - Internal SCSI kit **£225** £264.38  
52-93-4416 CRW4416TVK - Extnl SCSI kit **£265** £311.38

## PRODUCT LINK

**Media : see Page 21**

## CD-RECORDERS

ex VAT Inc VAT

All SCSI drives require a controller card.

### TraxData

4-speed write, 12-speed play  
Traxdata SCSI drives include WinOnCD to GO for Windows 95, 3.1x and NT4.  
52-95-4120 4120EL Pro - Internal SCSI drive **£185** £217.38  
52-95-4128 4120EL Pro - External SCSI drive **£249** £292.58

#### Accessories

26-95-0002 PCI SCSI Controller **£44** £51.70  
05-95-1010 Just Audio Recording Software **£24** £28.20

### Plextor

4-speed write, 12-speed play  
Plextor PX-R412C drives have 2Mb Cache and 190ms Access time. Supplied with software and a free caddy. Warranty is 1 year.  
52-93-4120 PX-R412Ci - Internal drive **£199** £233.83  
52-93-4125 PX-R412Ce - External drive **£235** £276.13  
8-speed write, 20-speed play. Tray-Loading with 4Mb Cache and 170ms Access time. Supplied with software..  
52-93-8200 PX-R820Ti - Internal drive **£279** £327.83  
52-93-8205 PX-R820Te - External drive **£349** £410.08



### SureStore 7200e CD Re-Writer

52-28-4381

**£225**

£264.38 Inc.VAT



The HP SureStore CD Writer allows you to write, update and rewrite up to 650MB of data on one CD. It's a complete solution in a box, using industry-standard software to allow you to create photo, audio or simple data libraries at minimal cost. And with the combination of HP and SMC, you know you're getting not only the best-quality product, but the most dedicated service available in the market.

## Easy CD Creator™ Deluxe Version 3.5

01-91-2445

**£55**

£64.63 inc.VAT

### NOW YOU CAN :

- > Store your photographs & video
- > Save your presentations & graphics
- > Back up your important files to CD
- > Duplicate CD's with CD Copier

Write your own CD's with CD-Recordable (CD-R) and CD-Writable (CD-RW) players. Optimized for Windows 95 and NT v.4, featuring easy to use CD Creation software, enhanced CD Spin Doctor, Picture CD Creator, PhotoRelay, Video CD Creator, Sound Editor and Session Selector software. Supplied with audio cable.



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ALL MAJOR CREDIT CARDS ACCEPTED



No. FS40989

**LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !****Why do I need to back up ?**

For many people, making sure that their data is safe only ever becomes important when the data isn't there any more !  
Imagine how many hours it would take to re-install software, set up all your applications as you had them before and then re-type all your work!

At SMC, we offer every kind of option, from parallel port devices which plug into your printer port to advanced SCSI DAT and Autoloader equipment, supporting from a basic 400Mb right through to a massive 144Gb.

Call us now for the solution to fit your requirements.

**BACKUP : TAPE, DAT & DLT DRIVES****DAT DRIVES**

ex VAT Inc VAT

**Internal drives****2Gb : 11Mb/min**

Tape type (see Page 21) - B1		
42-13-0200 Seagate 4320	£329	£386.58
42-71-0020 Sony SDT-2000E	£329	£386.58

**4Gb : 22Mb/min**

Tape type (see Page 21) - B1		
42-13-0400 Seagate 4324	£349	£410.08

**5Gb : 22Mb/min**

Tape type (see Page 21) - B1 or B2		
42-71-0040 Sony SDT-5200	£359	£421.83

**4 - 8Gb : 44Mb/min**

Tape type (see Page 21) - B1 or B2		
42-28-0140 HP DAT C1599A	£399	£468.83
42-28-2067 HP SureStore DAT8i	£479	£562.83
42-84-4000 Wangdat 3400DX	£379	£445.33
42-13-0800 Seagate 4326	£445	£522.88
42-71-0090 Sony SDT-5000 (22Mb/min)	£399	£468.83
42-71-0080 Sony SDT-7000 QUAD	£399	£468.83

**12 - 24 GB : 44Mb/min**

Tape type (see Page 21) - B1, B2 or B3		
42-28-0240 HP DAT C1554A	£579	£680.33
42-28-2070 HP SureStore DAT24i DDS-3	£675	£793.13
42-71-0120 Sony SDT-9000 (22Mb/min)	£559	£656.83

**64 GB Autoloaders**

Tape type (see Page 21) - B1 or B2		
42-71-0320 Sony TSL-7000 (22Mb/min)	£1167	£1371.23

**72 - 144 GB Autoloaders**

Tape type (see Page 21) - B1, B2 or B3		
42-28-7144 HP DAT C5648A DDS-3 (6 tapes)	£1599	£1878.83

**External Drives****2GB : 11Mb/min**

Tape type (see Page 21) - B1		
42-28-0125 HP DAT C1534-X	£299	£351.33
42-13-0205 Seagate 4350	£399	£468.83

**4GB : 22Mb/min**

Tape type (see Page 21) - B1		
42-28-0135 HP DAT C1536-X	£329	£386.58
42-28-2055 HP SureStore 5000-X	£389	£457.08
42-84-2005 Wangdat 3200-X	£479	£562.83
42-13-0405 Seagate 4354	£419	£492.33

**4 - 8GB : 44Mb/min**

Tape type (see Page 21) - B1 or B2		
42-28-0145 HP DAT C1599A-X	£469	£551.08
42-28-2069 HP SureStore DAT8e	£549	£645.08
42-84-4005 Wangdat 3400DX-X	£555	£652.13
42-13-0805 Seagate 4356	£545	£640.38
42-71-0095 Sony SDT-5000/X (22Mb/min)	£515	£605.13

**12 - 24GB : 44Mb/min**

Tape type (see Page 21) - B1, B2 or B3		
42-28-2073 HP SureStore DAT24e DDS-3	£749	£880.08
42-84-9005 Wangdat TS3900e 12-24Gb, DDS-3	£625	£734.38

**64GB Autoloaders**

Tape type (see Page 21) - B1 or B2		
42-71-0325 Sony TSL-7000 (22Mb/min)	£1249	£1467.58

**72 - 144GB Autoloaders**

Tape type (see Page 21) - B1, B2 or B3		
42-28-2144 HP SureStore DAT24X6e DDS-3 (6 tapes)	£1799	£2113.83

**AIT DRIVES**

The latest evolution in backup technology with features like memory in cartridge media and self-cleaning heads - backing up your mission-critical files has never been quicker or easier.

ex VAT Inc VAT

**AIT - Advanced Intelligent Tape**

Tape type (see Page 23) - F3		
48-13-2500 Int 50GB AIT Drive, SCSI 2	£1495	£1756.63
48-13-6500 Ext 50GB AIT Drive, SCSI 2	£1625	£1909.38

**DLT DRIVES**

DLT technology offers high performance with exceptional reliability for backup operations involving the new generation of high end servers & workstations.  
Fast backup speeds are combined with advanced error detection to give complete peace of mind.

ex VAT Inc VAT

**Hewlett Packard SureStore**

Tape type (see Page 21) - F2		
42-28-1579 DLT40e 40Gb External	£1949	£2290.08
42-28-5658 DLT70e 70Gb External	£3995	£4694.13

**TAPE DRIVES**

ex VAT Inc VAT

**HP Colorado Travan****1.6 - 3.2 GB - 9.5MB/min**

Tape type (see Page 21) - A3		
48-10-2000 T3000 Internal	£95	£111.63

**2.5-5.0GB**

Tape type (see Page 21) - A5		
48-10-2505 HPC5GB/ATAPI EIDE Internal	£117	£137.48
48-10-2509 HPC5GB/PP P/Port	£144	£169.20

**4-8 GB**

48-10-4805 HPC8GB/ATAPI EIDE Internal	£155	£182.13
48-10-4809 HPC8GB/PP P/Port External	£179	£210.33
42-28-8000 HP T41 Surestore Tape SCSI Internal	£209	£245.58
48-28-8005 HP T4E Surestore Tape SCSI External	£264	£310.20

**HP Travan Surestore****20 GB**

Tape type (see Page 21) - A6		
48-28-4394 SST201 SCSI Internal	£259	£304.33
48-28-4395 SST20E SCSI External	£319	£374.83

Includes backup software for NT, 95 &amp; Netware

48-28-4401 SST20X1 SCSI Internal	£319	£374.83
48-28-4402 SST20XE SCSI External	£379	£445.33

Includes backup software for NT, 95 &amp; Netware, &amp; disaster recovery software for NT &amp; Netware.

**Iomega Ditto****Ditto 2000 2GB, 19MB/min**

Tape type (see Page 21) - E1		
46-35-2000 Internal Drive	£59	£69.33

**Ditto Max Pro 3-10GB, 36MB/min**

Tape type (see Page 21) - E2, E3, E4 OR E5		
46-35-3010 Internal Drive	£139	£163.33
46-35-3015 Parallel Port Drive	£169	£198.58

**ISA Controller**

26-35-0030 DITTO-DASH	£19	£22.33
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**Seagate****4GB Hard Drive interface - 54MB/min**

Tape type (see Page 21) - C7 & A4		
48-13-8000 TST8000R-A EIDE Internal	£154	£180.95
48-13-8005 TST8000R-S SCSI Internal	£175	£205.63
48-13-8015 TST8000ES-S SCSI External	£199	£233.83

**TAPE SUPPORT PACKS**

ex VAT Inc VAT

**Hewlett Packard**

99-28-9461 H5461A - SureStore Tape T41	£35	£41.13
99-28-9462 H5462A - SureStore 2000/5000, DAT 8	£47	£55.23
99-28-9464 H5465A - SureStore 6000	£66	£77.55
99-28-9471 H5471A - SureStore 12000	£118	£138.65
99-28-9475 H5475A - SureStore Tape 30e DLT	£140	£164.50
99-28-9485 H5485A - SureStore Tape 70e DLT	£299	£351.33
99-28-9511 H5511A - SureStore Tape 40e DLT	£192	£225.60

**PRODUCT LINK****Backup Software : Page 9****Hewlett Packard****Intelligent data storage solutions**

Whatever the size of your business, however skilled the IT user, HP has a system that will suit your needs.

**HP Colorado 5GB & 8GB External**

Full-system protection for desktop and mobile PCs

The HP Colorado 5GB has changed the face of desktop and mobile PC backup. This is the high-performance, high-capacity solution for customers who want to keep costs down, providing full-system protection and maximising price/performance.

- > Full-system protection
- > High performance at a competitive price
- > Capacity growth
- > Easy installation
- > HP service and support

48-10-2505 **£117** (£137.48 Inc.VAT)48-10-2509 **£144** (£169.20 Inc.VAT)**HP SureStore Tape**

Cost-effective backup with a complete software solution for entry-level LANs

For small-business customers who want an affordable, easy-to-use backup system for their entry-level network, this is a complete solution at an affordable price.

- > Complete solution
- > Affordable, high-speed network backup
- > Full system protection for desktop PCs
- > Industry-leading reliability
- > HP service and support

48-28-8000 **£209** (£245.58 Inc.VAT)48-28-8005 **£264** (£310.20 Inc.VAT)**HP SureStore DLT 40e & 70e External**

High-performance backup for high-end servers

Customers needing to protect mission-critical data will want the best solution money can buy. The HP SureStore DLT40 and DLT70 will meet their demanding performance requirements with the highest levels of reliability and data integrity.

- > Greater flexibility
- > Industry-leading performance and capacity
- > Industry-leading reliability
- > HP service and support



DLT 40e (40Gb capacity)

42-28-5658 **£3995** (£4694.13 Inc.VAT)42-28-1579 **£1949** (£2290.08 Inc.VAT)

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**Midlands - 0800 597 6 333**

**North - 0800 597 7 333**

**Scotland - 0800 597 8 333**

**FAX : 01753 524443**

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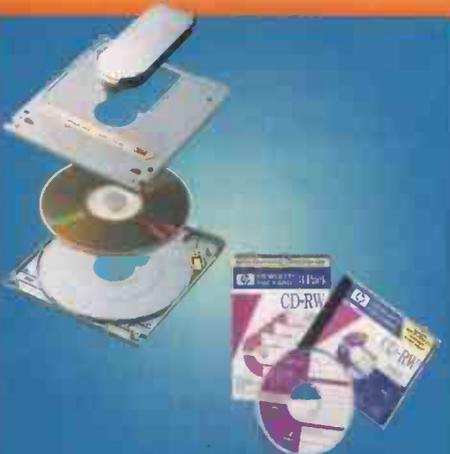
**REMOVABLE MEDIA**

		ex VAT	inc VAT	ex VAT	inc VAT	ex VAT	inc VAT
		Qty 1-4	Qty 5-19	Qty 20+			
95-35-0101	lomega Zip 100MB, Single	£8	£9.40	£7	£8.23	£6	£7.05
95-35-0210	lomega Zip 100MB, 10 Pack grey	£65	£76.38	£60	£70.50	£58	£68.15
95-35-0106	lomega Zip 100MB, 6 Pack multi-col	£39	£45.83	£38	£44.65	£37	£43.48
95-35-0110	lomega Zip 100MB, 10 Pack multi-col	£79	£92.83	£74	£86.95	£72	£84.60
95-35-0120	lomega Zip 100MB, 20 Pack multi-col	£125	£146.88	£124	£145.70	£121	£142.18
95-35-1001	lomega Jaz 1GB, Single	£55	£64.63	£51	£59.93	£48	£56.40
95-35-2001	lomega Jaz 2GB, Single	£65	£76.38	£60	£70.50	£58	£68.15
95-73-5088	Syquest 5.25" 88MB, Single	£28	£32.90	£25	£29.38	£23	£27.03
95-73-5200	Syquest 5.25" 200MB, Single	£40	£47.00	£37	£43.48	£35	£41.13
95-73-1000	Syquest 1.0GB SparQ, Single	£28	£32.90	£23	£27.03	£21	£24.68
95-73-1500	Syquest 1.5GB SyJet, Single	£51	£59.93	£43	£50.53	£40	£47.00



**CD-ROM & OPTICAL MEDIA**

CD-ROM		ex VAT	inc VAT	ex VAT	inc VAT	ex VAT	inc VAT
		Qty 1-4	Qty 5-19	Qty 20+			
95-97-0774	TRAX CD Re-writable, CD-RW players	£9	£10.58	£7	£8.23	£5	£5.88
95-97-4403	HP CDR media, 5 pack	£8	£9.40	£6	£7.05	£5	£5.88
95-97-4404	HP CD-RW media, 5 pack	£47	£55.23	£39	£45.83	£35	£41.13
95-97-5274	Phillips CDR media, 5 pack	£8	£9.40	£7	£8.23	£6	£7.05
95-97-5174	Maxell CDR media, 5 pack	£7	£8.23	£6	£7.05	£5	£5.88
95-97-5074	Verbatim CDR media, 5 pack	£7	£8.23	£6	£7.05	£5	£5.88
95-97-0874	Trax CDR silver, sleeved, 10 pack	£11	£12.93	£10	£11.75	£9	£10.58
95-97-5374	Trax CDR media, 5 pack	£9	£10.58	£8	£9.40	£7	£8.23
95-97-5474	Trax CDR media, 20 pack	£20	£23.50	£20	£23.50	£20	£23.50
95-97-7174	CD Gold 74	£3	£3.53	£2	£2.35	£1	£1.18



**Optical**

95-97-0128	128MB, (LMD300)	£10	£11.75	£8	£9.40	£7	£8.23
95-97-0230	230MB, Fujitsu M2512A (OM230)	£8	£9.40	£7	£8.23	£6	£7.05
95-97-0640	640MB, Fujitsu M2513A (OM640)	£18	£21.15	£17	£19.98	£16	£18.80
95-97-0653	650MB, Panasonic LF1004-PD Drive	£15	£17.63	£16	£18.80	£14	£16.45
95-97-1300	1.3GB, HP C1716T, HP C2550A	£28	£32.90	£24	£28.20	£22	£25.85
95-97-1500	1.5GB, Panasonic LF7304, LF7300B	£82	£96.35	£77	£90.48	£72	£84.60

**FLOPPY/SUPER FLOPPY DISKS**

		ex VAT	inc VAT	ex VAT	inc VAT	ex VAT	inc VAT
		Qty 1-4	Qty 5-19	Qty 20+			
95-93-0140	1.44MB 3.5" DS,HD (Box-10)	£1	£1.18	£4	£4.70	£3	£3.53
95-71-0144	Sony - 1.44MB 3.5" DS,HD (Box-10)	£7	£8.23	£5	£8.23	£4	£4.70
95-95-0144	3M - 1.44MB 3.5" DS,HD (Box-10)	£7	£8.23	£5	£9.40	£4	£4.70
95-95-1200	3M - 120MB 3.5" LS-120	£11	£12.93	£11	£12.93	£10	£11.75



**TAPE MEDIA**

Tape Type		ex VAT	inc VAT	ex VAT	inc VAT	ex VAT	inc VAT
		Qty 1-4	Qty 5-19	Qty 20+			
95-95-0805	A1 TR1 (QIC Formatted)	£14	£16.45	£13	£15.28	£12	£14.10
95-95-3405	A3 TR3 (QIC Formatted)	£17	£19.98	£15	£17.63	£14	£16.45
95-95-8005	A4 TR4 (QIC Formatted)	£22	£25.85	£20	£23.50	£18	£21.15
95-95-2505	A5 TR4/5GB (QIC Wide Formatted)	£18	£21.15	£18	£21.15	£17	£19.98
95-95-8015	A6 TR5	£39	£45.83	£35	£41.13	£32	£37.60
95-95-9409	B1 DAT 4mm 90metre DDS-1	£5	£5.88	£4	£4.70	£3	£3.53
95-95-9412	B2 DAT 4mm 120metre DDS-2	£9	£10.58	£8	£9.40	£7	£8.23
95-95-9417	B3 DAT 4mm 125metre DDS-3	£18	£21.15	£16	£18.80	£14	£16.45
95-95-0345	C4 DC3000XL pre-formatted	£12	£14.10	£10	£11.75	£9	£10.58
95-95-4005	C7 DC3080XLF (QIC Formatted)	£20	£23.50	£17	£19.98	£15	£17.63
95-95-0520	D3 DC6525	£13	£15.28	£10	£11.75	£9	£10.58
95-35-2004	E1 Ditto 2000 Media	£14	£16.45	£13	£15.28	£12	£14.10
95-35-2003	E2 DittoMax 3GB Media	£14	£16.45	£12	£14.10	£11	£12.93
95-35-2005	E3 DittoMax 5GB Media	£17	£19.98	£16	£18.80	£15	£17.63
95-35-2007	E4 DittoMax 7GB Media	£19	£22.33	£17	£19.98	£16	£18.80
95-35-2010	E5 DittoMax Pro 10GB Media	£23	£27.03	£20	£23.50	£19	£22.33
95-28-0514	F1 30GB Media for HP DLT Tape III	£29	£34.08	£27	£31.73	£25	£29.38
95-64-1530	F1 30GB Media for Quantum DLT III	£29	£34.08	£27	£31.73	£25	£29.38
95-28-5141	F2 40GB Media FOR HP DLT Tape IV	£59	£69.33	£54	£63.45	£50	£58.75
95-64-3570	F2 40GB Media for Quantum DLT IV	£55	£64.63	£50	£58.75	£46	£54.05
95-13-0170	F3 50GB Media for Seagate AIT	£59	£69.33	£57	£66.98	£55	£64.63
95-95-9130	DAT 4mm Tape Cleaner	£10	£11.75	£8	£9.40	£7	£8.23



**NOTES :** Tape type codes (eg A1) in column 2 refer to codes given for Tape/DAT drives on page 22. Please note that we also supply DC2120, XL, DC3000XL, DC6250 and DC9100 media - call for details.

**MEDIA SELECTOR**

For SMC's unique guarantee : see page 2

**SMC Direct is a trading division of :**

**SMC Computers Plc**

**253-257 Farnham Rd Slough Berkshire SL2 1HA**



**ALL MAJOR CREDIT CARDS ACCEPTED**



No. F540989

**LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !**

Whether it's a cable, a fitting kit, a drive box to house an external device, a keyboard or a mouse, you can be sure that the product you buy from SMC will be of the highest quality. Not only are all our products covered by a full guarantee, but our dedicated Customer Support team handle any problems so that you can be assured of the best service available.

**KEYBOARDS, MICE, JOYSTICKS & DATA CABLES****DATA CABLES**

ex VAT inc VAT

**Internal Cables**

Note : Cable lengths may vary - lengths given are nominal sizes.

**SCSI - 50 pin**

75-95-1501	Single drive, 19 inches	£5	£5.88
75-95-1502	Dual drive, 38 inches	£6	£7.05
75-95-1503	Triple drive, 38 inches	£10	£11.75
75-95-0500	Custom made to order, as required.		
	Prices from :	£10	£11.75

**Wide SCSI - 68 pin**

75-95-1703	Triple drive, for Wide SCSI	£20	£23.50
75-95-1705	5 drives, for Wide SCSI	£25	£29.38

**IDE - 40 pin**

75-95-1401	Single Drive - 12.5"	£5	£5.88
75-95-1402	Dual Drive - 18" (4" gap)	£6	£7.05
75-95-1403	Dual Drive - 20" (9" gap)	£15	£17.63
75-95-0400	Custom made, up to 18"		
	(Max of 2 drives/cable) From :	£10	£11.75

**External Cables****SCSI**

All cables are a nominal 1 metre in length unless specified otherwise.

75-95-3521	25-pin D to 50-pin Centronics	£6	£7.05
75-95-3719	25-pin D to 68-pin Wide SCSI	£25	£29.38
75-95-3551	50-pin Centronics to 50-pin Centronics	£8	£9.40
75-95-3552	50-pin Centronics to 50-pin Centronics		
	- 2 metres	£9	£10.58
75-95-3571	50-pin Micro D to 50-pin Centronics	£10	£11.75
75-95-3572	50-pin Micro D to 50-pin Centronics		
	- 2 metres	£12	£14.10
75-95-3721	50-pin Micro D to 25-pin D	£10	£11.75
75-95-3771	50-pin Micro D to 50-pin Micro D	£10	£11.75
75-95-3661	Wide SCSI to Wide SCSI	£20	£23.50

**SCSI Adaptors**

75-95-9019	SCA to 50-pin SCSI adaptor	£15	£17.63
75-95-9021	SCA to 68-pin SCSI adaptor	£19	£22.33

**Sound Cables**

75-75-0404	ATAPI to ATAPI, 4-4pin for EIDE CD-ROMS	£5	£5.88
75-57-0570	Panasonic Cable for SCSI CD-ROM only (not IDE)	£8	£9.40
75-75-0751	Toshiba Cable, 3-4 for 3xxx series	£3	£3.53
75-75-0757	Toshiba Cable, 4-4 for 4xxx series	£3	£3.53
75-75-0753	Toshiba Cable, 4-4 for 5xxx series	£3	£3.53

**Power Cables**

75-95-9357	Power Splitter 'Y' Cable - converts single drive power lead to double	£3	£3.53
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**Printer (Parallel Port) Cables**

75-95-6002	1.8 metres	£5	£5.88
75-95-6003	3.0 metres	£7	£8.23
75-95-6005	5.0 metres	£9	£10.58

**USB Cables**

Universal Serial Bus - the latest innovation in the peripheral market allowing 128 devices to be connected to a PC with USB ports.

75-95-2000	A-A type USB cable	£9	£10.58
75-95-2004	B-B type USB cable	£9	£10.58
75-95-2008	A-B type USB cable	£9	£10.58

**Entrega**

75-02-0012	0.5 metre A-B USB cable	£4	£4.70
75-02-0001	1 metre A-B USB cable	£5	£5.88
75-02-0002	2 metre A-B USB cable	£6	£7.05
75-02-0005	5 metre A-B USB cable	£8	£9.40

**NOTE** : All cables are usually ex-stock, but orders for custom-made Internal Cables (see above) may sometimes require an extra day to process.

**MICE**

ex VAT inc VAT

82-53-3153	MS compatible mouse 9 pin serial, 2 buttons	£6	£7.05
82-50-0003	Microsoft basic mouse 9 pin serial & PS/2	£12	£14.10
82-50-0004	Microsoft Wheel Mouse 2 buttons/wheel - 9 pin serial & PS/2	£15	£17.63
82-50-0625	Microsoft Intellimouse Trackball 2 buttons/wheel - 9 pin serial & PS/2	£27	£31.73
82-50-0610	Microsoft Intellimouse USB USB connector (requires Windows 98)	£26	£30.55
82-50-0615	Microsoft Intellimouse Pro 9 pin serial & PS/2	£32	£37.60
82-50-3192	Microsoft Home 9 pin serial, 2 buttons	£15	£17.63
82-50-0002	Microsoft V.2 - 9 pin serial & PS/2	£24	£28.20
82-50-0605	Microsoft Intellimouse 9 pin serial & PS/2	£25	£29.38
82-97-1511	Pilot Mouse New shape 9-pin serial, 3 buttons	£15	£17.63
82-97-1513	Pilot Mouse New shape 6-pin DIN, 3 buttons	£15	£17.63
82-97-0035	Pilot Mouse Plus 3 buttons/wheel 9 pin serial & PS/2	£15	£17.63
82-97-0021	Mouseman 4 buttons 9-pin serial & PS/2	£24	£28.20
82-97-1396	Trackman Marble 3 buttons, marble infra-red technology	£29	£34.08

**JOYSTICKS**

ex VAT inc VAT

<b>Microsoft</b>			
82-50-2010	SideWinder pad Digital Game Pad for Windows 95 only Daisy-chain up to 4 pads per PC	£24	£28.20
82-50-2050	SideWinder USB Connects via USB under Windows 98 or a standard 15-pin joystick port	£35	£41.13
82-50-2070	SideWinder Force Feedback Pro Feel the force! The joystick actually shakes in your hand as you fire!	£79	£92.83
82-50-2030	Freestyle Pro GamePad To control the game you tilt the pad rather than push a thumbpad.	£35	£41.13
82-50-2090	Force Feedback Steering Wheel The wheel vibrates when you hit the kerb.	£109	£128.08

**GRAVIS**

82-91-2400	PC Pro Joystick - 5 Fire buttons, analogue, adjustable handle settings	£18	£21.15
82-91-2501	PC Gamepad Pro Digital 10-button gamepad	£24	£28.20

**KEYBOARDS**

ex VAT inc VAT

82-50-3505	For Windows 95/98 (105 key) 5-pin (AT)	£9	£10.58
82-50-3509	For Windows 95/98 (105 key) 6-pin Din (PS/2)	£10	£11.75
82-50-0012	MS Natural Elite (105 key) 6-pin Din & USB	£29	£34.08
82-91-3595	Cherry G81-3000 Lamb (105 key) 5-pin AT, soft touch	£25	£29.38
82-91-3597	Cherry G80-3000HFM AT (102 key) 5-pin AT, click	£39	£45.83
82-91-3599	Cherry G80-3000HSM (105 key) 6-pin Din (PS/2), click	£43	£50.53

**Microsoft Wheel Mouse**

82-50-0004

**£15**

£17.63 inc. VAT



Just plug Wheel Mouse into a serial or PS/2 port and it's ready to use. Install the enclosed IntelliPoint software and you can take advantage of the wheel to provide a fast, convenient way of scrolling through your documents.

**Microsoft Intellimouse Pro**

82-50-0615

**£32**

£37.60 inc. VAT



Ergonomic design includes a shape to support your hand and fingers, a slope which aligns your wrist, and easy-grip rubber soles. Add to that wheel features including zoom, scroll and auto-scroll, and you have a mouse that is both comfortable and an aid to faster, easier work.

**Push Reality****Beyond Sight And Sound !**

The Microsoft SideWinder Force Feedback Pro is a joystick that breaks new game play by introducing a new sensory experience to gaming - the sense of touch, or force - to the existing senses of sight and sound found in games.

**SideWinder Force Feedback Pro**

82-50-2070

**£79**

(£92.83 inc. VAT)

**Microsoft Natural Elite Keyboard**

To design a more comfortable keyboard, Microsoft conducted extensive ergonomic and usability research. The split, gently sloped shape, built-in palm rest and adjustable legs encourage a natural hand position and enable you to type comfortably in a relaxed posture.

82-50-0012

**£29**

£34.08 inc. VAT



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THE BEST YOU'LL GET

**SOUND CARDS**

ex VAT Inc VAT



Creative Labs SoundBlaster cards are designed to take advantage of Intel Pentium technology & require EIDE/ATAPI CD-ROM support. All Creative Labs products sold by SMC are full retail versions containing all required documentation, drivers and software.

**SB16**

53-15-1639 **SB16 Value Plug 'n Play**  
16bit FM Stereo, CD quality audio  
MIDI/joystick interface, ISA £18 £21.15

**AWE-64**

**AWE-64 Upgrades**

A memory upgrade allows you to download more sound fonts onto your card.

Each memory module is supplied with SoundFont Gold on CD.

19-15-6404 4Mb memory module £29 £34.08

**PCI range**

53-15-7100 **SoundBlaster 128 PCI**  
128-voice, 4-speaker support  
for windows 95/98 £32 £37.60

53-15-7150 **SoundBlaster Live256 PCI**  
Full environmental audio  
Software includes Unreal & Cubasis £95 £111.63

53-15-7160 **SoundBlaster Live256 Value Edition**  
Environmental audio for the gamer  
complete with Unreal £49 £57.58



**SonicStorm<sup>Pro</sup>**

- Hi-fi quality PCI sound card with wavetable MIDI & 3D positional audio
- Support for DOS & SoundBlaster
- S/P-DIF output for digital recording direct to DAT or miniDisc
- Very low CPU usage for faster gameplay
- Includes Yamaha SoftSynth and JetAudio



**DVD Player**

- Second Generation DVD MPEG 2 decoder card for PC
- Stunning quality, high-definition digital video
- TV output to view the action on large-screen TV
- Stereo output for sound card connection and S/P-DIF output for Dolby Digital 5.1
- Comprehensive easy to use control centre
- Multiple camera angle and video format support (4:3 & 16:9 widescreen)



**Sirocco**

- Studio quality speaker system for the PC designed using pro audio techniques
- Delivers 100W true RMS (delivers over 1000W PMPO)
- Includes two satellite speakers, each with bass/midrange and separate tweeter, a sub-woofer and active filter/power amps
- Complete reproduction of audio frequency range & ultra low distortion
- For use with PC, game consoles, CD, MiniDisc, TVs, or DVD players

**SPEAKERS**

ex VAT Inc VAT



57-15-0020	<b>CSW20</b> - 5 Watt RMS	£11	£12.93
57-15-0050	<b>CSW50</b> - 11Watt RMS	£22	£25.85
57-15-0100	<b>CSW100</b> (with Amplifier) 17Watt RMS	£35	£41.13
57-15-0200	<b>CSW200</b> (with Amplifier) 23Watt RMS	£64	£75.20
57-15-0350	<b>CSW350</b> (with Amplifier) 68Watt RMS	£104	£122.20
57-15-1000	<b>Creative 4-Point speakers</b> 10Watt RMS Surround Sound	£42	£49.35



57-93-3105 **LCS-1024** - 10 watt £34 £39.95



57-93-7133	<b>M15</b> - 10 watt	£35	£41.13
57-93-7135	<b>SS510</b> Sub Woofer for M15	£46	£54.05
57-93-0515	<b>YST-MSW5</b> Sub Woofer	£40	£47.00
57-93-5525	<b>YST-MSW5</b> Sub Woofer + Speakers	£55	£64.63
57-93-7100	<b>YST-M100</b> - 20 watt 3D with tweeters	£83	£97.53



57-50-0080 **Digital Sound System 80** - USB  
(no sound card required), Win98 only £119 £139.83



57-97-1000 **Sirocco 100W**  
Subwoofer & speakers £169 £198.58

**Superb analogue sound, superior digital sound.**  
Now you can enjoy high-end, home audio elegance and power on your PC. Microsoft Digital Sound System 80 uses the latest digital technology to deliver rich, crisp and clean audio. It's the only complete multimedia PC-audio package that delivers earthshaking bass and distortion-free sound!



**Digital Sound System 80**  
57-50-0080

**£119**

£139.83 Inc. VAT

**PRODUCT LINK**

**CD-ROMs : see Page 18**

**Memory : see Pages**

**10 - 11**

**New Product !**



**Sound Blaster Live!**  
**PCI Sound Card**

53-15-7150

**£95**

(£111.63 Inc. VAT)



53-19-2055 **Sonic Impact PCI**  
Next generation sound solution  
4-speaker support with 64-voice  
wavetable playback £22 £25.85



53-97-1010 **Sonic Storm Pro**  
3D positional system  
HiFi quality audio with software £33 £38.78

**MULTIMEDIA KITS**

ex VAT Inc VAT

59-15-5128	<b>Sound Blaster PCI-128 Discovery</b> 5-speed DVD-ROM drive, PCI 128 sound card, 4.1 Surround Sound Speakers & UNREAL: the game	£126	£148.05
59-15-3300	<b>PCI-128 + 4 Point Speakers</b> PCI 128 sound card, 4 Point Surround Sound Speakers for full environmental audio support	£68	£79.90

**Sound Blaster PCI-128 Discovery -  
The Market Leader in Multimedia  
Kits !**

In addition to the SoundBlaster PCI 128 sound card, it contains the 5x DVD-ROM (the latest DVD technology, which also works like a standard CD-ROM drive, from Creative Labs) and 4.1 Surround Sound Speakers. It also comes complete with Windows 95/98 drivers and UNREAL, one of the most popular, recent PC games.

**SOUND CARDS, SPEAKERS & MULTIMEDIA KITS**

For SMC's unique guarantee : see page 2





No. FS40989



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

## What is AGP?

Designed by Intel, AGP stands for Accelerated Graphics Port.

AGP streamlines the flow of data between the processor, graphics accelerator and system memory, delivering a new level of rich media and graphics performance to the PC. For the home user, AGP supports improved texture rendering in 3D software, including games, entertainment, educational and digital imaging applications. Business users will see smooth performance in 3D applications from CAD programs to sophisticated data visualisation and web authoring tools.

AGP frees system resources with its high bandwidth and is supported in all new Intel-based BX chipsets (and older style LX) sold by SMC - See ASUS and Intel in the motherboards section.

# GRAPHICS, TV & VIDEO CARDS

## GRAPHICS & TV CARDS



ex VAT inc VAT

### Diamond Stealth 3D series

#### G460 - Second generation AGP graphics

The G460 is based on the innovative Intel 1740 chipset

64-19-4600 8MB SGRAM £44 £51.70

#### Stealth 220 PCI

The 220 PCI is based on Rendition V2100

64-19-2200 4MB SGRAM £29 £34.08

### Diamond Speedstar 3D Series

The SiS 6326 chipset allows Diamond the flexibility to offer two flavours of this card. The Speedstar 3D has 2D and 3D capabilities along with MPEG-1 video acceleration. The Speedstar DVD goes even further to include TV-out functionality and full motion MPEG-2 DVD. 1280x1024 (64k colours) @ 75Hz. 1280x1024 (16.7m colours) @ 75Hz. 175MHz RAMDAC, 100MHz SGRAM. AGP only.

64-19-0131 Speedstar 3D - 8Mb SGRAM £31 £36.43

64-19-0132 Speedstar DVD - 8Mb SGRAM £35 £41.13

### Diamond FireGL Series

Premium performance 2D/3D professional graphics.

#### 1000Pro Series

Based on 3DLabs Permedia 2 graphics chip and rendering engine.

64-19-1108 8Mb SGRAM - AGP £89 £104.58

### Diamond Viper Series

The NVIDIA RIVA chipset gives true 128-bit power for Incredible 2D, 3D & video under Windows 95 or NT.

Hardware-accelerated OpenGL, with multiple monitor support for multiple cards.

1600x1200 (64k colours), 1152x864 (16.7m colours) at 85Hz.

230MHz RAMDAC, 100MHz SGRAM.

64-19-0552 V550 PCI - 16Mb SGRAM £99 £116.33

64-19-0554 V550 AGP - 16Mb SGRAM £95 £111.63

64-19-0556 V550 PCI & TV-Out - 16Mb SGRAM £95 £111.63

### Diamond Monster

3D add-on card which works in conjunction with your existing card.

64-19-8001 Voodoo 3D 4MB PCI EDO-RAM £62 £72.85

64-19-0100 Voodoo 3DII 8MB PCI (no games) £75 £88.13

64-19-0112 Voodoo 3DII 12MB PCI (no games) £85 £99.88

#### Diamond Monster Fusion

All-in-one 3D solution with the power of the 3DFX Banshee.

64-19-0702 Monster Fusion 16MB PCI £76 £89.30

64-19-0704 Monster Fusion 16MB AGP £76 £89.30



ex VAT inc VAT

### Matrox Millennium II

Optimized 64-bit MGA-2164W dual-ported processor, 250MHz

flicker-free RAMDAC.

64-95-6004 4Mb WRAM (Max 16Mb) for AGP £99 £116.33

#### Matrox Millennium II WRAM PCI/AGP upgrades

64-95-0042 4Mb upgrade £52 £61.10

64-95-0082 8Mb upgrade £99 £116.33

64-95-0122 12Mb upgrade (for 4Mb board only) £139 £163.33

#### Matrox Millennium (not MII) MPEG

64-95-1036 Media XL-MPEG board £189 £222.08

### Matrox Millennium G200

Blistering 2D and 3D - 2x AGP utilising 2 64bit channels. 250MHz.

64-95-0208 8Mb (Max 16Mb) for AGP £79 £92.83

64-95-0210 8MB Marvel £135 £158.63

64-95-8200 8MB SGRAM upgrade for above £45 £52.88

### Matrox Productiva G100

Excellent entry 2D AGP graphics performance. 230MHz.

64-95-5008 8Mb for AGP £49 £57.58

### Matrox Mystique

#### Mystique 220 Rainbow Runner

This is a plug-in 'daughter board' video upgrade with sound being captured through your normal sound card. Video output is via PC to PAL and there is an easy-to-use on-screen PC-VCR remote.

Hardware MPEG1 on board enables video capture/playback, with both live and still frame capture. High-quality video editing, conferencing and recording are also included.

64-95-1199 For 2Mb or 4Mb (original) Mystique £99 £116.33

#### Mystique G200

Based on the same engine as the Millennium G200, with SDRAM as standard to provide a lower-cost solution. The G200 also comes with PC to TV output along with a 230MHz RAMDAC and is upgradable to 16MB, DVD and Rainbow Runner technology.

64-95-0218 8MB SDRAM AGP 2x - retail version £79 £92.83

64-95-8201 8MB upgrade for above £29 £34.08

### G200 Add-Ons

Bringing video capture to all G200 users.

64-95-0200 G200 Series Rainbow Runner £99 £116.33



### iomega buz

62-35-0700 Video capture & playback £149 £175.08



ex VAT inc VAT

### Orchid Righteous 3D

3D add-on card which works in conjunction with your existing card.

64-53-2030 Voodoo3D 4MB PCI EDO-RAM £59 £69.33

64-53-2008 Voodoo 3DII 8MB PCI £109 £128.08

64-53-2012 Voodoo 3DII 12MB PCI £139 £163.33

**Righteous 3D**

64-53-2030

**£59**

£69.33 inc VAT  
(DOS/Windows 3.1x programs require accelerated drivers)

### Hauppauge!

### Hauppauge Win TV Cards

62-95-0105 Win TV PCI - Plug'n'Play card

125 channel £67 £78.73

62-95-0215 Win TV Radio - as above with

additional radio tuner £89 £104.58

**IMPORTANT** : for Windows 95 only.

The Win TV card enables frame grabbing & video clip capture, and

allows you to capture and display live video in a fully movable and

sizable window. It captures live video at 320 x 240 up to 15-25 FPS.

It supports resolutions up to 1600 x 1200 full colour display (Direct

Draw drivers required).



### Graphics Blaster Exxtreme

64-15-0423 4Mb SGRAM : 230MHz RAMDAC £59 £69.33

### Graphics Blaster Riva TNT

64-15-0410 16Mb AGP : 250MHz RAMDAC £72 £84.60

### 3D Blaster Voodoo2

3D add-on card which works in conjunction with your existing card.

64-15-0212 12Mb - PCI with 4 games (see below) £72 £84.60

### 3D Blaster Banshee

64-15-0430 16Mb - PCI : 250MHz RAMDAC £67 £78.73



### 3D Blaster Voodoo<sup>2</sup>

The 3D Blaster Voodoo2 brings a new dawn to 3D

graphics and intense gaming. The card is based on the

newest chipset from 3Dfx Interactive, and comes with 4

exciting "full version" games : G.Police, Incoming, Actua

Soccer 2 and Ultimate Race.

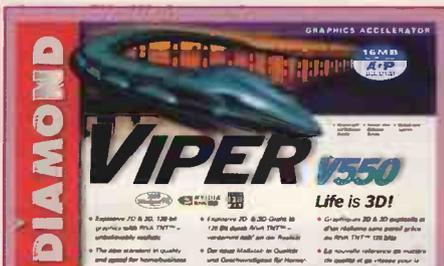
Designed for PC gamers who have a passion for

exceptional performance, the 3D Blaster Voodoo2

delivers more than three times the speed found in

equivalent Voodoo Graphics cards.

64-15-0212 **£72** £84.60 inc. VAT



### Diamond Viper V550

Viper V550 is the next generation high-performance mainstream graphics accelerator. Based on the RIVA TNT from nVidia it offers again unbelievable performance levels in true 128-bit for 2D & 3D graphics. Optimized for DirectX 6.0 and Windows 98 the usage ranges from 3D action gaming to home/business applications to basic CAD/CAM programs

64-19-0552 V550 PCI **£99** £116.33 inc. VAT

64-19-0554 V550 AGP **£95** £111.63 inc. VAT



### Diamond Monster Fusion

Now, for the first time, Monster Fusion offers proven and appreciated Voodoo quality in both 2D and 3D with the Voodoo Banshee from 3Dfx. By supporting all major APIs like DirectX(tm), Glide(tm) and OpenGL(tm), it offers maximum flexibility with one board. With up to 16 MB RAM and a 250-MHz RAMDAC, Monster Fusion delivers state-of-the-art graphics acceleration as well as high resolutions and refresh rates. It's the best solution for anyone who needs one board for both leisure and productivity.

64-19-0702 (PCI) **£76** £89.30 inc. VAT

64-19-0704 (AGP) **£76** £89.30 inc. VAT

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THE BEST YOU'LL GET

**GRAPHICS & TV CARDS**



ex VAT inc VAT

**3D Graphics Cards - PCI**

**OEM packs**

64-97-0302	Charger - 2Mb	£17	£19.98
64-97-0304	Charger - 4Mb	£19	£22.33
64-97-0604	XPERT @ Play - TV Out, 4Mb	£42	£49.35
64-97-0608	XPERT @ Play - TV Out, 8Mb	£52	£61.10
64-97-0504	XPERT @ Work - 4Mb	£29	£34.08
64-97-0508	XPERT @ Work - 8Mb	£39	£45.83
64-97-0704	All-in-Wonder Pro - 4Mb	£65	£76.38
64-97-0708	All-in-Wonder Pro - 8Mb	£89	£104.58
64-97-1408	TVTUNER - fits all cards	£45	£52.88

**Retail packs with 3D software titles**

64-97-1604	XPERT @ Play TV Out, 4Mb	£63	£74.03
64-97-1608	XPERT @ Play TV Out, 8Mb	£80	£94.00
64-97-1504	XPERT @ Work - 4Mb	£56	£65.80
64-97-1508	XPERT @ Work - 8Mb	£72	£84.60
64-97-1714	All-in-Wonder Pro - 4Mb	£99	£116.33
64-97-1718	All-in-Wonder Pro - 8Mb	£109	£128.08

**3D Graphics Cards - AGP**

**OEM packs**

64-97-0614	XPERT @ Play - TV Out, 4Mb	£49	£57.58
64-97-0618	XPERT @ Play - TV Out, 8Mb	£49	£57.58
64-97-0514	XPERT @ Work - 4Mb	£29	£34.08
64-97-0518	XPERT @ Work - 8Mb	£39	£45.83
64-97-9808	XPERT 98 - 8Mb	£35	£41.13
64-97-0714	All-in-Wonder Pro - 4Mb	£65	£76.38
64-97-0718	All-in-Wonder Pro - 8Mb	£89	£104.58

**Retail packs with 3D software titles**

64-97-9818	XPERT 98 - 8Mb	£42	£49.35
64-97-1704	All-in-Wonder Pro - 4Mb	£99	£116.33
64-97-1708	All-in-Wonder Pro - 8Mb	£109	£128.08
64-97-9850	XPERT 128 - 16Mb AGP	£79	£92.83
64-97-9900	RAGE FURY 128 - 32Mb AGP	£136	£159.80
19-97-0400	Extra 4Mb SGRAM (all 4Mb cards)	£23	£27.03



ex VAT inc VAT

**Express 3D**

64-31-0204	4Mb AGP	£44	£51.70
64-31-0208	8Mb AGP	£44	£51.70



**DVD Player**

64-97-0290	DVD player - PCI, MPEG playback card	£89	£104.58
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**Grafixstar**

64-97-1411	410 - S3 Trio64V2, 1Mb EDO DRAM	£19	£22.33
64-97-0261	600 Pro PCI - 2Mb	£46	£54.05

**Apocalypse**

64-97-0287	3Dx - 4MB SDRAM PCI Value Pack	£34	£39.95
64-97-0213	Retail Pack	£49	£57.58



A new generation of graphics cards from the leading manufacturer.

64-19-3000	3D Explorer 3000 4MB AGP Riva 128 chipset	£49	£57.58
64-19-3216	V3200 Banshee 16MB AGP 3DFX Banshee chipset	£63	£74.03
64-19-3416	V3400 TNT 16MB AGP Riva TNT with TV-Out	£82	£96.35

**INTERNET VIDEO**



ex VAT inc VAT

64-15-0162	WebCam 2 Requires Windows 95	£55	£64.63
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63-31-1000	Create & Share PCI With PCI capture card	£109	£128.08
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63-31-1500	Create & Share USB With USB connector. Requires Windows98/95OSR2	£72	£84.60
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63-91-0300	Pace PCI With PCI capture card	£65	£76.38
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63-91-0100	Pace USB With USB connector. Requires Windows98/95OSR2	£65	£76.38
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**LIVE VIDEO OVER THE INTERNET**

**Creative Labs Video Blaster WebCam**

gives you everything you need to capture, create and communicate with live full colour video on the internet. It's capable of live video capture with 16.7million colours, and supports AVI and e-mail.



Affordable and easy-to-use, it plugs into your printer port and works with your existing modem so you'll be up and running with live video from your own PC in minutes.

Now You See It.



**XPERT 128**

- 128-bit 3D graphics performance
- Brilliant 2D graphics
- Full-frame, full-screen MPEG-2/DVD playback without the need for additional hardware
- Full support for Direct 3D and OpenGL for all your favourite graphics intensive 3D games and applications
- 16MB of memory
- Support for ATI-TV, the add-on TV Tuner board



**XPERT 128** 64-97-9850  
**£75** £88.13 inc.VAT

**RAGE FURY**

- 32MB of memory for realistic gameplay with massive textures and high resolution
- Explosive 128-bit 3D gaming action!
- A new 128-bit graphics engine and 128-bit memory interface for incredibly fast 3D and 2D graphics performance
- Full OpenGL ICD, Direct 3D and DirectX 6.0 support for all your favourite 3D applications and games
- Built-in hardware DVD for full-frame, full-screen DVD playback



**RAGE FURY** 64-97-9900  
**£136** £159.80 inc.VAT

**XPERT 98**

- Incredible 3D Acceleration
- Powerful 2D Graphics
- Full AGP 2X card
- Windows 98 ready
- Full support for ATI-TV, the add-on TV Tuner card



**XPERT 98** 64-97-9818  
**£42** £49.35 inc.VAT

**All-In-Wonder Pro**

- Incredible 3D Acceleration
- Powerful 2D Graphics
- Advanced TV Tuner Functionality
- Bring video into your PC
- Connect TV to All-In-Wonder Pro
- Amazing video quality
- Full AGP 2X version available



**All-in-Wonder Pro**  
64-97-0714 4MB from **£65** £76.38 inc.VAT  
64-97-0718 8MB from **£89** £104.58 inc.VAT

**BEST VALUE 8MB 3D/2D VIDEO ACCELERATOR**

**THE ULTIMATE TV, VIDEO AND GRAPHICS MULTIMEDIA UPGRADE !**

**GRAPHICS CARDS & INTERNET VIDEO**

For SMC's unique guarantee : see page 2

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ALL MAJOR CREDIT CARDS ACCEPTED

**25**



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

## A quick guide to Monitor sizes

14" - Ideal for business workstation use (eg word processing, database, spreadsheet) and basic games.

15" - Better for applications involving more graphics such as Internet use and higher resolution games.

17" - Primarily graphics use such as 3D modelling.

21" - Intensive graphics use, including CAD and Desktop Publishing (Including the production of this catalogue !)

Monitor screen sizes are traditionally specified in terms of the size of the glass Cathode Ray Tube (CRT), but viewable screen sizes will vary depending on how much of the CRT extends beyond the monitor casing.

LCD screen sizes are usually quoted as the actual visible size.

# MONITORS



iiyama have over 20 years experience in manufacturing monitors in Japan and across the world. Since the UK office has been established they have won 44 leading computer magazine awards for technical excellence, display quality and value for money - a unique achievement.

In turn, SMC have won iiyama's award to establish themselves as Premier Authorised Reseller for Service Excellence for the second successive year.

## IYYAMA MONITORS

All iiyama monitors now have a 3-year warranty, with the first year on-site.

Part No	Model	Size	Dot Pitch	Max. Res	ex VAT	inc VAT
68-93-9153	MF-8515G	15"	.28mm	1280x1024	£115	£135.13
68-93-4010	S-701GT	17"	.26mm	1600x1200	£259	£304.33
68-93-4011	S-702GT	17"	.28mm	1600x1200	£229	£269.08
68-93-9175	MF-8617ES [sp]	17"	.26mm	1280x1024	£349	£410.08
68-93-4016	A-701GT	17"	.25mm grille	1600x1200	£299	£351.33
68-93-1901	S-901GT	19"	.27mm	1600x1200	£399	£468.83
68-93-4020	A-901GT	19"	.25mm grille	1600x1200	£435	£511.13
Limited Offer - All 21" Monitors supplied by SMC come with 3 Year on-site included.						
68-93-5010	S-101GT	21"	.27mm	1600x1200	£645	£757.88
68-93-5016	A-101GT	21"	.28mm grille	1600x1200	£645	£757.88
68-93-5020	S-102GT	21"	.27mm	1800x1440	£669	£786.08
68-93-5026	A-102GT	21"	.28mm grille	1800x1440	£669	£786.08
<b>Resistive Touch Screen Monitors (for Windows 95) Experience the Power of Touch</b>						
68-93-1500	TS15	15" based on MF-8515G			£535	£628.63
68-93-1700	TS17	17" based on MF-8617T			£685	£804.88
68-93-2100	TS21	21" based on MT-9221T			£1185	£1392.38

### PROLITE - Flat panel screen

68-93-3601	ProLite 3601	14.1" Analogue LCD		1024x768	£575	£675.63
68-93-3602	ProLite 3602	14.1" Analogue LCD		1024x768	£765	£898.88
68-93-3811	ProLite 3811	15" Analogue LCD		1024x768	£765	£898.88
68-93-3821	ProLite 3821	15" Analogue LCD		1024x768	£795	£934.13

### IYYAMA VISION CARE (Extended Warranty Options)

68-93-9903	LCD ProLite 36				£29	£34.08
68-93-9916	15" MF-8515G				£15	£17.63
68-93-9917	17" MF-8617T/ES & MT-9017T				£25	£29.38
68-93-9919	19" S-901GT				£29	£34.08
68-93-9921	21" S-101GT, A-101GT, S-102GT, A-102GT				£35	£41.13

Warranties are upgradable 3 Year On-Site next day swap-out.

Only available at time of purchase of monitor. [sp] denotes integral speakers.

## COLOUR MONITORS & LCD

Model	Dot Pitch	Max. Res.	ex VAT	inc VAT
68-26-1440	LG Goldstar SW44i	.28mm	1024x768	£79 £92.83
68-26-5000	Philips 104B *	.28mm	1024x768	£75 £88.13
<b>15"</b>				
68-90-1507	AOC 5GLR	.28mm	1280x1024	£96 £112.80
68-26-1558	LG Goldstar SW57i	.28mm	1280x1024	£105 £123.38
68-26-5000	LG Goldstar 500LC	TFT LCD	1024x768	£639 £750.83
68-59-1505	Philips 105S *	.28mm	1024x768	£99 £116.33
68-59-1515	Philips 105MB [sp] [m]	.28mm	1280x1024	£135 £158.63
68-59-0155	Philips 151AX-TC095	TFT LCD	1024x768	£559 £656.83
68-71-1517	Sony CPD100ES	.25 Grille	1024x768	£149 £175.08
68-71-1519	Sony CPD100GST	.25 Grille	1280x1024	£199 £233.83
68-71-1201	Sony CPD120AS [sp]	.25 Grille	1280x1024	£239 £280.83
68-71-0150	Sony CPDL150	TFT LCD	1024x768	£899 £1056.33
<b>17"</b>				
68-90-1715	AOC 7GLR	.28mm	1280x1024	£169 £198.58
68-26-7700	LG Goldstar SW77TS	.28mm	1024x768	£175 £205.63
68-26-1783	LG Goldstar SW78M [sp]	.26mm	1600x1280	£229 £269.08
68-26-2770	LG Goldstar SW77M [sp]	.26mm	1600x1200	£219 £257.33
68-71-1721	Sony CPD200EST	.25mm	1024x768	£269 £316.08
68-71-1719	Sony CPD200GST	.25 Grille	1280x1024	£289 £339.58
Integrated mono speaker jack (for video conferencing & voice mail)				
68-71-1723	Sony GDM-200PST	.25 Grille	1280x1024	£372 £437.10
68-71-2201	Sony CPD220AS [sp]	.25 Grille	1280x1024	£319 £374.83
68-59-1713	Philips 107B [sp]	.28mm	1280x1024	£265 £311.38
Including CustoMax software and Built-in Stereo sound				
68-99-1117	ViewSonic VS-E771	.27mm	1280x1024	£179 £210.33
<b>19"</b>				
68-26-9901	LG Goldstar SW99T	.26mm	1600x1200	£349 £410.08
68-71-1940	Sony GDM400PST	.25 grille	1600x1200	£479 £562.83
68-59-1905	Philips 109MP	.26mm	1600x1200	£449 £527.58
<b>20"</b>				
68-71-2017	Sony CPD300SFT5	.30mm	1280x1024	£709 £833.08
<b>21"</b>				
68-59-2104	Philips 201B *	.27mm	1600x1200	£659 £774.33
68-59-2103	Philips 201BRC [sp] [m]	.26mm	1600x1200	£1145 £1345.38
68-26-2160	LG Goldstar SW2165C	.28mm	1600x1200	£589 £692.08
68-71-5200	Sony CPD520GST	.25mm	1600x1200	£689 £809.58
68-71-5210	Sony GDM-500PST	.25mm	1600x1200	£729 £856.58
68-71-5215	Sony F500	.22mm	1680x1440	£1180 £1386.50
68-99-5321	ViewSonic VS-PT813	.28mm	1600x1200	£659 £774.33
68-99-5815	ViewSonic VS-P815	.25mm	1800x1440	£739 £868.33

[sp] denotes integral speakers, [m] denotes microphone supplied



## LG STUDIOWORKS MONITORS

Nobody is further ahead in IT than LG. £1.5m is spent every day on R&D and £2bn is being invested in a manufacturing plant in Wales, ensuring LG Electronics' position as a leading player in a very exciting digital future.

### Seeing things more clearly

**500LC**  
15.1" (15.1" viewable) screen

- Brilliant active matrix TFT display
- Genesis chip allows full SVGA/VGA
- Wide viewing angle, 60° left and right
- Bright 200cd/m² display
- Multi-sync support up to 1024x768 @ 75Hz

68-26-5000 **£639** (£750.83)

**SW77TS**  
17" (15.8" viewable) screen

- Ultra contrast tube ensures greater levels of contrast and colour purity
- Flicker-free up to 1024x768 NI (non-interlaced) @ 85Hz
- 0.28mm Dot Pitch
- Digital controls with on-screen display

68-26-7700 **£175** (£205.63)

**SW2165C**  
21" (20" viewable) screen

- 30-95KHz FST
- Flicker-free 1600x1200 NI (non-interlaced) @ 75Hz
- Digital controls with on-screen display
- 0.28mm Dot Pitch with Double Focus Circuitry

68-26-2160 **£589** (£692.08)

**SW77M**  
17" (15.7" viewable) screen

- Integrated stereo amplifier with DOME stereo speakers
- Built in mic plus earphone jack
- Flicker-free up to 1024x768 NI (non-interlaced) @ 85Hz
- 0.28mm Dot Pitch

68-26-7770 **£219** (£257.33)

**SW7955C**  
17" (16" viewable) screen

- 100Hz ultra-high resolution model
- 0.26mm Dot Pitch
- Flicker-free at max resolution 1600x1200 @ 80Hz
- On-screen digital controls
- TC095 approved
- UK

68-26-7950 **£275** (£323.13)

**SW57i**  
15" (13.8" viewable) screen

- Multi-sync support from 640x480 up to 1280x1024 NI
- Flicker-free up to 1024x768 NI (non-interlaced) @ 85Hz
- 0.28mm Dot Pitch
- Digital controls with on-screen display
- Made in the UK

68-26-1558 **£105** (£123.38)

\*TCO '95 on all models except SW57i monitor.

All monitors come with a 3 year on-site, swap-out warranty.

Website <http://www.lge.co.uk>

**SALES FREEPHONES : South - 0800 597 5 333**

**Midlands - 0800 597 6 333**

**North - 0800 597 7 333**

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THE BEST YOU'LL GET

**FILM SCANNERS**

ex VAT Inc VAT

**EPSON**

The Epson FilmScan 200 is supplied with an interface card, cables and software. It is an external device that supports negative and positive scanning at 1200x2400 dpi, max 4800 dpi - 30 bit colour. There is an optional film (APS) holder.

97-93-0201 **Epson FilmScan 200**  
35mm film scanner, SCSI interface £184 £216.20

97-93-0235 **Advanced Photo System (APS) Holder**  
Film cartridge holder for batch scanning £75 £88.13



97-28-5107 **PhotoSmart Photo Scanner**  
35mm-5"x7" photo, 35mm negative or slide scanner £318 £373.65

**Shuttle Technology**

97-93-0100 **Shuttle Fingerprint Reader**  
Use your Fingerprint to log into Windows 95/98 & NT instead of having to enter a password. £79 £92.83

**Epson FilmScan 200**

97-93-0201 **£184** NOKEY Inc.VAT



If you'd like to create presentation documents, posters, newsletters, greetings cards - or simply lots of superb quality photoprints, enlarged just as you want them - the EPSON FilmScan 200 offers an easy and very affordable way to digitise your photos.

A truly versatile scanner, the FilmScan 200 accepts 35mm film strip (both positive and negative) and mounted slides, while the addition of an Advanced Photo System cartridge enables handling of the very latest film format. For added convenience, a batch-scanning facility enables up to 6 images to be scanned simultaneously.



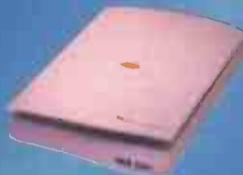
**Hewlett Packard ScanJet scanners**

Capture the excitement, enjoy the success!

No experience is necessary to easily scan photos, illustrations, logos or pages of text into your PC document, or turn an ordinary project into a work of art. Personalise correspondence with a family photo, or add a lively new dimension to everything from greeting cards to presentations, or even your own web site. HP's Intelligent Scanning Technology can automatically handle all the settings for you, or let you get hands-on for greater customisation. So if you've ever wished you could incorporate a favourite image into a letter or report, stop dreaming! With an HP scanner from SMC you can do it at the touch of a button.

**ScanJet 4100C**

97-28-6297 **£116** £136.30 Inc.VAT



The smart friend who makes it easy to add the exciting dimension of scanning to all your projects.

- Excellent Image Quality (600dpi HSS)
- Quick results with colour copy and scan buttons
- Dual Image Scan covers both text and graphics
- Automatic optimisation of text and graphics
- USB connection

**ScanJet 6200C**

97-28-6277 **£237** £278.48 Inc.VAT

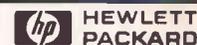


The versatile consultant for fast, high-quality scanning in the office with network capabilities for workgroup productivity.

- Superior Image Quality (1200dpi HSS)
- Intelligent Scaling for enhanced resolution
- HP PrecisionScan Pro for increased productivity
- Drag and drop scans into your application
- Choice of USB or SCSI II connection

**SCANNERS**

ex VAT Inc VAT



HP A4 scanners are all supplied with software & OCR

97-28-7167 **Scanjet 3200** £64 £75.20  
97-28-6297 **Scanjet 4100C - 600dpi HSS\***  
36-bit colour, USB/W98 only £116 £136.30  
97-28-7177 **Scanjet 4200** £117 £137.48

97-28-5100 **Scanjet 5100C - 1200/300dpi, 24-bit colour, Parallel Port interface with cable** £144 £169.20  
97-28-7197 **Scanjet 5200** £156 £183.30  
97-28-6277 **Scanjet 6200C - 1200dpi HSS\***  
36-bit colour, USB/W98 or SCSI £237 £278.48

97-28-6278 **Scanjet 6250C - 1200dpi HSS\***  
36-bit colour, USB/W98 or SCSI with document feeder £275 £323.13

\* HSS (Hardware Super Sampling) is a breakthrough technology that improves image quality in areas such as fine detail, enlargements over 400% and half-toned originals.

HP 3-year On-Site Support Packs

99-28-9464 **H5465A - Scanjet 5S, 5100C** £66 £77.55  
99-28-9470 **H5470A - Scanjet 6100C** £102 £119.85  
99-28-9464 **H5465A - Scanjet 4100, 6200, 6250C** £66 £77.55

**EPSON**

**GTX Range**

A4 scanners (Inc. Adobe Photoshop LE, Caere OmniPage LE OCR)

**Parallel Port interface** - supplied with Parallel cable  
97-93-0957 **GTX9500/P - 2400/600dpi, 36-bit colour** £368 £432.40

**SCSI interface** - with ISA SCSI controller card & cable  
97-93-0553 **GTX5500/S - 1600/400dpi, 30-bit colour** £125 £146.88  
97-93-0953 **GTX9500/S - 2400/600dpi, 36-bit colour** £389 £457.08

**GT9600**

A4 flatbed scanner with PCI SCSI card. 800/12800 dpi, 36-bit colour  
97-93-0962 **GT9600 (bare) SCSI card & cable** £409 £480.58  
97-93-0965 **GT9600 & SW SCSI card & PhotoShop LE, PageMill & TextBridge** £449 £527.58

**GT12000**

A3 scanners with ISA SCSI interface, supplied with PC/MAC drivers. 6400/800dpi, 36-bit colour  
97-93-0120 **GT12000 (bare)** £1315 £1545.13  
97-93-0124 **GT12000/Graphics**  
SCSI card & cables, transparency adaptor, Adobe Photoshop LE £1699 £1996.33  
97-93-0126 **GT12000/OCR**  
SCSI card & cables, document feeder, Caere OmniPage LEV5 £1999 £2348.83

**GT7000**

97-93-0700 **GT7000 - 2400/600dpi, 36-bit colour, SCSI card & cables, 1 touch scanner** £147 £172.73  
97-93-0720 **GT7000 Photo** £197 £231.48  
transparency adaptor

**UMAX**

Software supplied :- Adobe PhotoDeluxe, VistaScan, PageManager, PhotoAlbum LE, Caere OmniPage LE and Recognita OCR & are compatible with Win95 & Win98.

ex VAT Inc VAT

**Astra 1220 Series**

97-81-1200 **1220p Parallel Port** £84 £98.70  
97-81-1201 **1220s SCSI** £125 £146.88  
97-81-1205 **1220u USB** £99 £116.33



**1220 Series**

- A4 Flatbed Scanner
- 36 bit colour scanning
- 600 x 1200dpi optical resolution
- 9600 x 9600dpi maximum resolution
- Single Pass, colour CCD
- Bundled software
- Available with Parallel, SCSI or USB interface



**610 Series**

- A4 Flatbed Scanner
- 30 bit colour scanning
- 300 x 600dpi optical resolution
- 4800 x 4800dpi maximum resolution
- Single Pass, colour CCD
- Bundled software
- Available with Parallel or SCSI interface

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253-257 Farnham Rd Slough Berkshire SL2 1HA



ALL MAJOR CREDIT CARDS ACCEPTED

SCANNERS & FILM SCANNERS

For SMC's unique guarantee : see page 2



# LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

## Which printer to buy ?

A good place to start when selecting a printer is to apply the "3D test"

**DPI** : This is the number of dots per inch. 600dpi gives about the best quality : beware of higher densities which may be subject to image degradation through ink saturation.

**Dots** : the size and shape of the ink dots is just as important. Many people opt for HP's unique PhotoRET II process which produces smaller, rounder dots which are overlaid to produce the broadest range of colours possible.

**Delivery** : Consider the printer's speed of operation, measured in pages per minute (ppm). Remember that saving money by selecting a slower speed will be very frustrating if the printer is unable to keep up with the volume of work !

## INKJET PRINTERS

# INKJET PRINTERS

### Hewlett Packard

#### Deskjet Printers

	ex VAT	inc VAT
99-28-4562	695	£96 £112.80
99-28-6409	880	£164 £192.70
99-28-2642	420C	£66 £77.55
99-28-5890	690	£89 £104.58
99-28-5894	710C	£126 £148.05
99-28-5870	720C	£141 £165.68
99-28-2678	1120C	£285 £334.88
99-28-5160	1600C	£499 £586.33
99-28-5168	1600CM	
	Network & Postscript ready	£1280 £1504.00
99-28-4530	2000C	£450 £528.75
99-28-5901	2000CN	£675 £793.13
99-28-2684	1600C	£705 £828.38
99-28-2685	2500CM	
	Network ready	£892 £1048.10
99-28-5876	895CXI	£186 £218.55

#### Ink Cartridges

96-28-5030	HP51633M		
	310/320/340/DW310,320,340	£15	£17.63
96-28-5060	HP51629A		
	600/660C/690C/DW600,660C	£17	£19.98
96-28-5069	HP51649A		
	600/660C/690C/DW600,660C	£18	£21.15
96-28-1816	HPC1816A	£20	£23.50
96-28-5901	HP51625A	£19	£22.33
96-28-5080	HP51645A		
	820Cxi/850C/870Cxi/890C/1600C/CM	£18	£21.15
96-28-5089	HP51641A	£18	£21.15
96-28-5120	HP51640A	£16	£18.80
96-28-5123	HP51640C		
	1200C/1200C PS/1600C/1600CM	£19	£22.33
96-28-5125	HP51640M		
	1200C/1200C PS/1600C/1600CM	£19	£22.33
96-28-5127	HP51640Y		
	1200C/1200C PS/1600C/1600CM	£19	£22.33
96-28-1823	HPC1823A	£22	£25.85
96-28-4841	HPC4841A	£22	£25.85
96-28-4842	HPC4842A	£22	£25.85
96-28-4843	HPC4843A	£22	£25.85
96-28-4844	HPC4844A	£22	£25.85

#### HP 3-year On-Site Support Packs

99-28-9461	H5461A	£35	£41.13
99-28-9464	H5465A	£66	£77.55
99-28-9473	H5473A	£105	£123.38
99-28-9475	H5475A	£140	£164.50

### Canon

#### Printers

	ex VAT	inc VAT
99-91-5030	BJ30 (cream)	£129 £151.58
99-91-5050	BJC50	£192 £225.60
99-91-5080	BJC80	£142 £166.85
99-91-5280	BJC80 + Scanner	
	720x360dpi, 3ppm	£185 £217.38
99-91-5250	BJC250	£73 £85.78
99-91-6430	BJC4300	£89 £104.58
99-91-6465	BJC4650	£194 £227.95
99-91-6469	BJC4650 + Scanner	
	720x360dpi, 4.8ppm, A3	£235 £276.13
99-91-5000	BJC5000	£175 £205.63
99-91-6550	BJC5500	£409 £480.58
99-91-6700	BJC7000	
	1200dpi x 600dpi, 4.5ppm, max 550gsm	£155 £182.13

#### Ink Cartridges

96-91-5000	BC22	£19	£22.33
96-91-5010	BC01	£12	£14.10
96-91-5020	BC02	£14	£16.45
96-91-5023	BC09F	£16	£18.80
96-91-5026	BC06	£13	£15.28
96-91-5030	BC05	£14	£16.45
96-91-5040	BC10	£20	£23.50
96-91-5041	BC11E	£23	£27.03
96-91-5060	BC1201BKHC	£6	£7.05
96-91-5063	BC1201C	£6	£7.05
96-91-5065	BC1201M	£6	£7.05
96-91-5067	BC1201Y	£6	£7.05
96-91-5080	BC1643BK	£13	£15.28
96-91-5083	BC1643C	£17	£19.98
96-91-5085	BC1643M	£17	£19.98
96-91-5087	BC1643Y	£17	£19.98
96-91-5404	BC20	£19	£22.33
96-91-5405	BC29F	£23	£27.03
96-91-5410	BC21E	£26	£30.55

#### 96-91-5000 includes:

BC22 Kit, BC22 4 Colour Cartridge, MGI PhotoSuite V8, 24Exp Kodak film, 5 sheets High Quality Paper

£19 £22.33 inc.VAT

Limited stock available.

### Epson

#### Stylus Printers

99-93-5144	Color 440	£96	£112.80
99-93-5164	Color 640	£119	£139.83
99-93-5174	Color 740	£148	£173.90
99-93-5185	Color 850	£207	£243.23
99-93-5252	Color 1520		
	800cps LQ, A3	£451	£529.93
99-93-5191	Photo	£145	£170.38
99-93-0700	Photo 700	£140	£164.50
99-93-9045	Photo 750	£177	£207.98
99-93-5195	Photo EX		
	9mmp, A3	£308	£361.90
99-93-5300	Color 3000	£899	£1056.33
99-93-5500	Pro 5000	£1587	£1864.73

#### Ink Cartridges

96-93-8220	S020034	£9	£10.58
96-93-8229	S020036	£17	£19.98
96-93-8200	S020047	£13	£15.28
96-93-8209	S020049	£19	£22.33
96-93-8249	S020066	£18	£21.15
96-93-8009	S020089		
	Color 400/600/800/850/1520 Color	£16	£18.80
96-93-4000	S020093		
	Color 400/500/600/Photo Black	£14	£16.45
96-93-8000	S020108	£16	£18.80
96-93-8005	S020110	£12	£14.10
96-93-0118	S020118	£32	£37.60
96-93-0122	S020122	£32	£37.60
96-93-0126	S020126	£32	£37.60
96-93-0130	S020130	£32	£37.60
96-93-0138	S020138	£13	£15.28
96-93-0143	S020143	£32	£37.60
96-93-0147	S020147	£32	£37.60
96-93-0187	S020187	£16	£18.80
96-93-0189	S020189	£16	£18.80
96-93-0191	S020191	£19	£22.33

#### Epson cover Plus Support Packs

	3 Year on-site, with an 8-hour response time.		
99-93-0238	Group 2 - Stylus 300, 440, 640	£35	£41.13
99-93-0338	Group 3 - Stylus 740, Photo 700, EPL-5700, GT5500	£59	£69.33
99-93-0438	Group 4 - Photo EX, GTG500	£99	£116.33
99-93-0538	Group 5 - EPL-N1200, EPL-N1600	£175	£205.63
99-93-0638	Group 6 - EPL-N2000, Stylus 3000, GT12000	£275	£323.13
99-93-0738	Group 7 - Stylus Pro 5000	£399	£468.83



## Hewlett Packard InkJet printers

HP InkJet printers can enable you express your creativity in as many ways as you can imagine. You can be sure that whichever InkJet printer you choose, it will help you get the job done in style.

### DeskJet 420C

99-28-2642  
**£66**  
£77.55 inc.VAT



The affordable friend that makes a great first printer! Giving both colour and black & white printing, it is ready to handle correspondence and fun projects right out of the box.

The flexible partner that gives you great results with no hassle. Fast and quiet, the 710C also prints photos without changing cartridges.

### DeskJet 710C

99-28-5894  
**£126**  
£148.05 inc.VAT



### HP 2000C

99-28-4530  
**£450**  
£528.75 inc.VAT

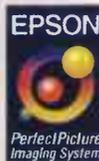


The professional consultant that lets you get down to business with breakthrough colour printing speed. For network use, choose the CN option to get a print server and 350-sheet accessory paper\* tray added to the package.

### Epson Stylus Colour 640

99-93-5164  
**£119**

£139.83 inc.VAT



The EPSON Stylus COLOR 640 Inkjet printer utilises the very latest 4 colour inkjet technology to provide high definition 1440dpi printing and PhotoReal colour with maximum ease of use and exceptional value for money. EPSON's exclusive PerfectPicture Imaging System brings amazing results to the most demanding home applications.

Presentations, reports and newsletters can achieve new levels of professionalism, while family fun and photos will never be the same again.

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**THE BEST YOU'LL GET**

**LASER PRINTERS**

**Hewlett Packard**

	ex VAT	inc VAT
<b>A4 Printers</b>		
99-28-4170 2100 New model	£423	£497.03
99-28-4171 2100M New model	£480	£564.00
99-28-4172 2100TN New model	£600	£705.00
99-28-7620 1100 600dpi, 8ppm	£232	£272.60
99-28-4118 4000 1200dpi, 16ppm [PS]	£711	£835.43
99-28-4119 4000T 1200dpi, 16ppm [PS]	£807	£948.23
99-28-4120 4000N 1200dpi, 16ppm [N] [PS]	£941	£1105.68
99-28-4121 4000TN 1200dpi, 16ppm [N] [PS]	£1008	£1184.40
99-28-4084 4500 Colour 1200dpi, 16ppm	£1597	£1876.48
99-28-4089 4500N Colour 1200dpi, 16ppm [N] [PS]	£1875	£2203.13
99-28-4094 4500DN Colour 1200dpi, 16ppm Duplex [N]	£2422	£2845.85

**A3 Printers**

99-28-4110 5000 1200dpi, 16ppm [PS]	£929	£1091.58
99-28-4111 5000N 1200dpi, 16ppm [N] [PS]	£1334	£1567.45
99-28-4112 5000GN 1200dpi, 16ppm [N] [PS] 1GB H/Drive	£1649	£1937.58
99-28-4085 8000 1200dpi, 24ppm [PS]	£1477	£1735.48
99-28-4086 8000N 1200dpi, 24ppm [N] [PS]	£1642	£1929.35
99-28-4087 8000DN 1200dpi, 24ppm [N] [PS]	£1935	£2273.63
99-28-4214 Duplex (two-sided printing) 8100 1200dpi, 32ppm	£1687	£1982.23
99-28-4215 8100N 1200dpi, 32ppm [N]	£1875	£2203.13
99-28-4216 8100DN 1200dpi, 32ppm [N]	£2145	£2520.38
99-28-3983 Duplex (two-sided printing) 8500 Colour 1200dpi, 24ppm	£3862	£4537.85
99-28-3984 8500N Colour 1200dpi, 24ppm [N]	£4425	£5199.38

**Laser Toner**

96-28-7413 HP92274A - 4L/4P/4M/4MP	£39	£45.83
96-28-7313 HP92275A - 11P/11P/11P/11Pplus	£46	£54.05
96-28-7354 HP92291A - 11Si/4Si/4Si MX	£72	£84.60
96-28-7230 HP92295A - 11D/11D	£42	£49.35
96-28-7434 HP92298A - 4/4M/4+4M/5/5N/5M	£48	£56.40
96-28-7451 HPC3900A - 4V/4MV	£79	£92.83
96-28-7551 HPC3903A - 5P/5MP/6P/6MP	£44	£51.70
96-28-7515 HPC3906A - 5L/6L	£35	£41.13
96-28-4092 HPC4092A - 1100/1150-A	£35	£41.13
96-28-4127 HPC4127A - 4000	£52	£61.10
96-28-0412 HPC4127X - 4000 Long life	£75	£88.13
99-28-4129 HPC4129X - 5000, UltraPrecise	£85	£99.88
96-28-3909 HPC3909A - 8000	£92	£108.10

**HP 3-year On-Site Support Packs**

99-28-9476 H5476A - 5/6P, 5/6MP	£142	£166.85
99-28-9479 H5479A - 5, 5M, 5N, 4000 Series	£180	£211.50
99-28-9482 H5482A - 4V, 4MV	£235	£276.13
99-28-9492 H5492A - 5Si MX/NX	£530	£622.75
99-28-9500 H5500A - 5L, 6L	£67	£78.73
99-28-9501 H5501A - 5/5M Colour	£619	£727.33
99-28-9499 H5499A - 8000 Series	£731	£858.93

**Canon**

	ex VAT	inc VAT
<b>Printers</b>		
99-91-7173 LBP1260+ - 600dpi, 12ppm	£614	£721.45
99-91-1760 LBP1760 - 600dpi, 17ppm	£655	£769.63

**Laser Toner**

96-91-5500 EP-E - LBP1260+	£49	£57.58
96-91-5552 EP-52 - LBP1760	£77	£90.48

**Epson**

	ex VAT	inc VAT
<b>Printers</b>		
99-93-7570 EPL5700 - 600dpi, 8ppm	£304	£357.20
99-93-7120 EPL-N1200 - 600dpi, 12ppm	£477	£560.48
99-93-7200 EPL-N2000 - 600dpi, 20ppm A4, 11ppm A3	£954	£1120.95
99-93-7201 EPL-2000PS - 600dpi, 20ppm	£1193	£1401.78
99-93-7160 EPLN-1600 - 600dpi, 16ppm	£594	£697.95
99-93-7163 EPLN-1600T - 600dpi, 16ppm	£716	£841.30
99-93-7165 EPLN-1600ENT - 600dpi, 16ppm [N]	£835	£981.13

99-93-8000 EPLNC-8000EN - 600dpi, 16ppm colour printer A3 [N]	£3979	£4675.33
99-93-8020 EPLNC-8000ENT - 600dpi, 16ppm colour printer A3 [N]	£4399	£5168.83

**Laser Toner**

96-93-1016 S051016 - 5600/N1200 toner/drum	£65	£76.38
96-93-1035 S051035 - N2000 Series toner/drum	£109	£128.08

**Brother**

	ex VAT	inc VAT
<b>Printers</b>		
99-90-0082 HL820 - 600dpi, 8ppm	£159	£186.83
99-90-0104 HL1040 - 600dpi, 10ppm	£199	£233.83
99-90-0105 HL1050/4 - 600dpi, 10ppm, 4MB	£239	£280.83
99-90-0107 HL1070/4 - 1200dpi, 10ppm, 4MB	£275	£323.13

**Laser Toner**

96-90-1953 BR1953 - HL820/1040, 1050, 1070	£13	£15.28
96-90-0126 BREP/ED - HL1260	£69	£81.08
96-90-0067 BR7833 - HL630/660	£19	£22.33

**OKI**

	ex VAT	inc VAT
<b>Printers</b>		
99-93-9601 OL6E - 600dpi, 6ppm	£189	£222.08
99-93-9108 OL8P - 600x1200dpi, 8ppm	£184	£216.20
99-93-9112 OL1211N - 600x1200dpi, 12ppm [N]	£409	£480.58
99-93-9101 OL101 - 600x1200dpi, 10ppm	£359	£421.83
99-93-9105 OL10EX - 600x1200dpi, 10ppm	£235	£276.13
99-93-9201 OL20N - 600x1200dpi, 20ppm	£729	£856.58
99-93-9205 OL20N/PS - 600x1200dpi, 20ppm, postscript	£899	£1056.33

**Laser Toner**

96-93-5136 OKI5136 - OL20,20N/PS	£23	£27.03
96-93-5122 OKI5122 - OL10	£14	£16.45
96-93-4851 OKI4851 - OL6,6EX	£14	£16.45

[N] - Network ready [PS] - Postscript Level II

**HP ALL-IN-ONE**

	ex VAT	inc VAT
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99-28-5317 <b>OfficeJet 635</b>		
Colour Inkjet Printer/Copier/Scanner		
300dpi optical 24bit colour scanning mono fax	£296	£347.80

97-28-6660 <b>OfficeJet 700</b>		
OfficeJet 700 colour printer/copier /scanner, PC assisted colour Fax		
300dpi optical scanning		

99-28-5368 <b>OfficeJet Pro 1170C</b>		
Colour Inkjet Printer/Copier/Scanner		
600dpi optical 24bit colour scanning	£489	£574.58

99-28-5369 <b>OfficeJet Pro 1175C</b>		
Colour Inkjet Printer/Copier/Scanner		
600dpi optical 24bit colour scanning fax-software (NOTE : fax required in PC)		
50-sheet document feeder	£614	£721.45

99-28-3948 <b>Laserjet 3100</b>		
Mono Laser Printer/Fax/Copier/Scanner		
600dpi, scan with 256 grey-scales	£489	£574.58

99-28-7625 <b>Laserjet 1100A</b>		
Mono Laser Printer/Copier/Scanner		
600dpi	£285	£334.88

	ex VAT	inc VAT
<b>Colour Digital Fax</b>		
Digital senders. Enter a new age where, with a simple network connection you can send full colour images to anyone on the network or to an email address.		

97-28-1313 HP Digital sender 10 BASE-T	£1793	£2106.78
97-28-1314 HP Digital sender 10 BASE-T/10 BASE-2	£1890	£2220.75
97-28-1316 HP Digital sender 10/100 BASE-T	£1890	£2220.75

**PRINTER CABLES**

With the increasingly demanding two-way data communication requirements of modern PCs, it is ever-more apparent that a low-quality cable can often compromise the level of performance achieved.

SMC stock premium quality bi-directional printer cables ensuring the highest performance from your printer or parallel port device. Cables use the standard 25-pin D-connector to 36-pin Centronics and are available in three lengths to suit a wide variety of installations.

	ex VAT	inc VAT
75-95-6002 1.8 metres	£5	£5.88
75-95-6003 3.0 metres	£7	£8.23
75-95-6005 5.0 metres	£9	£10.58



**LaserJet 5000**

HP LaserJet 5000 Series printers incorporate HP's most innovative new technologies, and are ideal for office, finance, CAD, desktop publishing, marketing... any workgroup that requires fast, high-quality monochrome printouts. Don't forget, too, that every printer comes with one feature you can't get anywhere else - HP's unrivalled reputation for quality, reliability & compatibility.

99-28-4110

**£929**

£1091.58 inc.VAT

**DOT MATRIX PRINTERS**

**Epson**

	ex VAT	inc VAT
99-93-0131 LK300 - 80 columns, 9 pin, 264cps, 4Kb Buffer	£97	£113.98
99-93-0880 FX880 - 80 columns, 9 pin, 455cps, 32Kb Buffer	£247	£290.23
99-93-0118 FX1180 - 136 columns, 9 pin, 455cps	£307	£360.73
99-93-4023 FX2180 - 136 columns, 18 pin, 506cps	£395	£464.13
99-93-0311 LQ300 - 80 columns, 24 pin, 240cps, 8Kb Buffer	£115	£135.13
99-93-0313 LQ570+ - 80 columns, 24 pin, 269cps, 8Kb Buffer	£216	£253.80
99-93-0315 LQ870 - 80 columns, 24 pin, 330cps, 8Kb Buffer	£377	£442.98
99-93-0322 LQ2070 - 136 columns, 24 pin, 330cps, 64Kb Buffer	£330	£387.75
99-93-0320 LQ2170 - 136 columns, 24 pin, 440cps, 64Kb Buffer	£459	£539.33

**Panasonic**

99-57-1150 KXP1150 - 80 columns, 9 pin, 240cps, 4Kb Buffer	£87	£102.23
99-57-2023 KXP2023 - 80 columns, 24 pin, 192cps, 14Kb Buffer	£109	£128.08
99-57-3626 KXP3626 - 136 columns, 24 pin, 300cps, 40Kb Buffer	£254	£298.45



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**HP's integrated All-in-Ones : a variety of tools at the touch of a button.**

When you have to make the most of your space, time and budget, an HP All-in-One product is the ideal solution. There are options that include either sharp black and white laser printing or excellent colour Inkjet printing, plus copying, scanning and faxing in one easy-to-use device. HP's All-in-One products are ideal for your small business or home office, and they fit right in if your family has a variety of printing and other imaging needs for work and school.

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**29**



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## LATEST PRODUCTS - LOWEST PRICES - TOTAL QUALITY !

It's a fact of life in the IT world that as time goes on, technology gets more complex, and while it is directed at achieving ever-greater levels of performance, great attention is given by manufacturers to making products user-friendly. While the business of setting up and/or reconfiguring networking software is most definitely left to specialist engineers (it's much better to shout at them for getting it wrong than wonder how on earth you're going to sort out a problem that defies obvious logic) the specification of hardware is becoming easier all the time. At SMC, we provide a range from single interface cards, cables, hubs and switches right through to networking kits and network-ready CD Towers. We are approved reseller partners with both 3Com and Intel, so give us a call for a response you can rely on.

# NETWORKING PRODUCTS



3Com is the world's leading supplier of network interface cards, and 3Com's exclusive Parallel Tasking technology ramps up your network's performance while driving down its costs.

3Com's leadership ensures leading-edge technology, extensive compatibility and seamless integration with both computer and network operating systems.



## NETWORK CABLES & CONNECTORS

### BNC / Thin Ethernet

ex VAT inc VAT

86-95-1371	Thin Ethernet cable, made to order: per metre :	£1	£1.18
86-95-1311	BNC solderless crimp connectors	£3	£3.53
86-95-1353	BNC Ethernet terminator	£5	£5.88
86-95-1331	BNC 'T' piece	£6	£7.05
86-95-1302	2m BNC Thin Ethernet cable with crimps - ready made	£4	£4.70
86-95-1305	5m BNC Thin Ethernet cable with crimps - ready made	£7	£8.23
86-95-1310	10m BNC Thin Ethernet cable with crimps - ready made	£10	£11.75
86-95-1320	20m BNC Thin Ethernet cable with crimps - ready made	£18	£21.15
86-95-1330	30m BNC Thin Ethernet cable with crimps - ready made	£24	£28.20

### RJ45 / Twisted Pair

86-95-4502	2m RJ45 Ethernet/Fast Ethernet cable - ready made	£3	£3.53
86-95-4503	3m RJ45 Ethernet/Fast Ethernet cable - ready made	£4	£4.70
86-95-4505	5m RJ45 Ethernet/Fast Ethernet cable - ready made	£6	£7.05
86-95-4510	10m RJ45 Ethernet/Fast Ethernet cable - ready made	£9	£10.58
86-95-4520	20m RJ45 Ethernet/Fast Ethernet cable - ready made	£15	£17.63
86-95-4530	30m RJ45 Ethernet/Fast Ethernet cable - ready made	£22	£25.85
86-95-4550	50m RJ45 Ethernet/Fast Ethernet cable - ready made	£35	£41.13
<b>Crossover Cables (no hub required) - for peer-to-peer networking : 2 machines only</b>			
86-95-0202	2m RJ45 Ethernet/Fast Ethernet Crossover cable	£18	£21.15
86-95-0210	10m RJ45 Ethernet/Fast Ethernet Crossover cable	£24	£28.20
86-95-0230	30m RJ45 Ethernet/Fast Ethernet Crossover cable	£28	£32.90

## PRODUCT LINK

**CD ROM Servers : See Page 19**

## 3COM NETWORKING

ex VAT inc VAT

### Network Interface Cards (NIC's)

<b>ISA (Etherlink III)</b>			
84-90-0931	3C509B-TP AUI/RJ45	£59	£69.33
84-90-0933	3C509B-TP AUI/RJ45 - 5pack	£256	£300.80
84-90-0935	3C509B-TP AUI/RJ45 - 20pack	£929	£1091.58
84-90-0951	3C509B-Combo BNC/AUI/RJ45	£69	£81.08
84-90-0953	3C509B-Combo BNC/AUI/RJ45 - 5pack	£299	£351.33
84-90-0955	3C509B-Combo BNC/AUI/RJ45 - 20pack	£1125	£1321.88
<b>PCI - 10Mb/s (Fast Etherlink XL)</b>			
84-90-1900	3C900B-TPO RJ45	£33	£38.78
84-90-5900	3C900B-TPO RJ45 - 5pack	£145	£170.38
84-90-2900	3C900B-TPO RJ45 - 20pack	£549	£645.08
84-90-9951	3C900B-Combo BNC/AUI/RJ45	£75	£88.13
84-90-9953	3C900B-Combo BNC/AUI/RJ45 - 5pack	£329	£386.58
<b>PCI - 100Mb/s (Fast Etherlink XL)</b>			
84-90-1905	3C905-TX UTP	£54	£63.45
84-90-5905	3C905-TX UTP - 5pack	£239	£280.83
84-90-2905	3C905-TX UTP - 20pack	£859	£1009.33
<b>EISA (Etherlink III)</b>			
84-90-9251	3C592-Combo BNC/AUI/RJ45	£125	£146.88
<b>MCA (Fast Etherlink III)</b>			
84-90-2931	3C529-TP BNC/AUI/RJ45	£125	£146.88
<b>PCMCIA - 10Mb/s (Fast Etherlink III)</b>			
84-90-1589	3C589D-TP RJ45	£76	£89.30
84-90-5589	3C589D-TP RJ45 - 5pack	£355	£417.13
84-90-2589	3C589D-TP RJ45 - 20pack	£1329	£1561.58
<b>PCMCIA - 10/100Mb/s (Fast Etherlink III)</b>			
84-90-1574	3C574-TX 16-bit UTP	£88	£103.40
84-90-5574	3C574-TX 16-bit UTP - 5pack	£399	£468.83
84-90-2574	3C574-TX 16-bit UTP - 20pack	£1588	£1865.90
84-90-3575	3CCFE575BT 32-bit UTP	£89	£104.58
84-90-3576	3CCFE575BT 32-bit UTP - 5pack	£422	£495.85
84-90-3577	3CCFE575BT 32-bit UTP - 20pack	£1599	£1878.83
<b>PCMCIA (Fast Etherlink XL)</b>			
Combined 56Kbps Modem+10Mb/s Lan Adapter			
84-90-0556	3CXEM556BT RJ45	£159	£186.83

### OfficeConnect Hubs/Switches/Kits

All OfficeConnect Hubs & Switches are supplied with a user-guide, power adapter, stacking clips and rubber feet as standard.

<b>10Mb/s Stackable Hubs</b>			
84-90-1674	3C16704 4 Port TP4, 4x RJ45	£33	£38.78
84-90-1673	3C16703 4 Port TP4 Combo, 4xRJ45/1xAUI/BNC	£45	£52.88
84-90-1670	3C16700 8 Port BTPO, 8x RJ45	£47	£55.23
84-90-1671	3C16701 8 Port BTPC, 8x RJ45/1x BNC	£59	£69.33
84-90-1672	3C16702 16 Port TPC16C, 16x RJ45/1x BNC	£99	£116.33
<b>100Mb/s Stackable Hubs</b>			
84-90-6723	3C16723 4 Port TP400, 4x UTP	£65	£76.38
84-90-6722	3C16722 8 Port TP800, 8x UTP	£112	£131.60
84-90-6721	3C16721 12 Port TP1200, 12x UTP	£199	£233.83
<b>10/100Mb/s Dual Speed Hubs</b>			
84-90-1675	3C16750 8x UTP	£189	£222.08
<b>Networking Kits</b>			
84-90-0308	3C50902B 3 x ISA 10Mb/s cards, 1 x 8 Port Hub, 3 x 50ft RJ45 Cables	£119	£139.83

### Superstack II Hubs/Switches

<b>12 Port</b>			
84-90-6112	3C16405 PS Hub 40 TP(12x10)	£205	£240.88
84-90-0252	3C250C-TX Hub 100 TX (12x100)	£475	£558.13
84-90-6312	3C16942A Switch 3000 (12x10/100)	£829	£974.08
84-90-1695	3C16951 Switch 1100 (2x10/100, 12x10)	£469	£551.08
84-90-6981	3C16981 Switch 3300 (12x10/100)	£1049	£1232.58
<b>24 Port</b>			
84-90-6524	3C16406 PS Hub 40 TP (24x10)	£369	£433.58
84-90-6824	3C16450 PS Hub 50 TP (24x10)	£565	£663.88
84-90-6980	3C16980 Switch 3300 (24x10/100)	£1569	£1843.58
84-90-1661	3C16611 DS Hub 500 (24x100) manageable	£669	£786.08
84-90-6950	3C16950 Switch 1100 (2x10/100, 24x10)	£789	£927.08
84-90-1659	3C16593 DS Hub (24x10/100) unmanaged	£619	£727.33

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# MODEMS



### 56k Message modem

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#### With Independent Messaging Facilities

Integrates x2 and V.90 Technology allowing users to download from the Internet and other x2/V.90 hosts at speeds up to 56Kbps\*. Its Independent Voice Messaging facility stores incoming fax and voice messages - even when your computer is switched off. The 2Mb chip can store approx. 25 faxes or approx. 35 voice messages of about 20 seconds in length, and voice messages can be retrieved through a dial-up connection. Integrated Flash memory offers capability for future features and enhancements.

\*Due to varying line conditions, the download speeds you experience may be lower.

### US Robotics 56K\* Winmodem Internal

Designed exclusively for the WindowsTMoperating environment, the US Robotics Winmodem utilizes the processing capabilities of your own computer and the functionality of Windows to provide a complete communications device for the home or office. It features X2 and upgradeable to V.90 ITU 56K standard. The Winmodem is WindowsTM 95 Plug & Play and automatically detects and configures the modem during installation. The Winmodem also features personal voice messaging, call discrimination, remote voice and message retrieval, and full duplex speakerphone for hands-free telephone conversations\*. Free internet/on-line trial software are included to enable the user to be surfing the web in minutes.

91-79-5601

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\* To utilise all voice features an external speaker, headset or soundcard is required.

### US Robotics Courier-I Modem

91-79-4906

**£229**

£269.08 inc.VAT



#### BENEFITS :

- > Super-fast connection speeds
- > Flash Upgradable
- > Analogue compatible (through ISDN line)
- > Plug & Play support

The Courier-I modem has the flexibility of both high-speed analogue and ISDN connectivity in one single desktop product. Speeds of up to 128K/sec are obtainable using ISDN. Even using analogue via an ISDN line, speeds of up to 56Kb/sec can be achieved by using X2 and V90 Technology. This versatility enables the Courier-I modem to fulfil a variety of functions with high-speed connections.

## MODEMS : PACE

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91-91-5666	56k Voice Modem : External (56k Flex technology)	£83	£97.53
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91-91-5670	Solo 56k Voice Modem using K56 Flex Message Management & Answerphone	£139	£163.33

## MODEMS : 3COM/US ROBOTICS

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### 56K Range

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#### Internal

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91-79-3356	<b>56K Winmodem</b> PC card, 56K Data Speed, 14,400bps Fax Speed uses standard PCMCIA Type II /III slot, inc. software. Requires Windows '95	£69	£81.08
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### COURIER Range

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#### ISDN

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91-79-4902	Courier-I Internal	£229	£269.08
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#### PCMCIA

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84-92-0560	PCMCIA V90 & K56 flex fax modem	£83	£97.53
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## MODEMS : BT

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### Prologue K56EV+

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### Prologue x3

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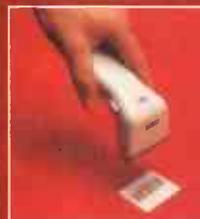
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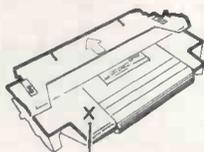
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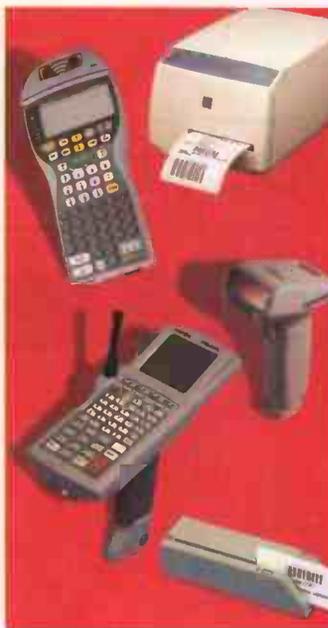


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Readers are reminded that the opinions expressed, and the results published in connection with reviews and/or laboratory test reports carried out on computing systems and/or related items are confined to, and are representative of, only those goods as supplied and *should not be construed as a recommendation to purchase*. Whilst every precaution is taken to ensure that reliability and good business practices prevail, the Publisher cannot be held responsible for the overall trading activities of any supplier referred to, or advertising within, this publication.

## DESKTOP PCs

**D**ue to the fast moving nature of the PC industry, we can only recommend particular PCs in the month we have seen them. Prices change almost weekly as component prices from third-party suppliers fluctuate according to availability. So, for this month's best PC buy, for instance, look at the group test on p148. When buying a PC there are a few basic steps you should take: always buy with a credit card; ask for a complete specification and the final price to be sent to you before you confirm the order; ask for a definite delivery date; keep a copy of all correspondence and remember to use the PCW order form (pXXX). Also take into account what kind of warranty you will need and consider spending more for an extended or improved warranty with on-site or speedy maintenance if you depend on your PC for your work. Obviously, everyone's ideal PC will have a different mix of components, with gamers needing a very good 3D graphics card, probably a 3D sound card and excellent speakers, and business users will need a good monitor and plenty of RAM.

## ENTRY-LEVEL PCs

Budget-conscious buyers might consider going for a non-Intel processor, such as an AMD. However, be aware that if you choose a Socket 7 chip you might find it hard to upgrade in future. Similarly, if you go for a Slot 1 processor, make sure you specify a motherboard with a BX chipset which will allow for greater upgrading options in the future. We would recommend the following specification:

- AMD K6-2 350 or Intel Celeron 366 processor
- 32Mb RAM
- 4Gb hard drive
- Graphics card with 4Mb video RAM
- 15in monitor
- CD-ROM drive

You can expect to pay between £499 and £699 (ex VAT) for this configuration, with either a sound card and speakers or a modem.

## MID-RANGE PCs

In the mid-range, around £1,000 (ex VAT) will get you a good all-round machine. As the PII 333 disappears, and with even PII 350s becoming scarce, it might be as well to look for a faster processor. Look for a minimum of:

- Intel PII or AMD K6-2 400MHz processor
- 64Mb RAM
- 8Gb hard disk
- Good 3D graphics card with 8Mb video RAM
- 17in monitor
- CD-ROM drive
- Sound card, speakers, 56K modem

Most of all, look for a machine that is easy to upgrade, so specify plenty of slots and no on-board chips on a good motherboard, and lots of free bays in the case.

## HIGH-END PCs

If you are after a state-of-the-art machine, be prepared to spend around £2,000 (ex VAT). What you require at this price will be specific to your needs, depending on how you intend to use the machine. However, as a basic specification we would want:

- PIII 500
- 128Mb 100MHz RAM
- 16Gb hard drive
- Good 3D graphics card with 12Mb video RAM
- 19in monitor
- DVD drive
- Sound card, speakers, 56K modem
- Bundled office suite

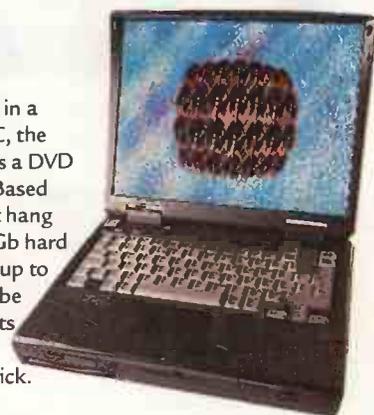
For the low-down on Intel's latest processor, the Pentium III, see page 122, this issue.

## HIGH-END NOTEBOOK

### Compaq Armada 7800

With everything you could need in a replacement to your desktop PC, the Armada 7800 even incorporates a DVD drive for movies-on-the-move. Based around a 300MHz PII it doesn't hang around and benefits from an 8Gb hard drive and 64Mb memory. With up to five hours' battery life it should be able to keep going longer than its users, and the power adapter is integrated — goodbye power brick.

► PCW March '99, p79



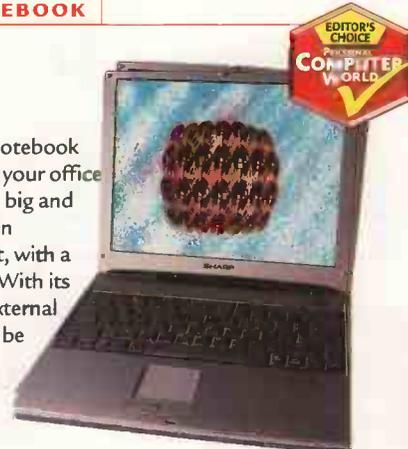
Price £3878.68 Contact Compaq 0181 332 3000  
Also Recommended Panasonic Toughbook CF-71 Price £2701.32 Contact Panasonic 0800 444220 • IBM ThinkPad 770 Price £3795.25 Contact IBM 0870 601 0136 (both PCW March '99)

## MID-RANGE NOTEBOOK

### Sharp PC-A150

Light and portable, this notebook has enough power to run your office apps, and a screen that is big and good enough to be used in presentations. It is robust, with a magnesium alloy casing. With its excellent keyboard and external floppy drive it could even be used as a desktop replacement.

► PCW March '99, p183



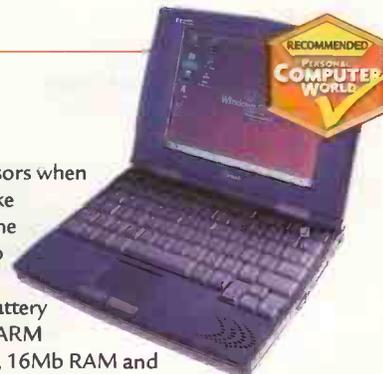
Price £2,109.13 Contact Sharp 0800 262958  
Also Recommended AJP 1100M Price £1,350.08 Contact AJP 0181 208 9744 • Sony Vaio 505 Price £2301.83 Contact Sony 0870 2402408 (both PCW March '99)

## PDA

### Hewlett-Packard Jornada 820e

Fed up with ever-faster processors when all you need is a machine to take notes and check your email? The Jornada could be the answer to your prayers. You can work for a full day without fear of the battery dying and with an Intel StrongARM processor running at 190MHz, 16Mb RAM and an integrated 56K modem, it has everything you need when on the move. And its 8.2in STN screen with a resolution of 640x480 is large enough to see exactly what you're doing.

► PCW February '99, p120



Price £849 Contact HP 0990 474747 Also Recommended Psion Series 5 Price £429.9 Contact Psion 0990 143050 • 3Com PalmPilot Pro Price £229 Contact 3Com 0800 225252 (both PCW May '98)

### COLOUR INKJET

## Hewlett-Packard DeskJet 895CXi

For all-round excellence you can't do better than the HP 895CXi. The quality of its output for both text and graphics is impressive given the swift speed at which they are produced. Even its 'econofast' mode could be used for vital documents, saving both time and ink. It takes a huge range of papers and replacing ink cartridges is a breeze.

► PCW February '99, p151



Price £292.58 Contact HP 0990 474747 Also Recommended Epson Stylus Color 740 Price £272.60 Contact 0800 220546 • Epson Stylus Color 850 Price £318.43 Contact 0800 220546 (both PCW February '99)

### COLOUR PHOTO PRINTER

## Lexmark Photo JetPrinter 5770

For dedicated digital photographers, this printer is ideal, with a 1200x1200dpi maximum resolution and a slot each for direct access to CompactFlash and SmartMedia cards. There's no separate black cartridge bundled, although any standard black Lexmark cartridge will fit.

► PCW April '99, p86



Price £349 Contact Lexmark 01628 481500 Also Recommended Epson Stylus Photo 700 Price £273 Contact Epson 01442 261144 (PCW September '98)

### BUDGET LASER PRINTER

## Kyocera FS-600

This personal 6ppm laser printer easily beats all other laser printers in its class. Its speed is impressive, printing out a steady six pages per minute no matter what the paper coverage, and the quality of its output is second to none, both for graphics and text. It is easily upgradable, taking an impressive 36Mb of RAM. It has a PostScript option and there is even an ethernet port that comes as standard.

► PCW February '99, p199



Price £299 Contact Kyocera 0118 923 0660 Also Recommended Panasonic KX-P6300 Price £257.32 Contact Panasonic 01344 853081 (PCW February '99)

### BUSINESS LASER PRINTER

## Lexmark Optra K1220

It is rare that you find a printer which is both good value and produces exceptional-quality output, yet the Optra K1220 is just such a laser printer. With a rated speed of 12ppm it produces text in good time, but most of all its outstanding quality, both for text and graphics, puts it second to none amongst laser printers.

► PCW February '99, p201



Price £722.63 Contact Lexmark 01628 481500 Also Recommended QMS DeskLaser 1600P Price £816 Contact QMS 01784 445555 • HP LaserJet 4000TN Price £1,316 Contact HP 0990 474747 (both PCW February '99)

### MULTIFUNCTION DEVICE

## Hewlett-Packard LaserJet 3100

Good laser-print quality from this quiet machine. It's intelligent enough to detect a document dropped into its feeder and it will launch an idiot-proof menu for scanning, copying and emailing. Fast, accurate OCR and 2Mb memory for incoming faxes when the paper supply is exhausted, make the 3100 an ideal multifunction device.

► PCW June '98, p83



Price £629 Contact HP 0990 474747 Also Recommended Canon MultiPASS MPC20 Price £370.13 Contact Canon 0181 773 3173 (PCW January '98)

### FLATBED SCANNER

## Umax Astra 610P

Once again, the Umax Astra 610P parallel-port scanner has won our budget flatbed scanner group test, boasting an unbeatable combination of performance and value. Note that our three recommended scanners require enhanced parallel ports found only on modern PCs, so users wanting top performance, or those with older systems, should stick to SCSI.

► PCW September '98, p229



Price £69.33 Contact Umax 01344 871329 Also Recommended Agfa SnapScan 310P Price £116.50 Contact Agfa 0181 231 4200 • Microtek Phantom 330CX Price £75.95 Contact Microtek 01908 317797 (PCW Sept '98)

## DIGITAL CAMERA

### Kodak DC260

Once again Kodak has produced the best digital camera for under £1,000. Not only does it have a high resolution, producing excellent images at 1536x1024 pixels, but it also has a 3X zoom. Add its advanced features, including scripting facilities, and you have a highly desirable and indispensable camera.

PCW October '98, p226



Price £899 Contact Kodak 0800 281487 Also Recommended Epson PhotoPC 700 Price £587.50 Contact Epson 0800 289622 • Ricoh RDC-4300 Price £599 Contact Ricoh 01782 753355 (both PCW October '98)

## MONITOR

### CTX PR710T

Not only does the PR710T look gorgeous, its performance is stunning. It sports a genuine Sony Trinitron tube, which is always a good sign. Power regulation, resolution, colour alignment and colour purity are all of the highest order, leading to a display that you can see is special straight away.

PCW April '99, p182



Price £363.08 Contact CTX 01923 810800 Also Recommended ADI MicroScan GT56 Price £351.33 Contact ADI 0181 236 0801 (PCW April '99)

## MODEM

### Diamond SupraExpress 56e Pro

With ever-shifting goalposts, it makes sense to go for a modem which supports all the current standards, as well as simultaneous voice and data. Combine this with a roaring speed, superb ease of use and a low price, and you have the best-value modem around.

PCW December '98, p211



Price £75 Contact Diamond Multimedia 0118 944 4401 Also Recommended Zoom FaxModem 56Kx Price £89 Contact SCS Data Communications 01494 748904 (PCW December '98)

## REMOVABLE STORAGE

### Sony HiFD

With the same form factor disks as a 3.5in drive, this could replace your floppy but crams a whopping 200Mb onto each disk. Early units will be parallel-only affairs, but will soon be joined by internal ATAPI and PC Card versions. It's a little slow but easy to use.

PCW March '99, p91



Price £149 Contact Sony 01932 816660 Also Recommended Iomega Jaz 2Gb Price £270 Contact Iomega 0800 973194 • Imation SuperDisk 120 Price £105 Contact Imation 01344 402200 (both PCW, August '98)

## SOUND CARD

### Creative Labs Sound Blaster Live!

SoundBlaster cards have long been the best choice for non-professional users. The SoundBlaster Live! ups the ante, providing near-professional quality sound at a bargain price. And, it comes with an impressive bundle of dedicated digital I/O daughtercard, speakers, subwoofer and games.

PCW December '98, p92



Price £149 Contact Creative Labs 01189 344744 Also Recommended Terratec EWS64 S Price £149.23 Contact Terratec 01600 772111 (PCW July '98)

## GRAPHICS CARD

### Diamond Viper V550

Sporting Riva's latest TNT chipset, the Viper V550 graphics card provides absolutely storming 3D performance, with a full 3D feature set and good image quality to boot. Its 16Mb of RAM provides ultra-high 2D desktop resolutions in standard Windows applications.

PCW November '98, p198



Price Approx £150 Contact Diamond Multimedia 0118 944 4400 Also Recommended MetaByte Wicked 3D Price £211.50 Contact Watford Electronics 01582 745555 (PCW November '98)

## ACCOUNTING

### Intuit Quickbooks 6



Touted as the easiest accounting package for small businesses, QuickBooks has a long history and a large user base. Version 6 is the first 32-bit incarnation. It even monitors company performance and sounds the alarm should you fall behind.

► PCW March '99, p92



**Price** £199 (Pro version) **Contact** Intuit 0800 585058 **Also Recommended** MYOB **Price** £229.13 **Contact** Bestware 01752 201901 • **TAS Books Price** £116.33 **Contact** Megatech 01372 727274 (both PCW, June '98)

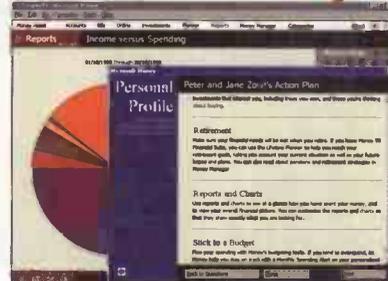
## PERSONAL FINANCE

### Microsoft Money Financial Suite 99



Microsoft Money Financial Suite 99 is our choice for personal finance. It offers online banking and updating facilities, as well as Sage compatibility, all at a bargain price.

► PCW February '99, p80



**Price** £49.99 **Contact** Microsoft 0345 002000 **Also Recommended** Quicken 98 **Price** £39.99 **Contact** Intuit 0181 990 5500 (PCW June '98)

## DATABASE

### Microsoft Access 97



This industry-standard database application is also the best. With its wizards, infamous Office Assistants and standard Windows interface, Access 97 is relatively easy for the novice. And its powerful relational features and VBA integration make it suitable for developers, too.

► PCW November '98, p220



**Price** £299 **Contact** Microsoft 0345 002000 **Also Recommended** FileMaker Pro 4 **Price** £169 **Contact** FileMaker 0845 603 9100 (PCW November '98)

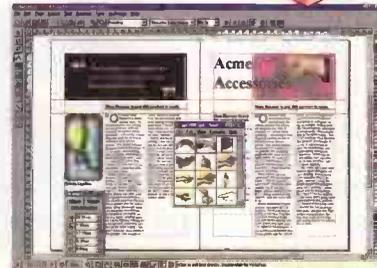
## DTP

### Serif PagePlus 5



Inexpensive, easy-to-use and surprisingly well equipped, PagePlus 5 offers extremely capable desktop publishing. Those wanting the choice of professional publishers will have to fork out more for Quark XPress 4x.

► PCW June '98, p132



**Price** £99.95 **Contact** Serif 0800 376 7070 **Also Recommended** Quark XPress 4 **Price** £1,169 **Contact** Quark 01483 454397 (PCW June '98)

## IMAGE EDITING

### Ulead PhotoExpress 2.0



Ulead has succeeded in removing the frustration factor often involved in getting to grips with digital pictures. PhotoExpress 2.0 is a pleasure to use, with a great, clearly structured interface and fast, in-depth tools. It has pre-set editing modes for the novice and custom adjustments for each editing function, so the power user will be kept happy, too.

► PCW January '99, p202



**Price** £34.95 **Contact** BIT 01420 83811 **Also Recommended** Adobe PhotoDeluxe 3 **Price** £45.83 **Contact** Adobe 0181 606 4001 • **Paint Shop Pro 5 Price** £69.95 **Contact** Digital Workshop 01295 258335 (both PCW January '99)

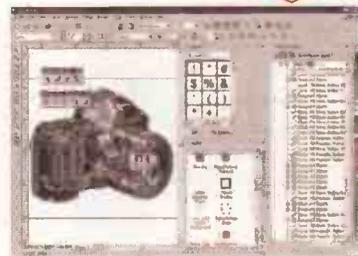
## DRAWING

### Corel CorelDraw 8



Not one of Corel's classic years, but this is still the Windows drawing package to own. Version 8 of this giant suite boasts better drawing and new interactive tools. Artists on a budget should check out Micrografx Windows Draw 6.

► PCW October '98, p203



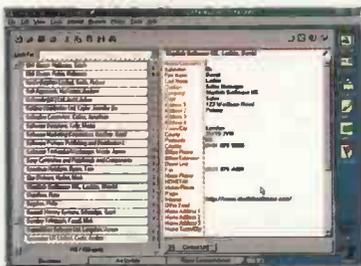
**Price** £464.13 **Contact** Corel 0800 581028 **Also Recommended** Adobe Illustrator **Price** £351.32 **Contact** Adobe 0181 606 4000 • **Freehand Price** £327.82 **Contact** Macromedia 01344 458600 (both PCW October '98)

## INFORMATION MANAGERS

### Starfish Sidekick 98



The best personal information manager boasts wide customisation abilities as its greatest strength. For heavyweight contact management, you need look no further than Goldmine 4 (see the details panel, below).



PCW August '98, p204

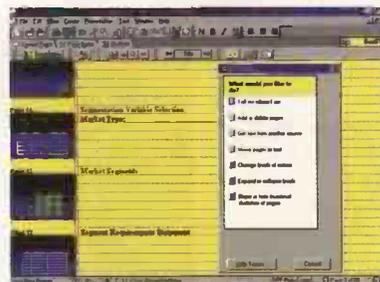
Price £39.99 Contact Starfish 0181 875 4455  
Also Recommended Goldmine 4 Price £229 Contact AVG 0171 335 2222 (PCW August '98)

## PRESENTATION GRAPHICS

### Lotus Freelance 97



This is our choice for electronic presentations. For you, it may also come down to which office suite you own or are considering, but as part of Microsoft Office 97, PowerPoint won't let you down.



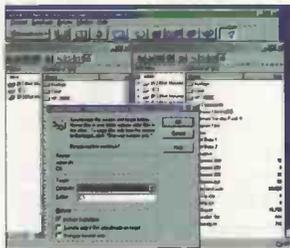
PCW March '98, p200

Price £49.35 Contact Lotus 01784 445808  
Also Recommended MS PowerPoint 97 Price £325.47 Contact Microsoft 0345 002000 (PCW March '98)

## REMOTE ACCESS

### Traveling Software LapLink Tech

The high-end version of this extremely versatile product, LapLink Tech, has all the features of the standard version but also lets you print from the host machine onto a remote printer, or vice versa, and talk to whoever is using the host machine. It includes anti-virus and hard-disk cloning utilities.



PCW December '98, p233

Price £169.95 Contact Traveling Software 01344 383232  
Also Recommended Symantec pcAnywhere Price £75.08 Contact Symantec 0171 616 5600 (PCW December '98)

## WEB DESIGN

### Macromedia Dreamweaver 2



An attractive and easy to use interface make this great for those looking for something with a little more power. Good table handling, and extensive formatting options on a single, centralised property inspector, make it a joy to use.



PCW April '99, p103

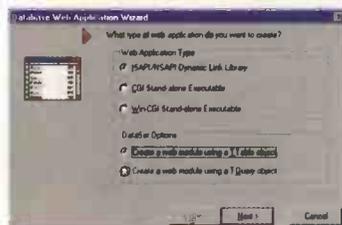
Price £229 Contact Computers Unlimited 0181 358 5857  
Also Recommended Adobe PageMill 3.0 Price £92.83 Contact Adobe 0181 606 4000 (PCW March '99)

## PROGRAMMING TOOL

### Inprise Delphi 4



Delphi is not a cross-platform product, but does let you build browser-independent web applications. It reaches all the way from RAD business applications to fast graphics using DirectX. It beats Visual C++ on ease of use, and Visual Basic on performance.



PCW April '99, p198

Price from £92 to £1845 Contact Inprise 0118 932 0022  
Also Recommended Symantec Visual Cafe Price £217 or £580 Contact Symantec 0181 317 7777 (PCW April '99)

## ANTI-VIRUS

### Norton AntiVirus 4.0



Norton AntiVirus 4.0 is our choice for protecting your PC. It offers the best combination of features, ease of use and performance. Its virus detection rate is first class and there are free online updates for the life of the product.



PCW April '98, p124

Price £49 Contact Symantec 0171 616 5600  
Also Recommended Dr Solomon's HomeGuard Price £29 Contact Dr Solomon's 01296 318700 (PCW April '98)

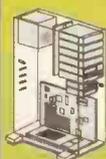
# MicroMart

**\*Available Now\* - The everlasting PC! -Stays up to date!**

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**Building & Upgrading Your PC. \*Now Double the content\*.** Up from 40,000 to over 85,000 words - that's over half a million characters - nearly 300 A4 pages! (inc. TOC etc. - equivalent to over 600 pages regular paperback).  **aimed at the beginner up to intermediate level our comprehensive workshop manual now includes:** \*More\* in depth guide to understanding and buying the components. \*More\* on assembly, setup and test. \*More\* on troubleshooting. \*More\* on upgrading. How to add a modem, sound card, CD ROM, scanner, extra drives etc. \*More\* on IRQ,s, DMA,s, memory addresses etc. both for legacy and PnP systems but still explained for human beings! \*More\* on recent technology including: the PII processor, the BX chipset, SDRAM, CD-R & -RW, DVD-ROM, -R & -RAM. AGP video port etc. Plus photos throughout. And much, much more. Complete updates are available to existing customers so you can keep your info up to date without paying the full price again. Now includes section of fixing the Year 2000 'bug', together with utility on the free disk. Why get landed with a large bill when you can fix the problem yourself? Better still learn to fix other's computers as well! There's a shortage of engineers to do the job and it's getting worse as the deadline approaches.



**All this from just £12.95 for existing, and only £19.95 for new, customers.**

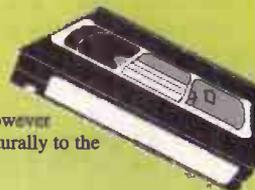
**Includes a FREE DISK:** Diagnostics and utilities for you to try. Includes: Year 2000 utility to diagnose if a system is 'compliant' (use in conjunction with the manual). System Checker to interrogate your PC as to what hardware components are installed and what resources they are using. More utilities for: backing up and restoring the Windows 95 registry, installing the upgrade version of Windows 95 without first installing DOS or Windows 3.x, analysing memory use in Windows 3.x, hard drive tools to fix problems & recover lost data and more. This will help you get your PC tuned up - an invaluable addition to any engineers toolbox.

**\*VERSION 2.0\* of video!** Yes, it's like having a PC expert in your own home actually showing you step-by-step how to build a multimedia, Internet-ready PC. Now featuring a mini-tower machine.

**From just £7.95 for existing, and only £15.95 for new, customers.**

**Why not get the pair!** Both the book and the video look at the theoretical and practical aspects of working on your PC. However the medium of the page lends itself more naturally to the theoretical side while the medium of the television lends itself more naturally to the practical side. The combination of the two is really recommended as a complete home course.

**And both are yours from just £19.95 for existing, and only £29.95 for new customers.**



**Satisfaction Guaranteed.**

Examine Macmin's pack for 30 days in the comfort of your own home. If you are not delighted simply return in good condition for your refund.



**Don't just take our word for it!** "The manual has now become my Bible, I refer to it whenever I embark on the assembly of a PC." - B.U.P.F., London. "...presentation and content are of an excellent standard." - N.P.C., Oldham. "This seems to be the answer to most questions involving the building and upgrading of computers." - D.N., E-Mail. "...superbly informative." - P.S., Sussex. "...congratulate you on an extremely well presented manual and video..." - D.W.A., Coventry. "Your publication on this subject is quite the best I have yet come across." - E.G., Stafford. *The full identities of the people above are protected for their privacy. The original unsolicited testimonials are retained at our offices for inspection.*

**Beyond the basics.** Have you already built PC's before? Are you looking for the intermediate to advanced level? Are you a Pro or Semi Pro? Then try the world famous (over 1.5 million copies sold) Que's Upgrading & Repairing PC's by Scott Mueller.

**\*\*\*\*Special 10th Anniversary edition\*\*\*\***

\* Hardback as standard! \* 1,500+ pages! \* 2 special CD's include: 30+ mins PC build video. Searchable, printable versions of 3 books inc. Upgrading and Repairing Networks - over 5,000 pages of text in all! A+ Cert. exam questions, Micro House Library of 7,000 hardware installation manuals. Many professional utilities e.g. Check-IT pro, a drive copy utility - too much to mention in space!

- Is used by professional engineers but not written exclusively for them
- Includes detailed information & specifications for every component in your PC
- Contains all the information you need to maintain or enhance any type of PC compatible system
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Don't just take our word for it though:

"Use Upgrading & Repairing PC's and fix it right first time." - Edward Griffin, Computer Shopper. Priced at £49.49 (RRP £51.49). If not delighted we can exchange from a list of 4,500 titles - we have manuals to suit every level.

**Free disk to keep anyway!**

We are so confident that you will like our products that we are, for a limited period, making the following offer: You may keep the Free disk even if you return the Building & Upgrading Your PC for a refund.

We can't tell you everything on this page

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If you require more info first then phone or write or E. Mail for our FREE info pack, or FAX back. Or see our Internet page. Details at bottom.

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(Ask for Dept. PCW01)

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1	Manual & FREE disk	£19.95	£12.95		
2	Video 45 min. tape	£15.95	£7.95		
3	Complete Course (Packs 1 - 2)	£29.95	£19.95		
	Diagnostic utilities £2.95 if buying separately. FREE with above	£FREE	-		
	Que's Upgrading & Repairing PC's	£49.49	-		
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	Any extra overseas postage (see below)				
	Total				
	All charges include VAT where appropriate				

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Or Phone 07000 12 00 12. Or E. Mail: john\_macmin@compuserve.com. Fax: 0117 90 200 81.  
Internet WebSite: http://ourworld.compuserve.com/homepages/john\_macmin**

# Faxback Service

## Missed a feature or a review? Try our 24-hour faxback service.

Updated every month, our easy-to-use Faxback service gives you instant access to a complete range of product reviews, features and workshops via your fax machine. To use the service, simply follow the instructions below. Calls are charged at 50p per minute at all times, with an average duration of four minutes.

Our service is available 24 hours a day, 365 days a year. (The faxback service is not available outside the UK.)

- 1 From the choices below, **select the article(s) you wish to receive**. Note the number of pages in the article.
- 2 Using the handset on your fax machine, **dial 0660 600632**. If you do not have a handset, press the fax machine's On Hook or Telephone button, then enter **0660 600632** on the keypad.
- 3 There will be a vocal introduction to the Faxback service which will ask you to enter the code of the article(s) you require. The voice will then ask you to **press the Start / Send** button on your fax machine.
- 4 The article(s) you have requested will now come through your fax machine.

## IMPORTANT INFORMATION

For the faxback service to work correctly, you must be referring to the current issue of *Personal Computer World*, and have your machine set to use tone dialling (you may need to switch your machine from 'pulse' to 'tone').

If you have any problems with the *Personal Computer World* faxback service, please call 0171 412 3795. This helpline is open from 9:00am to 5:30pm Monday to Friday, and calls are charged at the standard rate.

## Faxback Table

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## News & Views

### Spread 3.0

Do You Write Database Front-Ends?

Spread 3 is ideal if you want to create powerful database front-ends, manage the display and entry of two billion rows and columns, print and preview reports, perform calculations or take advantage of unparalleled cell-level formatting with twelve built-in cell types. All in one control.

New features include ADO binding (as well as DAO/RDO), Excel 97 import/export, HTML export, Print Preview, OLE drag & drop, text tips, load/save data from/to an integer or float array and IntelliMouse support. Spread 3 also fully supports Visual Basic 6 and Visual C++ 6.

### Data Widgets 3.1

Award-Winning Grid For Visual Studio 6.0

Data Widgets 3.1 is a set of six ActiveX controls, including Sheridan's award-winning DataGrid, that fully support the OLE DB & ADO data sources available to Visual Studio 6.0 developers. OLE DB & ADO provide a uniform access method to a variety of relational & non-relational data sources. You can format and print reports directly from the DataGrid and export the DataGrid directly to HTML or to a delimited file. Also, masked editing is built directly into the DataGrid and DataCombo.

### SpyWorks 6.0

Does Visual Basic Get In The Way Sometimes?

We all know that Visual Basic and other development tools do a great job of hiding the complexity of Windows programming (remember the horrendous "Hello World" program in Petzold's book?). However, they also hide some of the functionality of Windows which you occasionally need to use. SpyWorks exposes this hidden functionality so you can create application extensions, implement system-wide hotkeys or macro recorders and add other low level features to your applications.

This latest version has smaller ATL-based controls and supports cross-thread subclassing, Visual Studio 6.0 (including the new multi-threading features in Visual Basic 6.0), Windows 98 and Windows 2000. The Professional now includes a full WinSock control (with Visual Basic source code) and lets you create NT services in Visual Basic.

### True DBSuite 6.0

Are You Developing Database Front-Ends With Visual Studio?

True DBSuite 6.0 is the essential suite of data-aware controls for those of you developing database front-ends in Visual Studio. The suite contains True DBGrid Pro 6.0 (the official upgrade grid for Visual Studio), True DBInput 5.0, and True DBList Pro 5.0, which offer a complete set of data presentation, data input, and user interaction features to produce quality applications quickly and cost-effectively.

### DevPartner Studio 6.1

Everything You Need To Improve The Quality Of Your Visual Studio Applications

DevPartner Studio 6.1 is a comprehensive suite of tools that can help you to improve the quality of your Visual Basic, Visual C++ and Java applications and components. It includes everything in DevPartner for Visual Basic, DevPartner for Visual C++ and DevPartner for Java and also includes Numega's outstanding advanced debugger, SoftICE for Windows 95/98/NT. It even includes the 16-bit DOS & Windows 3 versions of BoundsChecker and SoftICE for maintaining legacy code. This package is exceptional value for Visual Studio developers.

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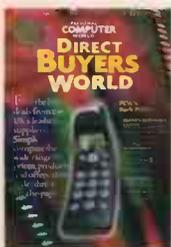
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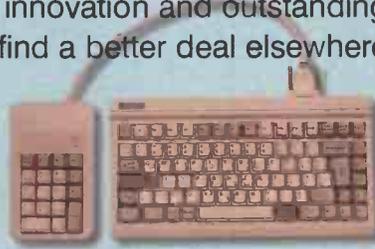
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# chipchat

## The best things in life are free?

**T**hey say there's no such thing as a free lunch, although I'm sure I had one the other day...

But one thing's for certain: *there's no such thing as a free ISP*. Now, at this point we could go down one of two paths, the first supporting all those frustrated users who've been disappointed by the service they've received, or rather *not received* from their free ISP. Sadly for them, I'm going to take the other path.

**This month**, the desk of Ivor Bugbear has been overflowing with letters, emails, faxes and phone messages whingeing about free ISPs. Maybe it's the weather, or perhaps new year blues. I reckon it could have something to do with the fact that next to nothing in life is free and a great deal of people are once again disappointed to have discovered this.

### Lets look at the facts.

Everyone wants to get on the internet and no-one likes unnecessarily spending money. So, when someone offers a free internet service, the public sign up in their droves. You can't really blame them for trying to save some wedge, since most of us in this country are still paying for local-rate calls. However, I feel I can blame people who switch from a perfectly good

working ISP to a free service, discover it wasn't all they expected, then proceed to call me at every opportunity to complain about it. Well, I'm sorry if it has caused you inconvenience, but you had a working system and chose to change it for something free of charge, expecting it

ISPs have plenty of other things they want to get off their chests.

**Now this may be coincidence**, but in the PCW office we've noticed that the past few months' worth of email unhappiness has been sent by users of free ISPs. These letters complain about

companies, products or services which have not come up to scratch; some also usefully point out where we have neglected to insert various punctuation marks in our text.

Now, it's always good to hear when things are not going as they should, but like I say, most of these messages seem to come from free ISP addresses. Of course, it would be wrong to say that the type of people who refuse to pay for an ISP are the same as those who like to moan. It's simply the fact that with considerably more subscribers than any other ISP, the free ones will statistically have more complainers — people who no doubt will now be redirecting their venom toward yours truly. So remember, letters of complaint to Ivor Bugbear accepted from pay-ISPs only!

IVOR BUGBEAR



to offer the same level of service. Call me a cynic, but I'm not entirely surprised there are so many disappointed customers of free ISPs; after all, they are *free*, so what were you expecting? It would appear, though, that users of free

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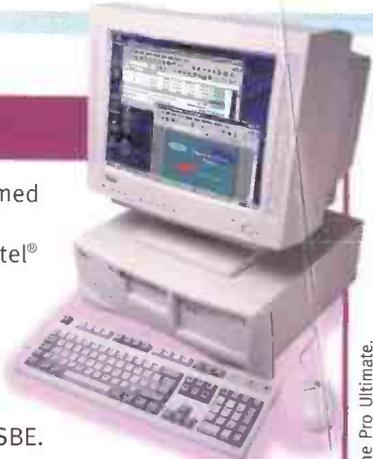
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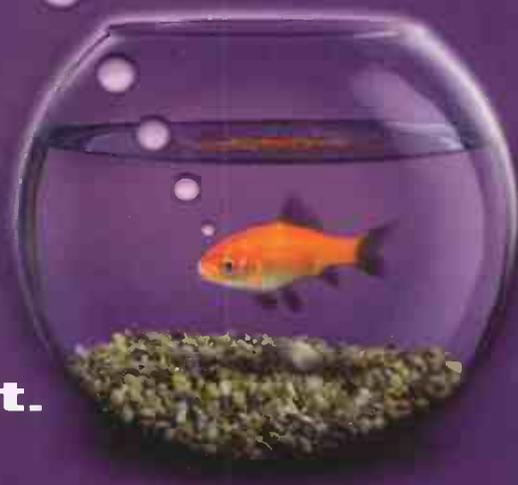
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