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Buyers Guide
p326

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- ◆ Integrated 64-bit PCI Local Bus Video with 1Mb video memory
- ◆ 15" Colour SVGA Monitor (13.75" Viewable Area)
- ◆ 3 PCI, 2 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Mid-Sized Desktop Chassis

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- ◆ 16Mb High Performance SDRAM
- ◆ 512Kb Pipeline Burst Cache
- ◆ 2Gb EIDE Hard Drive
- ◆ Integrated 64-bit PCI Local Bus Video with 2Mb video memory
- ◆ 15" Colour SVGA Monitor (13.75" Viewable Area)
- ◆ 3 PCI, 2 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Twelve Speed CD-ROM Drive
- ◆ Mid-Sized Desktop Chassis
- ◆ Microsoft Office Professional 95

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- ◆ Intel 200MHz Pentium Pro Processor
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- ◆ 32Mb EDO RAM
- ◆ 256Kb Cache
- ◆ 3Gb EIDE Hard Drive
- ◆ Matrox Millennium 64-bit PCI graphics card with 4Mb WRAM
- ◆ Twelve Speed CD-ROM Drive
- ◆ 15" Colour SVGA Monitor (13.75" Viewable Area)
- ◆ 3 PCI, 3 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Mid-Sized Desktop Chassis
- ◆ Windows NT Workstation 4.0
- ◆ Microsoft Office Professional 95

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- ◆ 3Gb EIDE Hard Drive
- ◆ STB Powergraph 64 3D™ graphics card with 2Mb EDO video memory
- ◆ 15" Colour SVGA Monitor (13.75" Viewable Area)
- ◆ 3 PCI, 2 ISA and 1 PCI/ISA Shared Expansion Slots
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- ◆ Integrated 16-bit Sound (Speakers Optional)
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- ◆ Intel 440FX PCIset
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- ◆ 256Kb Cache
- ◆ 4.2Gb EIDE Hard Drive
- ◆ Matrox Millennium 64-bit PCI graphics card with 4Mb WRAM
- ◆ High Performance TCO 17" Colour SVGA Monitor (15.65" Viewable Area)
- ◆ 3 PCI, 3 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Twelve Speed CD-ROM Drive
- ◆ Mid-Sized Tower Chassis
- ◆ Window NT Workstation 4.0
- ◆ Microsoft Office Professional 95

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AS RECOMMENDED BY PC PRO (March 1997)

- ◆ Intel 200MHz Pentium Processor with MMX technology
- ◆ Intel 430VX PCIset
- ◆ 32Mb High Performance SDRAM
- ◆ 512Kb Pipeline Burst Cache
- ◆ 3Gb EIDE Hard Drive
- ◆ Matrox Millennium 64-bit PCI graphics card with 4Mb WRAM.
- ◆ High Performance TCO 17" Colour SVGA Monitor (15.65" Viewable Area)
- ◆ 3 PCI, 2 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Twelve Speed CD-ROM Drive
- ◆ AWE 32 Sound plus Altec Lansing ACS290 Speakers
- ◆ Mid-Sized Desktop Chassis
- ◆ Windows NT Workstation 4.0
- ◆ Microsoft Office Professional 95

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- ◆ Intel 200MHz Pentium Pro Processor
- ◆ Intel 440FX PCIset
- ◆ 32Mb EDO RAM
- ◆ 256Kb Cache
- ◆ 4.2Gb EIDE Hard Drive
- ◆ Matrox Millennium 64-bit PCI graphics card with 4Mb WRAM
- ◆ High Performance TCO 17" Colour SVGA Monitor (15.65" Viewable Area)
- ◆ 3 PCI, 3 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Twelve Speed CD-ROM Drive
- ◆ Mid-sized Tower Chassis
- ◆ AWE 32 Sound plus Altec Lansing ACS290 speakers
- ◆ Windows NT Workstation 4.0
- ◆ Microsoft Office Professional 95

DELL FINANCE 3 YEAR RENTAL: £16.45 PER SYSTEM, PER WEEK, EXCLUDING DELIVERY AND VAT.

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PC PRO "EXCELLENCE" AWARD (June 1996)

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- ◆ 256Kb Level 2 Cache
- ◆ 1.3Gb EIDE removable Hard Drive
- ◆ Internal 6X CD-ROM and 3.5" 1.44 floppy Disk Drive
- ◆ Integrated Audio system with 'Spatializer' 3D Stereo and integrated speakers
- ◆ High performance 128-bit PCI graphics controller
- ◆ Infrared communication ports - front and rear ('Fast' IRDA 1.1 compatible)
- ◆ Mindpath IRDA Pointing Device
- ◆ 2 PCMCIA type II and/or I type III slots - Cardbus capable
- ◆ 19mm 'optical' trackball mouse
- ◆ 'Smart' Lithium Ion battery pack

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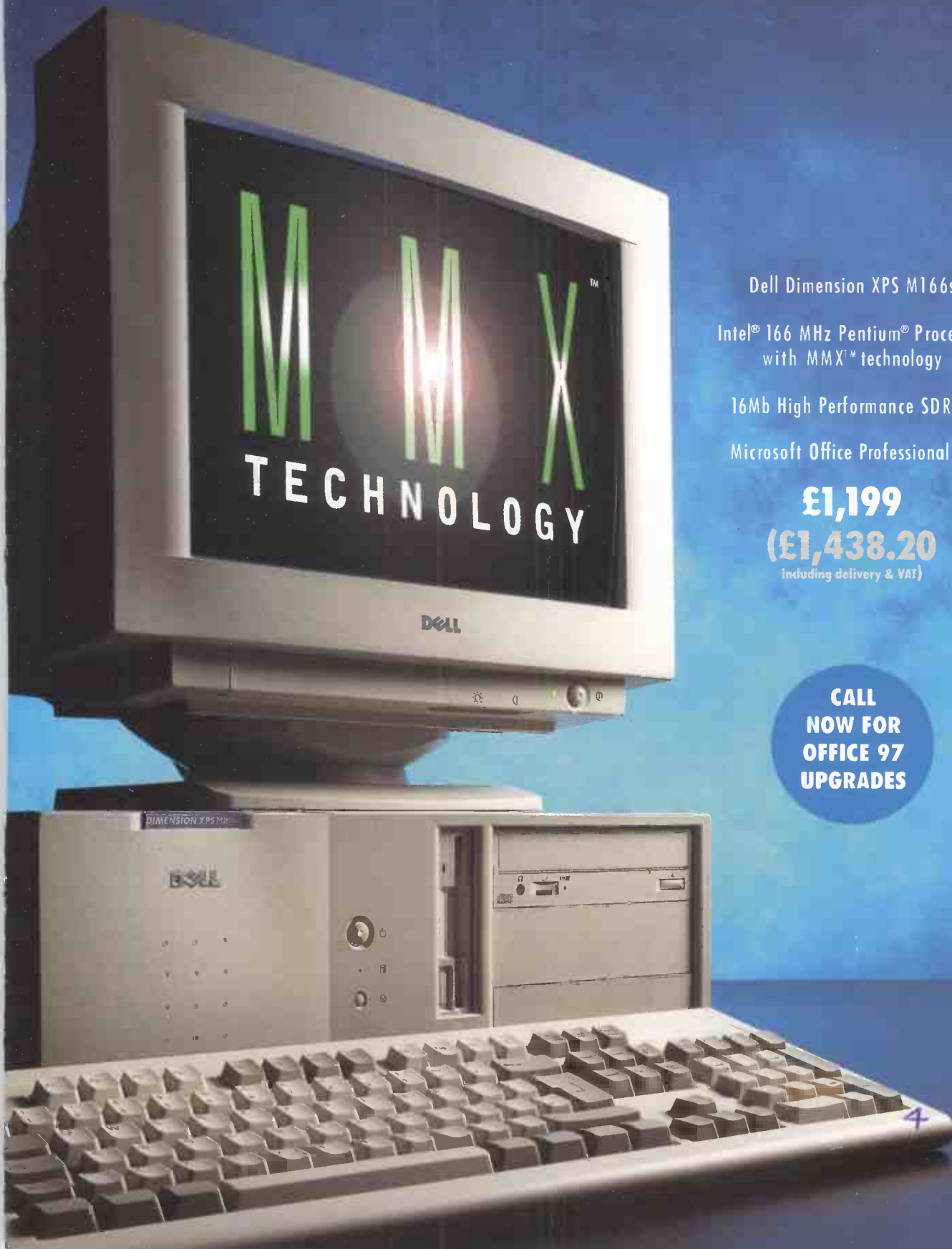
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- ◆ STB Powergraph 64 3D™ graphics card with 2Mb EDO Video Memory
- ◆ 15" Colour SVGA Monitor (13.75" Viewable area)
- ◆ 3 PCI, 2 ISA and 1 PCI/ISA Shared Expansion Slots
- ◆ Twelve Speed CD-ROM Drive
- ◆ Integrated 16-bit Sound and ACS90 Speakers

- ◆ Mid-Sized Desktop Chassis
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- ◆ Intel 150MHz Pentium Processor
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- ◆ 256Kb Level 2 Cache
- ◆ 1.3Gb EIDE removeable Hard Drive
- ◆ Internal 6X CD-ROM and 3.5" 1.44 floppy disk drive
- ◆ Integrated Audio system with 'Spatializer' 3D Stereo and integrated speakers
- ◆ Infrared communication ports - front and rear ('Fast' IRDA 1.1 compatible)
- ◆ High performance 128-Bit PCI graphics controller
- ◆ Mindpath IRDA Pointing Device
- ◆ 'Smart' Lithium Ion battery pack
- ◆ 2 PCMCIA type II and/or 1 type III slots - Cardbus capable
- ◆ 19mm 'optical' trackball mouse



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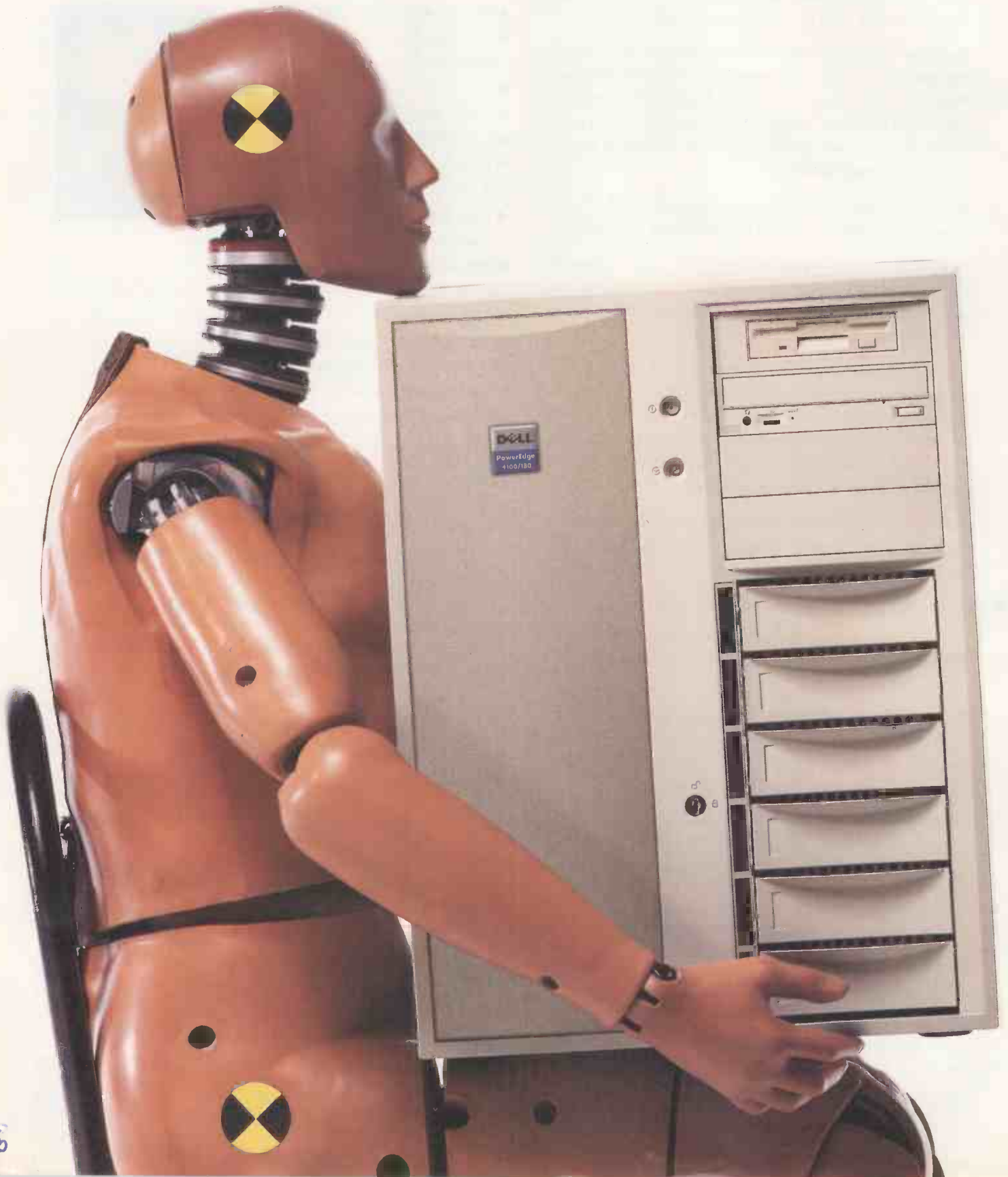
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PC MAGAZINE, FEBRUARY 1997.

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PC WEEK, JANUARY 1997.

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Personal Computer World



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Editorial

For this month's PC Group Test (p134) we have taken a bold leap into the uncharted waters of the PC bargain bins. Being something of a first for us, we weren't too sure what we would end up with as our specification laid open



our test pages to brands which would be new to PCW.

There continues to be a school of thought which suggests that the only PCs worth buying are those with the letters I, B and M inscribed upon the fascia. There is some truth in this: major brands such as IBM, Compaq, Dell and

others do tend to use better-quality components and pay more attention to the standard of construction, inside and out. They also cost more.

This is why buyers often turn to the ranks of the clone makers where they believe a similar-performance PC is available at a fraction of the cost. Such PCs are easy to make — all the components are available off-the-shelf and anyone with a corrugated iron shed on a windy industrial estate can set themselves up as a PC manufacturer. The trouble is that all too often, these manufacturers source poor-quality components to enable them to pare away the price of a PC to the minimum. They also care little for internal layout, expansion or general design, so what buyers gain in initial savings, they may lose in downtime and repairs.

Perhaps there is cause for optimism however in our Group Test results. It seems that you can get a decent machine with a Pentium 133MHz which performs well, is well built, and could last beyond the normal life cycle of a business PC. This proves that with care, attention to detail and a little forward thinking, a genuinely good PC can be built at aggressive prices. In other words, PCs that have been *designed*. These companies could become the Compaqs and the Gateway 2000s of the future. It seems such a simple lesson; the real wonder is just why so few manufacturers bother to learn it.

Of course, properly structured long-term tests would be needed to discover just how well these machines serve on a daily basis. But rest assured, *Personal Computer World* will endeavour to find out.

PJ Fisher
Managing Editor

Next Month

VNU European Labs place
166MHz MMX Pentiums and
17in monitors under their
intense scrutiny.



MMX PCs

P166 MMX PCs:
Could this be the new
business standard?
Dylan Armbrust takes
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the desktop.

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Desktop Publishing Group Test

May '97 issue

■ On sale Thursday 3rd April

June '97 issue

■ On sale Thursday 1st May

* Next month's contents subject to change.

**Personal
Computer
World**

April Cover disc

Introducing issue 8 of our new-look PCW CD-ROM. The disc is packed full of games, multimedia, music, hints and tips, and resources to download to your hard disk.

The CD is divided into nine sections, each with its own icon. Each of the nine section buttons is almost always visible on-screen so you can move from section to section just by clicking on that button, rather than having to continually return to a home page. If you are not sure where each section is, roll over the buttons and the name of that section will be displayed along with a contents list for the section. Exit the disc by clicking on the "Q" in the bottom left of the screen.

Arts

An interactive Jukebox containing the track Alive by Triggerfish and thirty-two 24-bit colour images from the Image Bank.



How to use the CD-ROM



1. Quit existing applications.
2. Put the disc into your CD-ROM drive.

3. Win 95: If you've got Windows 95, the PCW interactive loader will appear on your screen. If your CD doesn't auto-load, start Windows Explorer and double-click PCW.exe.
Win 3.1: From Windows Program Manager choose File/Run, then type in <CD Drive>\PCW.exe and press enter.

4. Click on main menu. If you don't have Quicktime for Windows, Video for Windows or Acrobat with search plug-in installed, you will be offered the chance to install them before continuing.

Hardware requirements

To run the CD-ROM, you need a PC with Windows 3.1 or later and a colour VGA display. We recommend a multimedia 486 or Pentium PC with a minimum 8Mb of RAM. The optimum configuration is a 16Mb Pentium.



Possible CD-ROM problems

1. If you have launched Acrobat reader in the Hands On section and cannot find the search icon described in the first page of notes, this may be because you already have a copy of Acrobat reader on your C: drive, so the autostart for this cover disc is not asking you to install our version which includes the search facilities. You can either delete your Acrobat reader from the C: drive, or change its name and run PCW.EXE again, which this time should ask you to install the Acrobat reader with search facilities.
2. If you get a message such as "Not ready reading drive D:", you may have a dud CD.

Return the disc to: TIB plc, TIB House, 11 Edward Street, Bradford DB4 7BH, for a free replacement.

■ For other problems concerning the CD, call 0891 715929. Calls cost 39p/minute off-peak and 49p at all other times. (From 19th February all calls will cost 50p/minute.)

Games

Here you can preview the featured games on this month's CD. Some you can play straight away, others you'll need to install first or can only play from DOS.



Reference

PCW reviews index, advertisers' index, glossary and general information about the CD.

The Room

Browse through VNU's re-designed web e-zine called The Room, and see the first winning entry for the "Write an episode for the Stoney Blokes cartoon" competition.



Browse through VNU's new e-zine, even if you're not on the web

Software Library

A library of shareware, utilities and drivers, each with a brief description which can be copied onto your hard disk, using the Netscape browser.

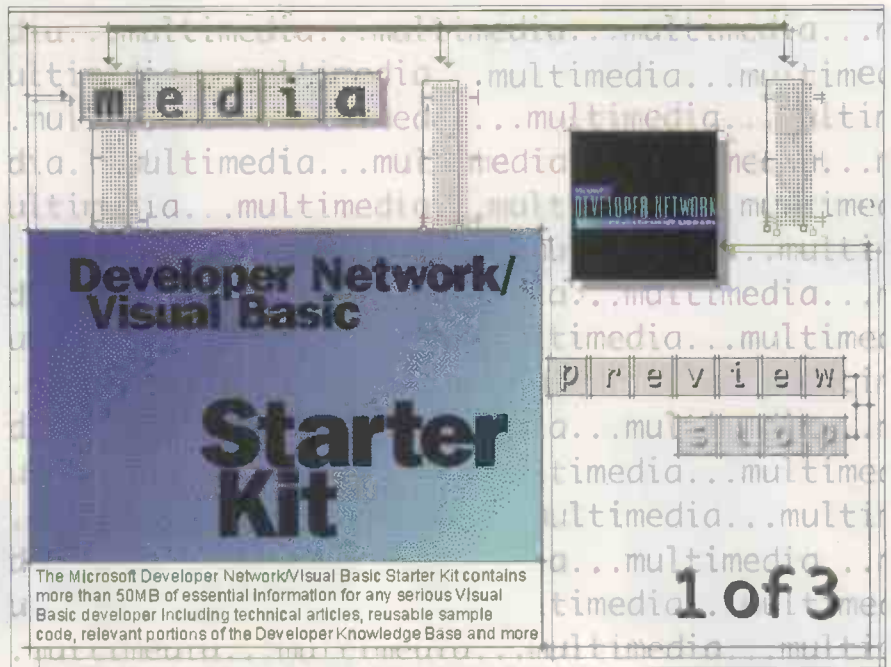
Multimedia & Featured Software

To preview any of the multimedia demonstrations, either drag one of the images along the bottom into the box in the top right corner, or double-click one of

Error!

If you experience any problem running any of the Software Library programs once you have copied them from Netscape, please do the following:

1. Delete the directory you copied them to.
2. Re-select them in the Software Library section.
3. Ensure that ONLY "copy" is ticked. That is, untick the box "decompress".
4. After copying the file, unzip it manually using PKUnzip.



Above Includes sample code and technical help

Right A contact management package

Below Choose G-Nome — a futuristic destruction game



CompuServe CD

PCW and CompuServe — giving you more on CD

CompuServe's latest cover CD contains more than ever before, including CompuServe 3.0.1 for Windows 95. For budding webmasters there's Home Page Wizard and HoTMetal Light so you can start building your own web pages to put up on CompuServe*.

When you aren't toiling away on your personal home page, there's demos of Sonic the Hedgehog from Sega and Syndicate Wars from Bullfrog Productions to keep you amused.

The CD also includes Superscape Viscage, SSEYO Koan Pro, CompuServe WorldsAway, Tesco Wine Selector and

Tesco Recipe Selector.

(*To join CompuServe, follow the on-screen instructions.)

■ Following our competition with CompuServe and Air UK in the December 1996 issue of *PCW*, congratulations to the ten lucky winners:

Phil Atkinson, Birmingham; Steve Fox, Warminster; Alec Whitfield, Hereford; Ian Rigg, Stockport; David Stout, Longstanton; Steve Ashton, Grimsby; Rhodri Evans, St Albans; Iain Duncan, Fife; Chris McCarthy, Birmingham, and Dave Griffiths, Bere Alston.

Please note: CD contents subject to change.



In Sega Rally, if you're stuck behind someone bang 'em out of the way and put your foot down!



Fast Track

If you would prefer to play or install the Games and Multimedia demos from outside the main *PCW* interface, or want to know the location of the Software Library home page (in order to use your own internet browser rather than the default Netscape browser), click on the HELP button on the *PCW* loader. This help/info file also contains the locations of other items on the disc, along with a full contents list and help tips.

combines high-speed driving adventure with neat moves such as flying over jumps, sliding around corners and side-swiping other cars.

G-Nome — (Sorry Windows 3.1 users, G-Nome is Windows 95 only). G-Nome, by 7th Level, is a futuristic destruction game set on the planet Ruhelen. Union Sergeant Joshua Gant must assemble a team of experts and penetrate Scorp Republic to destroy the ultimate genetic soldier, the G-Nome, before that creature can be deployed in battle.

Ultimate Soccer Manager 2 — If you've ever fancied yourself as a football manager you'll love Ultimate Soccer Manager 2, by Sierra. Decisions range from drawing up plays that will be used during a match, to choosing what kind of merchandise is sold at your fan shops.

The Settlers II — The Settlers II is made by Bluebyte Software. It is a variation on the Sim City game and is set in the last century in a world of amazing colour and detail.

those images. This month the four featured software demos are:

Microsoft Development Network — A Visual Basic starter kit containing essential information including technical articles and re-usable sample code.

OfficeForms (Win 95) — Toplevel's latest forms package.

MultiMusic — A music sample resource, by Mantra, with song construction facilities.

Goldmine 3.2 (Win 95) — A contact management package.

Games

To preview any of the games, either drag one of the images along the bottom into the box in the top right corner, or double-click one of those images.

Destruction Derby 2 — This is the first of two fast driving-game demos included on this month's disc. Complete with realistic crashes, steep hills, jumps and banked corners, it plays as smoothly and excitingly as the original, and has a pit area for repairs.

Sega Rally — (Sorry Windows 3.1 users, Sega Rally is Windows 95 only). Sega Rally

Please note:

The demos featured in the Games and Multimedia sections can be previewed and some will run from the *PCW* main interface. However, due to technical issues concerning the software supplied to us, some demos will not run alongside the interface and others require installation to your hard disk.

Using the Hands On section

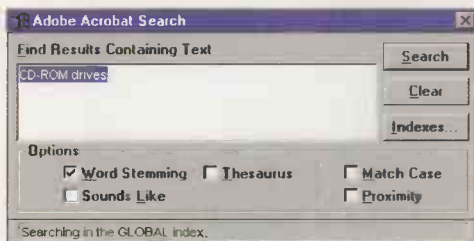
You can load Acrobat either by selecting Hands On from the launch menu or by going into the Hands On section of the main menu.



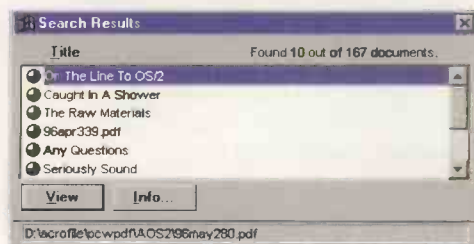
To search Acrobat files, just click on the search icon. A dialog will appear. Merely type in the word you want to search for and click the icon.

In a second or so, the search results dialog will appear containing a list of the files which contain that word.

You can then view any of the files. The word you search for ("CD-ROM drives" in our example) is highlighted. On average-sized monitors the text will be greeked, but you can use the magnifying glass icon to expand the text: just click on the icon then, with your mouse, select the area of the page you want to magnify.



Just type in the word you want to search for — in our case, CD-ROM drives



In a second or two, a list of all the files containing that word will appear

Please note:

Even if you have previously installed Acrobat Reader 3.0 from the Software section, when visiting our Hands On section for the first time you will be asked to install Acrobat. This is because in order to search across the PDF files, you need the search plug-in which is installed with Adobe Acrobat Search for CD-ROM, but not Acrobat Reader 3.0.

Using the Software Library section

The files in this section are copied to your hard disk using the default Netscape browser on the CD.

If you already have your own frames-compatible browser installed and want to access the resources section, run your browser, go to File Open and open D:\html\res\resource.htm.

Compressed Zip files or self-extracting archives

Most files in this section are compressed zip files or self-extracting archives. Click on the file that you would like to copy to your hard disk. A box will appear, stating the name of the file to copy and the destination directory. Click on OK. If using the default browser, you will be given the option of:

1. Copying the file only, from the CD to a destination of your choice, with no further action.

2. Decompressing the files contained in the archive into the destination of your choice.

By selecting both of the above you can copy the file *and* decompress it into your chosen location. If you have to abort the copy, and subsequent attempts to download the same file give an unexpected filename, go to c:\nuu\netscape and delete the copy of the file contained therein. Next

time you click on the hypertext link, the transfer should work okay.

Other file types

Click on the file you would like to copy to your hard disk. This will bring up the "save as" dialog box. Choose where you want to copy the file (make sure you don't try to copy the file to the CD itself, or you will get an error message). It's a good idea to create a directory or folder for it first (using Windows File Manager or Explorer).

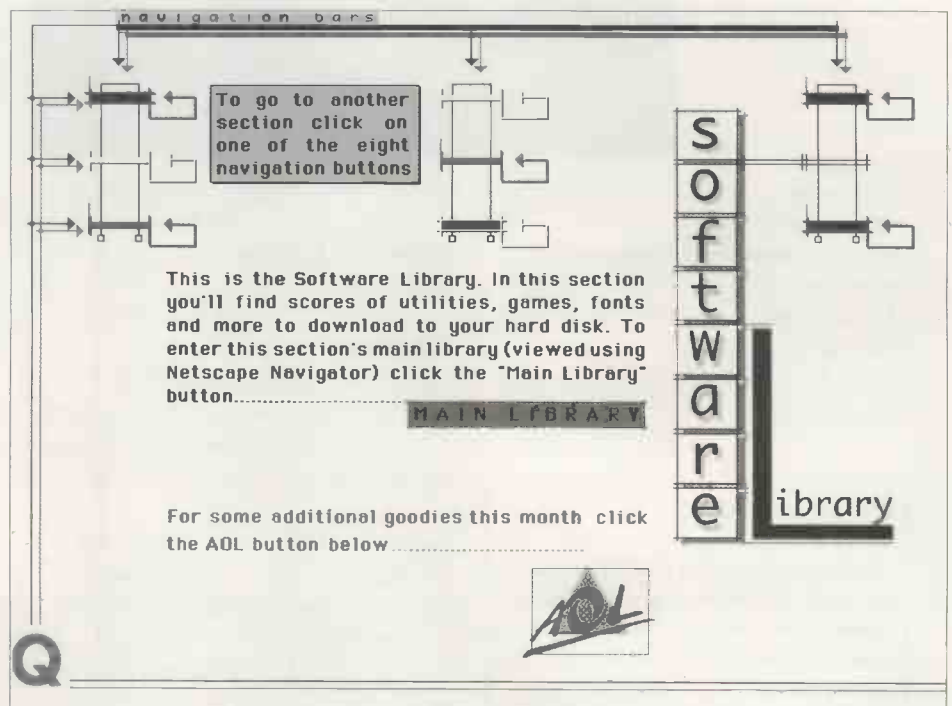
Note: Avoid copying any of the resources files into your Windows directory or into the root of your C: drive.

Using Netscape

The *Personal Computer World* Interactive CD-ROM uses Netscape as the delivery mechanism for the resources section and to run The Room.

If you're on the internet, chances are you're already using Netscape and have a rough idea of how it works. If you're not, this provides a great opportunity to find out what this browser business is all about.

You navigate through web (or HTML) pages using hyperlinks. These are images or, more often, highlighted text which takes you backwards and forwards through different pages. You can also move between pages you've already



All the goodies are here. From our Hands On section files to Goldmine, from an Alicia Silverstone screensaver to Netscape Navigator, Acrobat Reader and more. There's something for everyone

visited by using the back and forward arrows on the toolbar.

Netscape 2.0 also has a feature called "frames" which divides the screen into separate areas. When using frames, use the right mouse button, rather than the arrow keys, to move backwards and forwards.

When using Netscape from within PCW Interactive you'll need to go to File/Exit to return to the main screen.

Installing PKUnzip or Winzip

Zip files are the standard compression format for distributing programs and utilities on the web and on floppy disk. If you choose to copy the resources zip files onto your hard disk and decompress them later, you will need to install PKUnzip or Winzip before you can "unzip" them. Go to the Essential Utilities section and click the link "PKZip/PKUnzip" or "Winzip".

■ **Winzip:** choose Winzip and a new page will appear offering you Winzip for Win95 and Winzip for Windows 3.11. Select the appropriate platform and save it to a location of your choice. If you have less than 16Mb of RAM it's probably a good idea to quit Navigator, and the PCW CD next. Then use File Manager or Explorer to find Winzip95.exe or wz60wn16.exe.

■ **PKUnzip:** choose PKUnzip and save pkz204g.exe to your hard disk — the C:\DOS\ folder is as good a place as any to save it. After you've quit Navigator and the PCW CD, double-click on the file to expand it to 16 separate files (if you have chosen not to decompress and save it to your hard disk in one action).

■ **Associating the file:** unless you intend to use DOS to unzip files (laborious and tricky) you need to associate .zip files with PKUnzip. From File Manager, choose File Associate to associate *.zip files with PKUNZIP.EXE. Under Windows 95, zip files will be associated automatically.

April 1997



PCW INTERACTIVE

Entire Contents List:

Multimedia section

- Microsoft Development Network
- OfficeForms (Win95)
- MultiMusic
- Goldmine 3.2 (Win 95)

Games section

- Destruction Derby 2
- Sega Rally (Win 95)
- G-Nome (Win 95)
- Ultimate Soccer Manager 2
- The Settlers II

Arts section

- 32 graphic images from the Image Bank
- Jukebox containing the track *Alive* from Triggerfish

Getting Started

- A beginner's interactive exploration of notebooks, printers and desktop PCs



Personal Computer World

CD Index

- A searchable index of the PCW cover discs since September 1996

Hands on

- Hints, tips and practical advice on every aspect of personal computing

The Room

- A browse through VNU's new redesigned e-zine, The Room

F O L D H E R E

Reference section

- 12-month products and features archivable database
- Advertisers' index
- General info on the CD
- Glossary of PC terms

Software library section

- Including those files referred to in the *Hands On* section of PCW
- Acrobat Reader v3.0 (Win95/Win 3.11)
 - Alicia Silverstone screensaver
 - APOLLO — Mission to the Moon
 - Avery Label templates
 - Cachchk
 - Chess
 - Creative Writer
 - Desktop Deluxe

- Direct X3.0
- Edesk 97
- Flash View
- FreeAgent V1.1
- GPS Software
- Icoholic
- Icons Control 95
- Images Control
- Internet Explorer 3.0 (Win95/NT)
- Kilkenny
- Lottery v4.10
- Magtrakj
- MicroAngelo v2.1
- 3D Movie Maker
- MSIE Cache Explorer
- My Personal Diary
- Netscape Navigator v3.0 (Win 3.x/Win95/NT)
- Odometer Win 95
- Opera
- PAYE-Master
- PDQ Lite

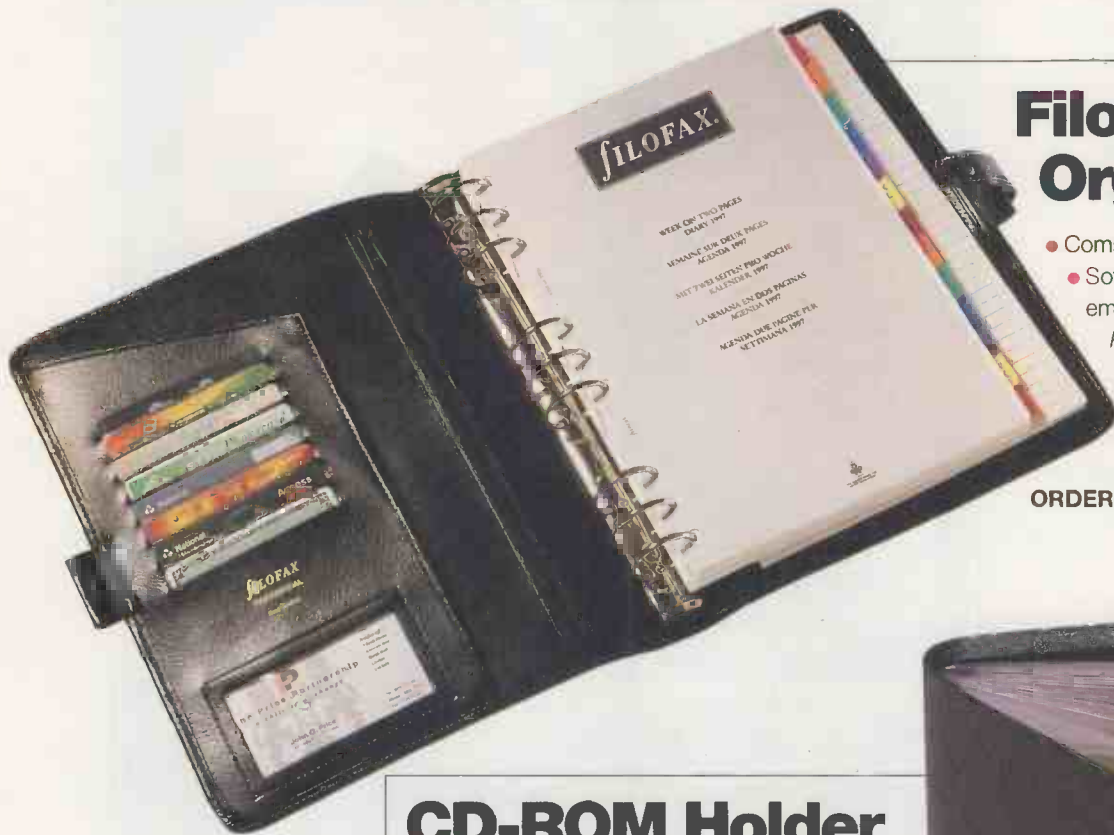
- Pegasus Mail for 16- and 32-bit
- PKZIP & PKUnzip
- Ponger
- PSP v4.12 (Win95)
- PSP v3.11 (Win3.1)
- Quake v1.01
- Quack
- VBRUN 100, 200, 300, 400.dll
- VETLite 3.11
- VETLite 95
- Video for Windows
- VistaCalc Spreadsheet
- *What PC?* — mobile pages buyers' guide for Psion 3a incl the new Nicholson London Pages
- Wincode
- Win95 PowerToys
- Win95 service pack 1
- Winzip
- Word Game

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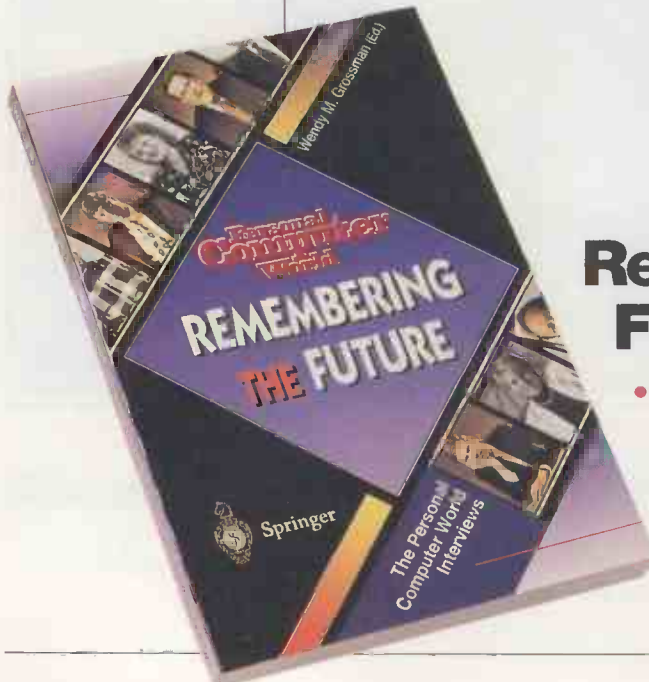
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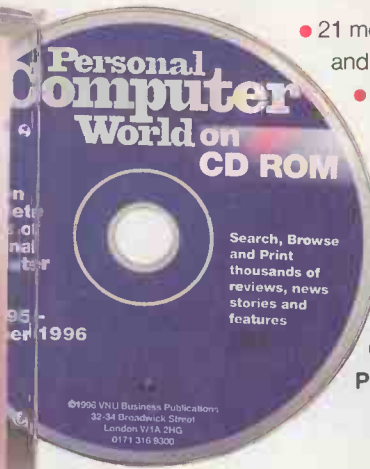
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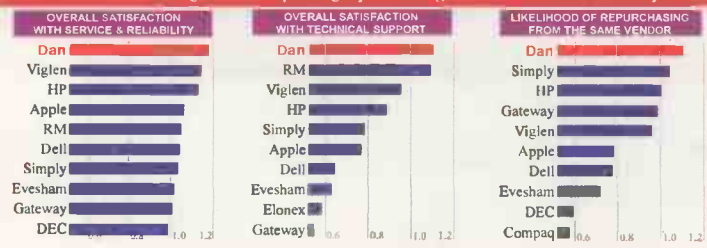
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And which Fileserver was voted as the Runner-up Fileserver?

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June 96



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April 96



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Buy
March 96



danum Home/100
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February 96



dan Ultimate/166
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This machine's overall value and performance wins it
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dan dantum 95/100, Gold Award, PC Plus, April '96



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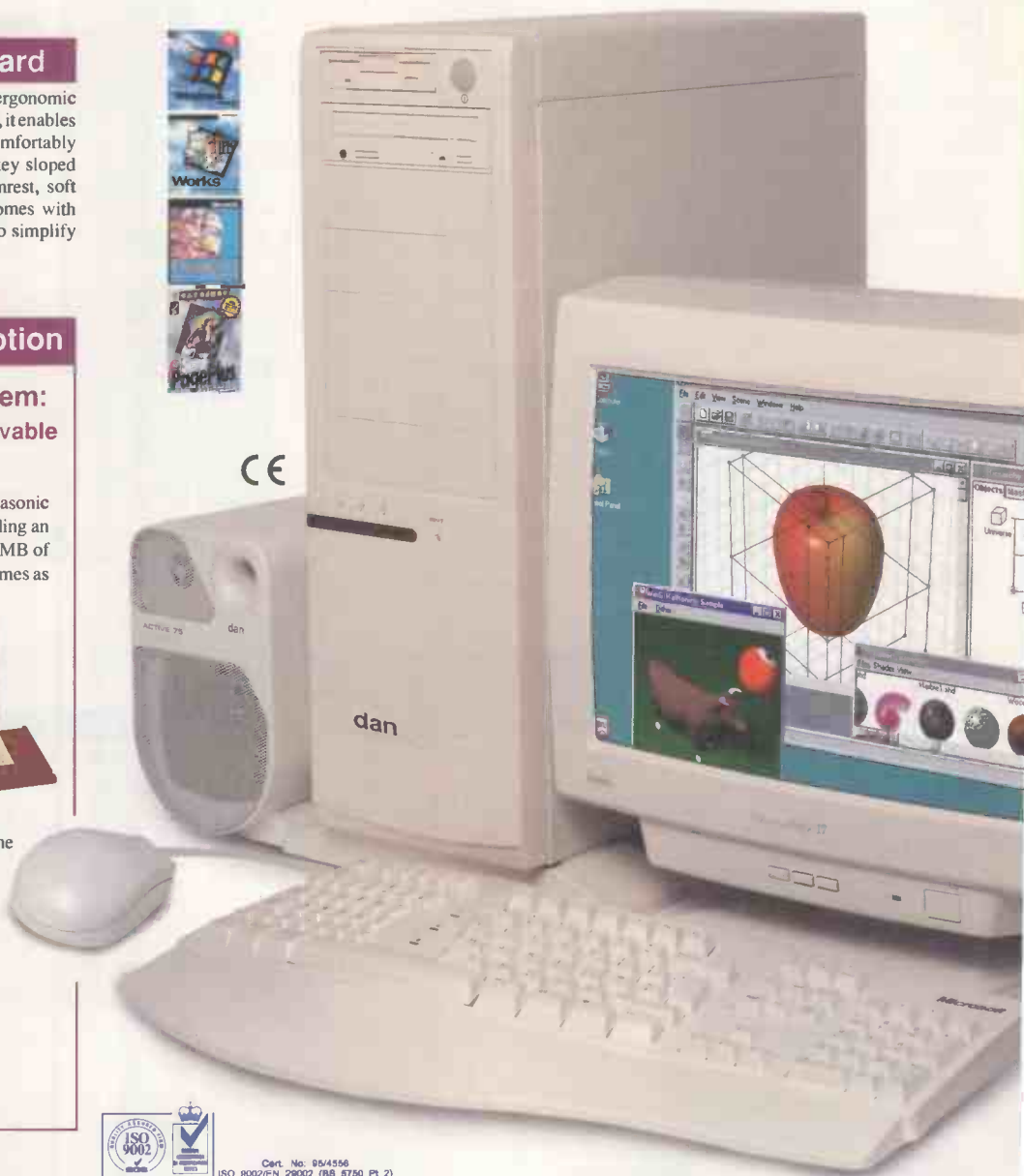
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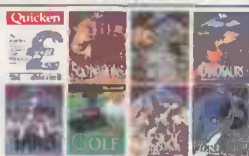


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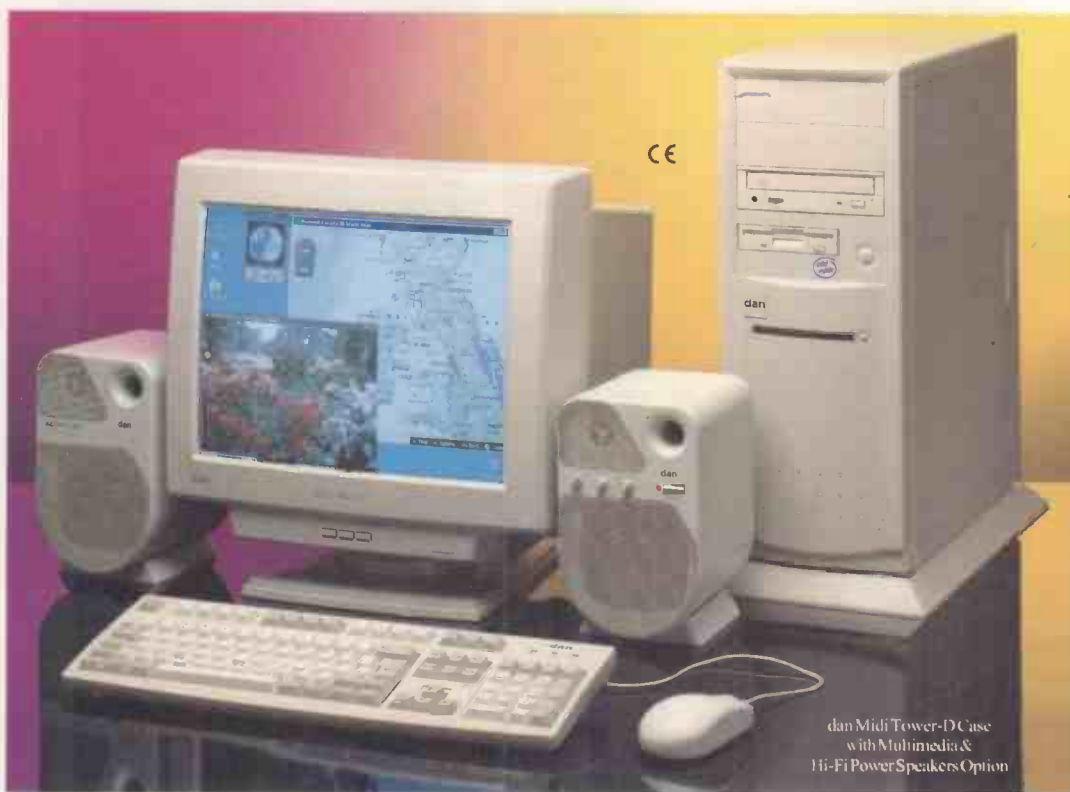
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Personal Computer World

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"Perhaps the most important area of our survey is the analysis of Customer Satisfaction with technical support, system reliability and repairs. For the 4th year in a row, dan has won the overall satisfaction scores. This result is made even more remarkable when you think that it actually raises customer expectations further, so meeting them becomes harder and harder. Congratulations to dan for winning the desktop category." PC Magazine Aug '96 Service & Reliability 1996 Reader Survey

Further dan technology adverts can be found on pages 341 to 345

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Newsprint

MMX upgrade chips on sale

Intel has launched MMX upgrade chips for 100MHz, 90MHz and 75MHz PCs.

They boost chip speeds to 166MHz, 150MHz and 125MHz respectively, as well as supporting MMX multimedia features.

The new 100MHz MMX overdrive chip costs about £311; upgrades for the other two speeds will cost about £250.

● Intel chief, p34

Boost for LS superfloppy

The chances of the LS-120 drive, aka the a:drive, replacing the floppy drive rose last month when Fujitsu and Siemens Nixdorf announced they would fit it in PCs.

Some Compaqs already use the drive which reads standard floppies as well as 120Mb disks.

The case for the LS-120 will be unanswerable if big sales drive down prices — already below £100 in bulk.

● See also, p38

Fourfold confusion as first x2 modems ship

Modem buyers face months of confusion with at least four technologies offering double-speed downloads — and not one is a standard.

The rival devices all run at 56Kbps only downstream from compliant service

providers — not upstream, or modem to modem. US Robotics was first to announce a 56K technology, called x2, last year. PCW has just received its first x2, a Sportster Flash, for review but it requires a flash upgrade to work at 56K.

Pipex, which like most UK

service providers says it will support USR, has also yet to upgrade its system to 56K.

USR claims a big advantage in that its later models are software upgradeable to 56K.

Rockwell, which sells most modem chips, is about to ship models based on its K56Plus technology. AT&T spin-off Lucent is due to ship its own



These two icons put the 56K modem debate into perspective. One shows a DirectPC satellite link capable of downloading at more than 800K. The other is a standard upstream phone net link.

It's the kind of interactivity that will soon become commonplace as digital TV satellite channels go live and cable companies respond with cable modems and boxes. So by the time a 56K standard is agreed, it may already be out of date.

Newsprint will be taking a closer look at these technologies next month.

● Smart NC links, p34



Cover story

Peter Gabriel's *Eve* CD won the prestigious Milia Gold multimedia award in France last month. See p41

V56Flex models.

Motorola, Rockwell and Lucent have agreed to merge these into a fourth design, called K56Flex, by summer. Earlier models are likely to need chip swaps. K56Flex is believed to offer uploads at up to 45K compared with USR's 33.6K.

The US industry will distill yet

● Continued on page 32

First net bank faces doubt over ActiveX factor

The Royal Bank of Scotland has become the first in the UK to announce banking over the web.

When the service goes live in the spring, users will be able to print out account details going back six months, view standing orders and direct debits, and pay bills to more than 750 large companies. But doubts about security were expressed almost as soon as it was launched.

Hackers from the Chaos Computing Club of Germany showed on TV how Microsoft's



Active X technology can be used to rifle home users' bank accounts. Microsoft has long

said that if you want ActiveX power there is a security risk, and you should accept only files bearing encrypted security certificates.

The Royal Bank guarantees to refund any money lost by customers who have used the service and kept their passwords secret. It already offers the same guarantee to its telephone banking customers.

In the long term, internet banking is expected to cost banks a fraction of conventional branch banking. But the Royal Bank plans to charge users £1.50 a month for using the service. One other catch is that you are tied to using the Microsoft Explorer 3.0 browser.

Ben Tisdall

www.royalbankscot.cop.uk

● See News Analysis, p43

Edited by Clive Akass. Send your news and views to news@pcw.vnu.co.uk

Daily Mail stablemate acts as conduit for internet smut

A sister company of the *Daily Mail*, scourge of all sinners and arch upholder of family values, is acting in effect as a conduit for pornography.

Parent company Associated Newspapers has set up a web search



UKplus

engine called UK Plus, one of a new breed aiming to provide local information for UK users. It is well designed, with sites concisely reviewed by journalists, and makes a point of vetting out smutty pages.

But next to the UK search button is one for UK Plus's partner, the US search engine Infoseek, which can act like a pornographic hotline, negating the whole point of the vetting. A search on any smutty word provides a string of pornographic sites, the home pages of which include a stream of obscenities obviously aimed at attracting hits.

Infoseek says it vets its listed sites and so must be aware of their content, though it does not go as far as rival Excite, which



even carries adverts (above) for a pornographic search engine.

Web watcher programs like Cybersitter can stop smutty searches, but there is no easy way for a search engine to do so without blocking non-sexual discourse.

Ironically, UK Plus's own local searches show that much can nevertheless be done. Executives at Associated Electronic Publishing, the newspaper group's online arm, reacted indignantly to the suggestion that they are channelling smut.

Mike With, UK Plus editor, said no other engine was so careful to avoid porn and he was proud to be associated with Infoseek because of its quality of service.

But he added: "We have no control over Infoseek policy."

Clive Akass

UK Plus www.ukplus.co.uk

Porn ad carried by Infoseek rival, Excite



Short Stories

Fast CD recorder

Yamaha says its CDR400 CD recorder is the world's fastest. It writes at four-speed, reads at six-speed, and costs £450 (ex VAT) complete with a 2Mb buffer.

Yamaha 01908 366700

PowerPC NT blow

Microsoft has stopped developing NT for the Power PC, it said last month. This means the MacOS and AIX will be the only operating systems supported until Apple's NeXTstep-based Rhapsody appears.

Apple exodus, p34



This £115 (ex VAT) device from Lindy transforms your PC monitor into a TV.

Lindy 01642 765275

Disastrous news on the joke of the millennium

Time was when the millennium was linked with the Second Coming, hellfire, and Judgment Day. But the Year 2000 bug — code that counts dates only up to 99 — seems to have shifted the focus of fear from the apocalyptic to the algorithmic. Latest predictions include:

- US missile systems will fail.
- UK military systems may go the same way, even after a £100 million bug-fix programme.
- Planes will crash as satellite positioning systems go awry.
- Nuclear power stations will get catastrophically confused.

Oh yes, and if you survive that lot, you can look forward to a collapse of world IT systems leading to a global slump, says a new book called *The Millennium Timebomb* by Simon Reeve and Colin McGhee (Vision Paperbacks, £8.99).

Yet IT managers are having trouble getting extra funds to deal with the problem, according to a Year 2000 report from Softlab. Finance directors tend to blame the bug on IT managers, who are asked simply to redirect existing funds to sort it out.

Vision 0171 460 4684;

Softlab 0181 742 2277



'He reckons he's the fifth horseman of the Apocalypse. The first four brought war, death, famine and disease. He helped code the Millennium bug.'



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Buyers sniff rip-off in extended warranties

PC buyers are getting wise to the dubious value of some extended warranties, judging from a new report. But they are still paying twice as much for cover as continentals.

Charges at high-street shops can be nearly five times German rates, says the Inteco report. It singles out Dixons and Currys, where warranties cost respectively as much as 9.4 percent and 11.5 percent of the system price. The UK average is 5.5 percent.

Yet three out of four buyers have no problems in the warranty period — and problems that do occur tend to be software related, says Inteco. As a result, seven in ten second-time buyers refuse extended cover. And many are voting with their feet by buying via ads rather than from shops, Inteco senior consultant, Pete Day, warns.

"Certain channels are

Country	Cost	Period
France	2.7%	1.8 years
Germany	2.2%	1.6 years
UK	5.1%	1.8 years

Average percentage cost and period of extended warranties

very good at persuading neophyte PC buyers to take out an extended warranty on their PC, but they can't rely on this forever. Less than 50 percent of the people buying home PCs are doing so for the first time," he said.

Buyers are right to balk at buying extended cover, says the government-funded National Consumer Council. They have wide legal rights to redress if faults occur in a

"reasonable period".

Beyond that, "cover under an extended warranty often stops just short of the point where a machine is likely to start going wrong," a spokeswoman said.

Dixons said in a statement that its Coverplan, also sold at Currys, PC World and Link stores, offers unmatched benefits. "It is impossible to compare a warranty in the UK with one in France and Germany without knowing what level of service is offered," the statement added.

Inteco 01483 751777

NCC 0171 730 3469

Cherry ripe for reads

Cherry's latest keyboard includes a built-in reader for barcodes and magnetic swipe cards, so you can swipe someone's identity card to ensure they don't swipe your money.

Cherry 01582 736100



Domino knocks spots off the rest, says Lotus

Lotus's new Domino package (reviewed on page 114) provides almost all the internet and intranet functions needed by Notes users,



Lotus Development president, Jeff Papows (pictured, left) told the first European Lotus-sphere Conference here. But two products due soon, codenamed

Lookout and Maui, will be additions to the Notes client.

Lookout will feature an updated and enhanced user interface and navigation "paradigm" that will integrate web products such as SmartSuite 97, Microsoft Office 97

From DYLAN ARMBRUST in Nice

and Internet Explorer. It is expected to ship in the late half of 1997. Maui will be the follow-on Notes client that will support a raft of new internet protocols, including IMAP4, LDAP, NNTP, IIOP and ICAP. Papows said this further enhancement was a continuation of Lotus's support of open standards-based clients.

Lotus also seems to be jumping firmly on the Java bandwagon with a preview of Kona, a set of Java-based applets designed for use over the web on a Network Computer (NC). There will be a full "suite" of applets, ranging from a word processor to

presentation graphics, all with core application functionality to run on any Java-based browser, whether it's on a LAN, WAN, or internet based network. However, Lotus will continue to develop and enhance its full-featured application, SmartSuite.

Papows said that Lotus, in conjunction with its parent company, IBM, was refocusing on a network-centric strategy and that it planned to aggressively go head to head with Microsoft.

"Lotus has not been the *tour de force* that Microsoft has historically been" but Lotus/IBM "will spend WHATEVER [his emphasis] it takes" to keep and extend their lead in groupware, particularly in R&D, he said.

Short Stories

Mosaic browser owner Spyglass thinks small

■ Spyglass was the company that bought Mosaic, the mother of all graphical browsers, from the National Centre for Supercomputing Applications. The NCSA has just announced that it has stopped all browser development, as it can't compete with Netscape and Microsoft.

So whatever happened to Spyglass? Well, it owns part of Internet Explorer, which is based on Mosaic. And it is busy developing browsers for non-PC web devices. Now it has bought in former Palindrome exec, David Harris-Evans, to head up a new operation in Europe where he reckons there is a "huge potential for embeddable Web technology."

● New Acorn mini OS, p36
Spyglass 01753 705003

Netscape still leads

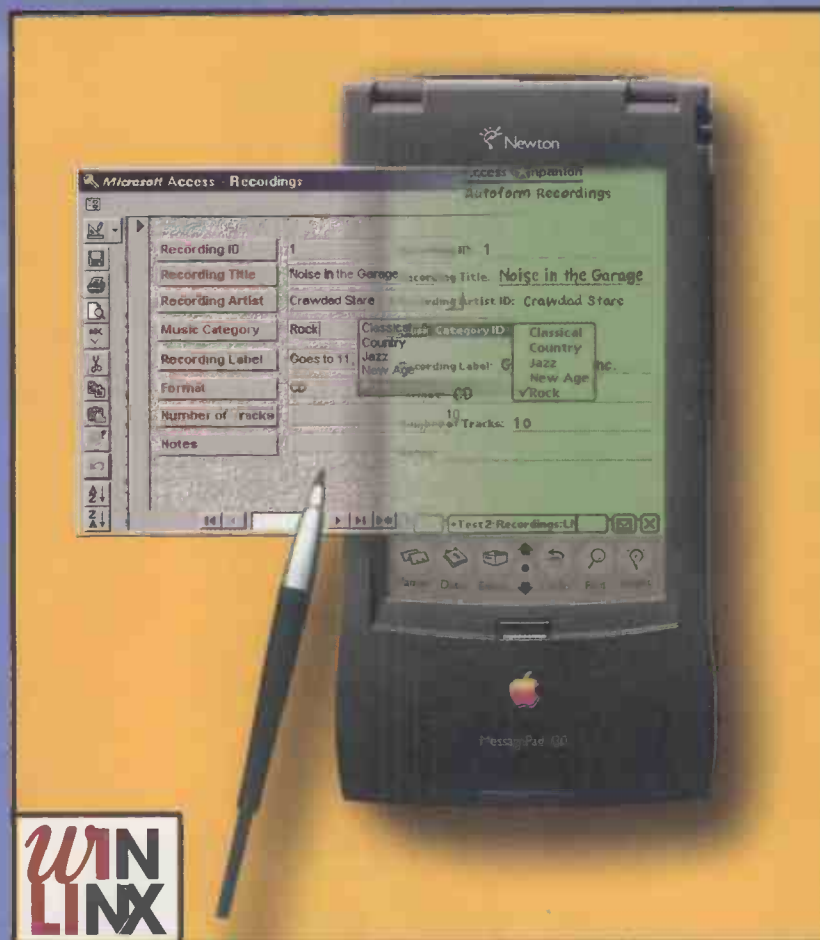
■ Netscape Navigator is still by far the most-used web browser. But Microsoft reckons its Internet Explorer is catching up fast, with a share of users rising from 8 to 28 percent in the last four months of 1996 alone.



4Mb palmtop

■ Hewlett-Packard is offering a £450 (ex VAT) version of its 200 LX palmtop with 4Mb RAM.
Hewlett-Packard 0990 474747

MOBILISE YOUR OFFICE

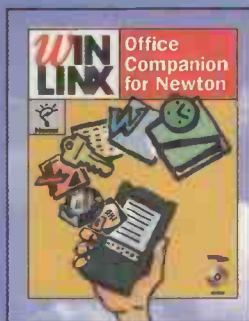


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RAM market steadies after prices Korea out of control

The cost of memory chips jumped by more than 25 percent in two weeks last month after a year which saw prices fall by up to 80 percent. The rise followed a decision by South Korean manufacturers, who account

for 35 percent of the market, to cut output by around a third in a bid to push up prices. Prices levelled off but industry watchers are divided on the long-term view. US analyst Dataquest predicted further falls this year of up to 30 percent.

But Lianne Denness, MD of vendor Hypertec (see left) thinks prices will stay steady for a while and then rise slowly.

Prices of whole PC systems will be little affected unless there are dramatic RAM price

risers. Small increases would be offset by Intel's regular processor price reductions.

The global glut of chips that pushed prices down is being eroded by a higher demand as users find RAM upgrades are the cheapest and best way to boost performance: 32Mb RAM is now regarded as *de rigeur* for MMX and NT machines.

Vendors in Europe last month waited anxiously to see if the EC would reimpose anti-dumping tariffs after an 18-month suspension due to end on 7th March.

John Byrne, of Vanguard, was hoping for tariffs to be imposed as they vary according to source, and his Taiwanese suppliers would not be affected.

Vanguard 01604 859542



Free memory insurance

Hypertec is offering free theft insurance on its Retrieve memory chips which are tagged to identify the owner. Stolen chips will be replaced within a day. Hypertec 01488 686844

Micrografx hits two suite spots

■ The message from Micrografx was clear: its new high-end graphics software packages are not meant to compete with Photoshop. It is interested less in the professional graphics market than in corporates where "Graphics Suite has been designed to work with Office 97," said David Whitewood, UK general manager.

However, the positioning of the products is not clear. A new web suite offers the same components as Graphics Suite 2.0 (now shorn of its ABC tag) less the enhanced FlowCharter, but costs around £140 less. Both include Picture Publisher 7, Designer 7, Simply 3D 2 and Media Manager 2.

But both packages contain advanced features. Vector graphics can be transferred to the web from Designer and 3D animations can be converted to animated GIFs from Simply 3D 2. VB scripts can be applied to objects created in Designer and used to create mouse-over events on web pages.



FlowCharter 7 now includes "living flow charts" where dynamic events can be programmed into the boxes on a flowchart, again using VB script. For example, a flow chart could be created that walks users through telephone canvassing procedures.

Micrografx also announced Small Business Graphics and Print Studio, designed to make stationery creation easy. Paul Fisher

Micrografx www.micrografx.com

Tim Bajarin reports from the US



■ The days when AST was a top five PC vendor are long gone. It has slipped out of the top 10 with a market share hovering about one percent.

Samsung bought a one-third share of the company and put in \$350 million in late 1995, which kept it solvent. With AST still in trouble, Samsung brought its share up to 49 percent and demanded six of the 10 board seats. This still did not help.

Now Samsung has offered to buy the rest of the company for \$465 million. It could gain control with just two percent more, but that is not the way Asian business minds work: control means 100 percent and no less.

Samsung could also have just walked away, but that would be admitting failure. Instead, it will put more money into AST to save face.

Ironically, AST management has not decided if it wants to sell and has passed the decision to an internal committee – though Samsung, with a majority on the board, has the final say. But AST has had another cash infusion and will be around for at least another year.

■ Systems using the new multimedia-enhanced MMX chip are already on the market in big numbers. The big news is that Intel has priced the 166MHz and 200MHz chips reasonably and PC vendors are following suit.

Hewlett-Packard and Sony are both offering the following system for \$2,399 (£1,500): 32Mb EDO RAM, 4Gb hard drive, 33.6 modem, 16x CD-ROM, 256Kb pipeline burst cache, 2Mb video RAM, accelerated 3D video graphics, MPEG 1 for full-screen digital video, 3D, SRS surround-sound with subwoofer, phone answering system and two universal serial bus ports. Add the MM video monitor, and the whole system goes for \$2,899.

The aggressive pricing shows Intel is serious about getting everybody on to MMX as fast as possible. Prices are higher outside the US, but here they are so low that researchers think upgrades and new purchases should put PC sales growth at about 18 percent in 1997.

Short Stories



Micro Solutions has come up with a device to fill that nasty storage gap, while we all wait for DVD-RAM to happen.

The Backpack PD/CD acts like a hard drive, a backup device and a CD-ROM drive and uses rewritable optical cartridges, which should work in next year's DVD drives.

Prices, with sound card, start from £539 (£438.72 ex VAT).

www.micro-solutions.com

Micro Solutions 001 815 756 3411

Lynley Oram

Class act for screens

Keyzone is selling a range of Clasnet systems which allow teachers to scan all students' screens or project one screen on to all of them. The systems also allow a teacher to take control of a student's keyboard or mouse. Prices start at £895.

Keyzone 0181 900 1525

Samsung keyboard

Samsung has replaced the aluminium keyboard backing on the SensPro 500 with a steel backing. This should stop the keyboard bending when you type, as in the model we review this month (p203).

Pace modems

The contact number for the Pace ISDN terminal adapter in last month's Issue should have been 0990 561001. We apologise for any confusion.



Sanyo packs sound bytes

Sanyo's new Flashback Mobile Office digitally records up to 35 minutes of sound into flash RAM which it can then pack into 2Mb of disk space. The sound can be randomly accessed, speeded up with no change of tone, and sent

efficiently over the net. The £399 (plus VAT) kit has three modules, each available separately: a recorder and memory (left), and a PC Card that downloads the memory to a laptop or PC (right).

Sanyo 0500 368080

Users face 'wait and see' game on 56K

Continued from page 26
another spec out of all this, which may or may not be made an ITU standard next year.

Hayes, Motorola and Microcom (which has just launched a nice-looking £140 33.6K voice modem) are all offering upgrade deals on modems bought in the meantime.

There are doubts whether any will work in practice. James Gardiner of Demon, the only major UK provider not to have backed USR, advises users to wait and see.

"We are not going to commit to a technology until we are sure it works," he said.

Bill Pechey, chief technology officer for Hayes Europe, also warns users to check what a provider means by x2 support. "It could be just a single 56K line."

Clive Akass

Hayes 01252 775500;
Motorola 01628 39121;
Microcom 01483 242800;
Demon 0181 371 1234;
Pipex 01223 250100;
Satellite Digital Systems (dealer, Direct PC) 01494 455466

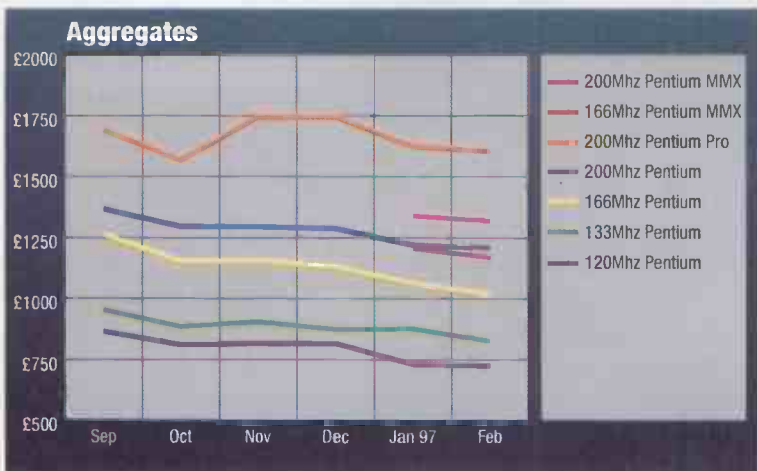
Power bug in CE handheld

One of the new Windows CE palmtops has a problem which could lose data. Casio's Cassiopeia, due to ship here in July, does not power down properly when switched off.

All data is stored in RAM and so is vulnerable to loss of power. Casio technical support person, Scott Nelson, said Microsoft was addressing "a problem with power management."

A software patch was due to be posted on the Casio web site.

VNU Newswire



PCW price check



These charts, based on average prices from major vendors, show the downward trend of system prices since last October. Some of the dips are due to fluctuations in memory prices. Intel also reduces some processor prices as it introduces faster versions. Over the next few weeks we will see the effect of MMX on prices of older Pentiums.

Chart based on figures supplied by Dan, Viglen, Mesh, Dell, Evesham and Carrera. Not all supplied all configurations for the whole period.

SYSTEM DETAILS: 120MHz, 133MHz prices include 1Gb disk, 16Mb RAM and 14in mon; 166MHz, 200MHz Pentium and Pro same with 15in mon; MMX machines, 2Gb disk and 15in mon.

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Intel parades its NC paranoia

You'd think a company which made \$5.2 billion last year has little to worry about. But Intel is led by Andy Grove, whose motto is "only the paranoid survive", and he paraded his fears across Europe last month.

First he feared that Europe is falling behind in internet usage, a concern not unconnected with a wish to sell more chips here.

Then he was worried about

the ease and cost of administering networked machines, and outlined a series of Intel answers.

This clearly had everything to do with the much hyped advantages of the network computer, which incidentally does not depend on Intel chips.

There was a curious subtext, spelled out in a *Fortune* article distributed to an invited audience of press and IT managers in

London: we all need Intel to win.

The argument has force. Intel spends billions developing new chips and setting up chip fabs. Each generation finances the next, so if sales falter, so does R&D.

Moore's Law, which has computing power doubling every 18 months, could break

down if everyone decided not to buy, say, MMX chips. That is, we might never get to play with the 400MHz Pentium Pro Intel showed off in San Francisco last month.

Clive Akass



Siemens backs Wintel as Lotus lauds smart NC

Two giant companies straddled the network computer battleline last month. Siemens Nixdorf plumped squarely for the Wintel camp by announcing a strategy called user-centred computing based on Microsoft software, with its new emphasis on easy, low-cost administration.

It also announced a NetPC based on the cut-down PC that is Wintel's answer to the pure NC.

Meanwhile in Nice, IBM-owned Lotus was evangelising the Notes-powered intranet (see p29), and showing an NC prototype good enough to impress PCW's Dylan Armbrust.

Lotus reckons we will all carry around smartcards that allow any NC from Tooting to Timbuktu to download our familiar desktop. Goodbye notebook. Goodbye PC.

Far fetched? Well, I've been playing with a DirectPC satellite link that could download my system in the time it takes me to boot from disk.

The smart NC may not mean the death of the PC, but it shows why Microsoft and Intel have the jitters.

Clive Akass

Lotus 01784 455445;
Siemens Nixdorf 01344 862222;
DirectPC 01494 455466

Mac execs leave and prices drop as founder Steves return

Key Apple executive Heidi Roizen resigned last month as Steve Wozniak joined co-founder Steve Jobs back at the troubled company.

Roizen, aged 38, was in charge of maintaining relations with software

developers who are vital to the company's future. She insisted that her departure had nothing to do with events at the company. "I want to spend more time with my children," she said.

Three other executives also quit, reportedly victims of a top-level reshuffle.

CEO Gil Amelio evidently hopes the two Steves will revive Apple's early flair, but the exodus will

do little to cure a crisis of confidence after poor sales figures (see below).

Apple cut the prices on its flagship PowerMac range by up to 25 percent, as new models were announced. And Motorola cut its MacOS-model prices by up to 33 percent and announced three new models, with the entry-level StarMax DT3180 starting at £869.

IMC, UK distributor for Mac cloner Umax, countered by bundling the Freehand Graphics Studio 2.0 suite with all its models.

Apple 0181 569 1199; Motorola 01628 39121; IMC 01344 872000



Now for the good news... Apple's latest PowerBook 3400 uses a fastest-*yet* 240MHz 603e PowerPC chip, built-in ethernet and modem link, hot-swap expansion modules and a four-speaker sound system

Falling Apple sales highlight gravity

Apple has for the first time in five years dropped out of the top five for US sales on Dataquest figures for the final quarter of 1996.

But it ranked fifth for the whole year, with 6.7 percent of the US market — down from 11.1 percent in 1995. Compaq stayed at number one with 1.03 million sales over the last three months

US % market share last quarter

1	Compaq	13.7
2	Packard Bell, NEC	10.6
3	IBM	10.2
4	Dell	7.1
5	Gateway	6.8

and 3.4 million in all 1996.

Compaq also led world sales in 1996, with Apple in fourth place at 5.2 percent — down from 7.9 percent.

Much of Apple's slide was

due to a lack of customer confidence, which CEO Gil Amelio highlighted in his Mac World keynote. Many corporate Mac sites have switched over to the PC and Windows 95 or NT rather than new Macs.

But Mac clone sales have risen and some analysts predict a rise to 500,000 this year.

Tim Bajarin

Plug-in box frames future of video-editing appliances

A home-video editing suite shows a new direction in the convergence of computing and television. The £290 (inc VAT) Studio 2000 package from newsroom video specialist Pinnacle Systems comes with Gold Disk's VideoDirector package which Pinnacle bought last year for \$4.5 million.

But the bulk of the video processing is hardwired into a modem-size box that plugs into the PC parallel port — no need to mess with expansion cards. Custom chips (ASICs)

in the box contain a range of titling and transitions developed originally for systems costing up to \$100,000.

You plug a video recorder and your camcorder (or a second VCR) into the box and the PC acts only as a controller, marking the start and stop positions of the edits and the transition type.

This is not as fast or as flexible as systems that store the video digitally on disk, but it does mean that you can use the system on a low-spec PC — a 486 with 4Mb of RAM and minimal disk space. Pinnacle plans a version using the fast 1394



serial port when that is generally available. And the hardware does not need to be in a separate box, so Pinnacle is talking with manufacturers about putting its ASICs into video recorders or camcorders which would plug directly into a PC (or PC/TV) via 1394.

UK vice-president, Brian Connor, said: "Most of the cost of ASICs is in research and development and we have recovered most of this selling our professional systems. That means we can now offer the chips at a price low enough for the home market."

Pinnacle 01895 442003

Time for a change: a Pinnacle transition in action



Mediamatics takes a hard line on DVD software playback

Two Microsoft alliances have also staked their claim on the future of PC video. Matrox has licensed to Microsoft technology to extend the Windows ActiveMovie 2.0 programming interface into the professional market.

The enhancements could help speed the defection of high-end video products from Apple to NT.

The second alliance is with Mediamatics, which will bring MPEG 2 playback from the emerging Digital Versatile Disk (DVD) technology. This



will in theory allow software-only playback. But Pier Frate (*above*), Mediamatics' VP of marketing, said that even MMX Pentiums are not fast enough for a full-quality display, for which an extra chip costing about \$35 would be necessary.

Mediamatics' DVD Express audio and video players are already available to manufacturers from Surrey-based Britcomp. But Frate warned that copyright rows were likely to delay DVD for some months.

● Matrox has cut the price of its Mystique accelerator by 25 percent to £109 (ex VAT) with 2Mb of RAM or £139 with 4Mb. Video capabilities can be enhanced with the Rainbow Runner plug-ins.

Matrox 01793 614007

Britcomp 01932 347077



Luxury screen

Viewsonic will launch this 14in active-matrix monitor at Cebit next month. Maximum resolution is 1024x768 at 75MHz refresh. Yes, we want one too, but these devices don't come cheap. Most are sold

to City dealers with more money than desk space. **Viewsonic 01293 643900**

Smoke signals

More than 1,000 stylish ways to get cancer can be found at www.cigaraficonado.com. The eponymous US cigar magazine claims to have a 400,000 circulation worldwide.

Short Stories

Psion buys customers with real gold

Psion Dacom has come up with a nifty way to push its latest PC data card: the first 25,000 off the production line have been plated in real gold.

The Gold Card Global fax/modem card, configured for V.34 modem operation, has PTT approval in twenty countries and optional support for most handsets, including Nokia, Panasonic, Alcatel, AEG, Matra and NorTel.

All GSM networks from 900 to 1900 are supported and there is 2Mb of flash memory to ease upgrading. Prices start at £209 (£245.58 inc VAT), Nokia upgrades cost £159 (£186) and other GSM upgrades are priced at £139 (£163). **Lynley Oram**

Psion Dacom 01908 261 686

IT departments ignore Monetary Union

The political storm over European Monetary Union has not alerted UK businesses to the impact the scheme will have on IT systems — whether or not Britain joins. Fewer than four in ten (38 percent) have begun preparations, according to a Micro Focus survey of delegates at a recent seminar. Nine out of ten could not say how long it would take to EMU-enable their systems, but estimates that were provided ranged from 15 months to five years.

Micro Focus 01635 565272

Short Stories



■ Bannerbridge says its £1,095 Signature is a fast and cheap way to print designs on CDs. Bannerbridge 01628 419101

Cut-price notebooks

■ Morgan's is selling 120MHz Pentium Fujitsu Lifebook notebooks with an 810Mb disk, 8Mb RAM and a six-speed CD for £1,100 (ex VAT). Morgan 0171 255 2115

Get a-life

■ The Cyberation artificial life engine featured on Notting Hill's Evolution of Life CD can be downloaded from www.nottinghill.com/cyber

New Acorn mini OS

Acorn and has announced a new operating system targeted at the next generation of smart appliances.

The Gallileo OS will compete with the likes of Psion, Microsoft and Diba for a potentially huge market as smart appliances, ranging from email phones to web TV, challenge PCs as the most common computing devices.

Microsoft's Windows CE is an attempt to establish the Win95 interface in this area. Psion is working on a 32-bit version of its EPOS operating system

Gallileo will run initially on RISC processors from

Acorn sibling ARM. But spokesman Kevin Coleman said it will port easily to other RISC processors. "We are not going to be precious about this. We will use anybody's chip," he said.

Gallileo includes a quality assurance function which

guarantees system resources to critical tasks.

● Toshiba has developed a Java operating system called JVOS for Intel-based PCs. It will be available in the autumn.

Acorn 01223 725000;

Toshiba 01932 828828

Cold and Husky

Husky's new FS/3 PC is powered by a 25MHz 386 chip but that is plenty fast enough for the kind of data entry and collection tasks for which it is designed. And it will perform them in conditions in which your PC would turn on its back and die.

Husky 01203 604040



nCipher promises fast secure sales for web

CAMBRIDGE start-up nCipher's prototype encryption product caused quite a stir at the recent RSA Data Security conference in San Francisco. Fastness, brainchild of brothers Dr Nicko and Alex van Someren, promises 300 secure transactions per second, putting paid to the joke about RSA standing for "really slow algorithm" (the acronym actually stems from Rivest, Shamir and Adleman, who devised the notoriously slow RSA public key encryption algorithm).

Marketing director Carol Attack said the firm has had very promising talks with banking and mail-order companies. "Things are looking very exciting and shortly we will be issuing test products of the Fastness hardware accelerator to financial institutions and companies whose businesses involve transactions across the internet."

Fastness is a low-priced add-on board for servers which accelerates RSA computations needed for SFL and SET transactions on the internet. Encryptions involve unhackable 1024-bit numbers and a typical unaccelerated server manages

Fen Watch

Caroline Swift continues her reports from Silicon Fen

just 10 a second — a claimed 30 times slower than Fastness.

"By having our product plugged in, companies are able to offer secure services and at the same time know they are not slowing down the server," said Attack. nCipher is exhibiting Fastness at Infosecurity at London's Olympia at the end of next month and is taking on programmers and technical marketing staff (see www.ncipher.com).



■ Also expanding is Sibelius Software which last month collected a British Computer Society IT Award for its music program, Sibelius 7. Here another pair of

brothers, Jonathan and Ben Finn, are partners in a growing empire that includes offices in Los Angeles and dealerships worldwide. They took one of the top awards for what is essentially a word processor for composers. It runs only on Acorns (see developsibeliiwww).

■ PSINet, the second internet service provider to set up headquarters in Cambridge, home turf of UUNET Pipex, claims to speed up links for the small office/home user with the launch of PSILink at the end of February. The interface is suitable for those working from home or remote sales people who want easy-to-use software on unclogged lines.

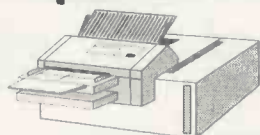
PSINet's lines are monitored closely to avoid congestion and they take advantage of its frame relay network here and in the US. Managing director Valerie Holt says this is particularly good for those contacting the US a lot. "This is not for playing games. It's a robust industrial-quality product," Holt said. Its attractions for the SoHo user include its price of £14.95 per month (www.uk.psi.com).

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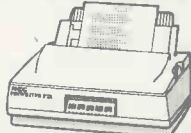
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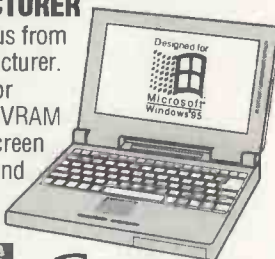


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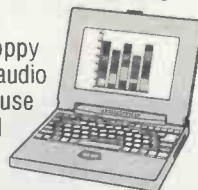
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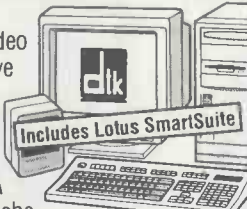
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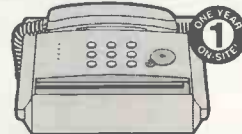
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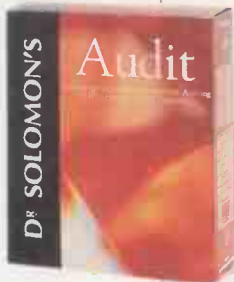
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Short Stories

Solomon gets wiser

■ Dr Solomon's Software has released version 2.5 of Audit, which keeps track of hardware and software on a network. It includes 32-bit scanners for tracking NT and Windows 95 installations. A five-PC starter pack costs £475.



www.natinst.com/uk/



■ UniDirect says its IPconnect package is the first to offer integrated internet access and email for Novell users. It gives a whole network internet access via a single modem, avoids the need for a dedicated internet server, and acts as an SMTP or POP3 mail server and firewall.

Unidirect 01788 552005

AA guide

■ The new MathLab 5.0 for Finance promises advanced computing and analysis tools for finance workstations.

AA 01634 297123

£1000 server

■ Elonex claims its £995 Kayak is the first preconfigured server to sell for under £1,000 (ex VAT). It uses a 166MHz Pentium-class processor, with 512Kb pipeline cache, 24Mb of RAM, an eight-speed CD, a 2.5Gb drive, a 14in monitor and a network adaptor.

Elonex 0181 452 4444

Free NT defragger

■ Executive Software has posted at www.execsoft.co.uk a free, non-expiring version of what it says is the only disk defragger for NT.

Executive Software 01342 327477

Web faxer

■ Message Management is showing at www.faxfromwed.co.uk its new system that lets people with slow modems have pages sent to a fax number.

Message Management
0181 960 2700

Thin drives move battle of the superfloppies onto notebooks

The battle of the superfloppies has shifted to notebooks, where special thin versions of 100Mb Zip and 120Mb LS120 drives are vying to replace the floppy.

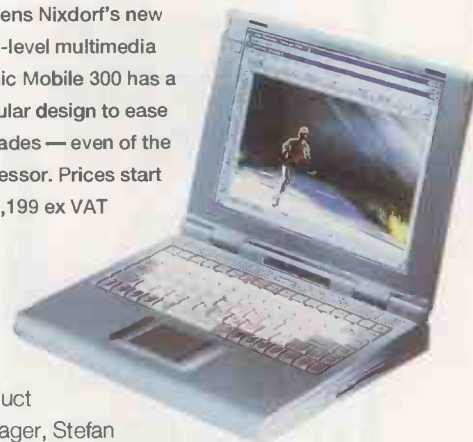
The LS-120, sold by OR Technology as the a:drive, reads and writes standard floppies as well as its own 120Mb disks. The price to manufacturers is now below £100, but the added system cost is less than this because a floppy drive is not needed.

It has received huge backing from Mitsubishi and 3M spin-off, Imation, both of whom are manufacturing the disks. However, the write speed to standard floppies is relatively slow.

Imation's Zip drive is faster but cannot read standard floppies. However, some vendors believe it has the edge because the desktop version is already established.

Siemens Nixdorf, which has launched a new entry-level model for its Scenic Mobile range (right), is testing both devices. Mobile

Siemens Nixdorf's new entry-level multimedia Scenic Mobile 300 has a modular design to ease upgrades — even of the processor. Prices start at £1,199 ex VAT



product manager, Stefan Reister, said no decision had been taken but he believed the Zip would prove more popular. "The Zip has sold millions. It is a de facto standard."

Both drives are bootable provided the host machine has a compliant BIOS.

OR 01491 413663 (Dealer: Ideal
0181 286 5000; Imation 0800 973914



Clock this...

■ This image of a clock in Basle is one of 50 on a £8.50 CD called Beautiful Desktop. All come in nine different screen resolutions for use as wallpaper, but some images are more practicable for this purpose than others. Picking out your program icons from a high-definition picture of the Colosseum in Rome is likely to give you a headache, however magnificent the view.

Price Media 01635 862064

Texas, Olivetti sell off computer divisions

■ Two major manufacturers have offloaded their computer divisions in the past month. Troubled Olivetti sold its PC division to a new company called Piedmont, set up by the Centenary group led by London lawyer Edward Gottesman. The deal, worth about £100 million, will leave Olivetti with ten percent of the new company. Some

analysts fear Piedmont is interested only in asset-stripping but Gottesman claimed the unit can be profitable.

Meanwhile, Texas Instruments sold its mobile division, which makes the TravelMate and Extensa series of notebooks, to Taiwan-based Acer, the fourth biggest PC manufacturer in the world.

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Short Stories



Showing off

■ DIP claims its Showman Pro notebook is the only one available with a built-in overhead projector tablet. There's a choice of 10.4in or 12.in TFT colour screens with 800 x 600 resolution, and an eight-speed CD drive is included as standard. Prices start at £2,300. [DIP 01442 874006](http://DIP01442.874006)

Hard facts

■ Jensen Tools is selling a CD version of the Microhouse Encyclopaedia of Hard Drives, which claims to have details of virtually every drive and controller made for the PC. It costs £195 (plus VAT) [Jensen Tools 01604 787060](http://JensenTools01604.787060)

Name offer

■ CIX is offering personalised email addresses for £30 a year, plus net access charges. They take the form yourname@yourcompany.cix.co.uk. [CIX 0845 355 5050](http://CIX0845.355.5050)

New Visual suite goes way past the Basics

Visual Basic 5.0, the biggest upgrade yet to Microsoft's best-selling programming environment, goes on sale this month. The price was due to be announced at launch day.

VB 5.0 will also be sold as part of Visual Studio 97, a new suite of integrated programming and internet tools — a kind of Microsoft Office for developers. It also includes the latest C++, J++, and FoxPro Visual environments, a library of

documentation, and Visual InterDev, a new system for building database-driven web applications.

Bill Gates will launch the suite, and announce the price, at a training event for developers on 19th March.

Mike Pryke-Smith, net tools product manager at Microsoft UK, said the new suite would help companies build "communications links to business partners and customers" based on their existing IT infrastructure.

New features include native-code compilation, ActiveX controls and improved components: performance is up to twenty times faster than VB 4.0. Users who bought VB 4.0 after 27th January can upgrade free of charge.

■ Microsoft is holding £99 "DevDay" training events in Dublin, Edinburgh, London and Birmingham on 20th, 24th, 25th and 26th March respectively.

[Bookings on 0990 228811](http://Bookings0990.228811)



VB for Psion Workabouts

Developers can now use their Visual Basic skills to build specialist applications for Psion's Workabout range of industrial handhelds.

Psion is now selling Workabouts with its VB-compatible Oval development kit, which allows applications to be programmed on a PC to run on a handheld. Oval programs also run on Psion 3c organisers. VB code can be ported to Oval with the aid of conversion wizards.

Psion, facing its greatest ever competition from the new Windows CE handhelds, has formed a new industrial division to sell machines for specialist applications. Typical applications include data collection tasks.

Workabout prices start at £300. There is a variety of add-ons including a new Wanda barcode reader. [Psion 0171 262 5580](http://Psion0171.262.5580)

Top 10 Windows software

			Last month
1	Win95 U/G with Internet	Microsoft	4
2	MS Encarta 97 (CD)	Microsoft	1
3	MS Off/Pro 97 B/Shef + Mouse	Microsoft	56
4	MS Flight Sim 6.0 (95) CD	Microsoft	2
5	Master Clips 101,000 CD	IMSI	5
6	MS Word Bundle	Microsoft	3
7	PC-Cillin 95	R. Manhattan	12
8	First Aid Deluxe (95&3.1)	R. Manhattan	8
9	Cleansweep 97 v3	Quarterdeck	-
10	Norton AVirus U/G Ins	Symantec	-

Top 10 DOS software

1	System Commander	POW	1
2	Command & Conquer (Red Alert)	Virgin	3
3	MSDOS v6.22 Upgrade	Microsoft	6
4	Total Insanity CD	Europress	4
5	DOS 2 Win95 UG with Inter	Microsoft	10
6	Turbo C++ v3.0	Borland	9
7	MSDOS 6.22 MLP 1	Microsoft	61
8	MacroAssem 6.11 for Win	Microsoft	34
9	Quake Full Release v1 CD	GEM	7
10	Norton PC Anywhere v5 DOS	Symantec	23

Top 10 CD-ROMs

1	Star Wars Trilogy	One Stop	n/a*
2	Beavis and Buttthead Screensaver	Tring Int.	n/a
3	Babylon 5: Limited Edition	Screen Ent.	n/a
4	Star Trek Voyager	Screen Ent.	n/a
5	Empire Strikes Back	Screen Ent.	n/a
6	Encarta 97	Microsoft	n/a
7	Inside Independence Day	Electronic Arts	n/a
8	Cinemanla 97	Microsoft	n/a
9	Music File	File Productions	n/a
10	Kais's Power Goo	Principle	n/a

Top 10 peripherals

1	PNP 16-bit PNP ASOUND	Enta	4
2	Inns 33600 Ext voice/fx/mo	USR	10
3	Primax 4.800 Direct	Primax	5
4	33.6 Int Fax/Modem no Voice	Tashika	-
5	33.6 Int Svoice 2.2	Tashika	-
6	Creative Phoneblaster	Creative	28
7	miro Connect 34	miro	8
8	33.6 Ext with Voice	Tashika	-
9	Evergreen 486/586 Proc UG	Mid	15
10	8x MultiMedia Kit	Tashika	-

Software and peripherals figures supplied by Software Warehouse. CD figures courtesy of HMV Games/Level One. *Information not available at press time.

Vive la multimedia

In France, where PC ownership and CD-ROM sales are increasing apace, the state is backing multimedia to ensure its success, reports Tim Nott.

The French take their culture almost as seriously as their food, so at Milia, last month's international festival of multimedia at Cannes, the Minister of Culture, Philippe Douste-Blazy, addressed press and participants because, in his own words, "it would be unthinkable not to". This is not just politico-speak. Although PC ownership in France is comparatively low, it increased by 150 percent last year and over 3.6 million CD-ROMs were sold. Of these, 15 percent were classed as "cultural" — three times the percentage for Germany. The government is determined to make multimedia a success: "It is imperative that both the wealth of our heritage and the talent of our creators should exploit these new electronic tools," said Douste-Blazy.

Since 1983 it has been compulsory for other media publishers, in addition to book publishers, to deposit copies of published works with the Bibliothèque Nationale (National Library). So there is now a comprehensive national archive of multimedia. In addition, there is the newly founded Médiathèque de l'Ircam which provides a unique collection of documents and media relating to 20th century music.

There is a drive to digitise the contents of galleries, libraries and museums throughout France, forging partnerships between state and independent publishers which has conceived titles such as Montparnasse's stunning virtual reality tour of the Quai d'Orsay gallery. The Bibliothèque Nationale is itself getting digitised, with the long-term aim of making it truly national, with on-line access from local libraries. By 1998, 100,000 texts,

300,000 images and 40,000 hours of sound recording will be available electronically. The Ministry of Culture has its own web site, scoring 5,000,000 hits per month.

The state is putting its money where its mouth is on a number of levels. First, training for budding creators (at the Ircam studio and throughout universities and art schools) will be counterpointed by training for end-users, with local libraries offering practical instruction for new readers of electronic publishing. Second, financial aid: through the Centre Nationale de Cinématographie, 60 projects have already benefited.

Aid is available in the form of loans for multimedia projects, to counteract the banks' reluctance to underwrite the new technology. Financial support is also being offered to exporters, with aid to help in the "localisation" and translation of works into other languages, and grants to attend international trade fairs. On a practical level there are state-funded organisations for authors to simplify the legal issues of publishing and protect their electronic rights, and the formerly cumbersome restrictions on where CD-ROMs could legally be sold has been lifted.

So, analysts who predict gloom for "serious" multimedia in the UK market, take note: it is not for lack of talent or cultural diversity that the UK is lagging. Multimedia is a seed technology, and, as with all seeds, it needs nurturing and watering. Above all, we need to accord it the respect and support it deserves. I will leave the last word to M. Douste-Blazy: "Like our cinema, our multimedia must be taken seriously. If we do not provide aid, then it will cease to exist." ■

Vive les Brits

British culture was not entirely neglected at Milia. Even though it took a US company, Seventh Level, to bring it to market, Monty Python and the Quest for the Holy Grail was joint winner in the games category. It tied with The Pink Panther's Passport to Peril (pictured, right), already awarded a five-star verdict in PCW (March). Boots the Chemist, and Uploaded (the on-line edition of Loaded magazine) were shortlisted for best web site but lost out to the Discovery Channel. In the edutainment category, the winner, Operation Teddy Bear, sounds encouragingly English but is, in fact, a French title. France also scooped the Reference section. But in the Recreation — How-To section, Anglo-French honour prevailed with the English-language CD-ROM magazine, Interactive Wave, from Editions Numeriques. The Art and Culture prize went to the beautiful National Museum of American Art. And the top prize? The Milia Gold? Step forward Peter Gabriel, whose Eve, a joint UK-US production, combines contemporary art, music and technology in an "exploration of the eternal riddle of the relationship between man, woman and nature".



The big fight

It's TV and cable industries versus Microsoft and Intel. The battle for control of consumer access to digital content will be over by Christmas, says Tim Bajarin.

In 1984, when the PC was starting to gather steam, a major Japanese television maker asked me to view a product it had in its labs. As a PC analyst I could not imagine what it was, but I went out of curiosity. My host showed me what must have been the first-ever PC/TV combination. Here, in front of me, was a 21in TV that had in its base a modified 286 motherboard.

The company was very excited about this contraption and asked me what I thought they should do with it. At the time, I was working on a project for a cable TV company to define the role of cable and its potential impact in a business environment. I did not have a clue what the TV people should do with their PC/TV combo, but I suggested that the PC and the TV

might converge in the future and that their chicken had been hatched too soon. As for the cable guys, our final report stated that unless cable could provide two-way access, the business community would have no use for their services. I was reminded of those early days as I walked around the Consumer Electronics Show (CES) and came across various PC/TV schemes, such as those from Web TV and Akai, as well as various cable modems and internet access schemes.

All the major TV and cable firms are now aggressively chasing business and consumer markets with products aimed at bringing consumers into the digital age. Interestingly, this move has become controversial as well as highly parochial. The TV and cable industries would love to control the way home users access digital "stuff". The problem is that integrating a PC forces them to deal with standards and protocols.

So it should come as no surprise that Intel and Microsoft have entered the fray. The day before CES opened, Microsoft officially announced its "reference"

model for a PC/TV. Of course, it is based on the Intel processor and Windows 95. But, like Netscape and Sun, who would like the internet to be based on open platforms, the cable and consumer electronics industries do not want Microsoft and Intel dictating their future, and this is one area in which the two giants are not assured of a dominant role.

If the internet becomes the backbone for delivering two-way interactive entertainment, and Netscape and Sun Microsystems (along with the cable and consumer electronics companies) resist this advance from Microsoft and Intel, the hearts and minds of mass-market consumers will be up for grabs.

In fact, this will be at the heart of a major debate over the next 12 months as each faction tries to move in on the other's territory. Cable and electronics firms are reviewing the Microsoft reference design carefully, but not because they really want to adopt it. Content delivery will be a major part of their role but they will need programmers to make it more exciting and interactive. There is a multitude of x86 programmers who could help them achieve this, but Java is also a strong contender. If the internet is the only broadcasting backbone, Java could provide a powerful cross-platform programming language that makes a PC-based system an option, not the primary digital access device.

I am convinced that this is the year the issue will take prime debating space. The battle for control of how consumers gain access to digital content will be fought and clear winners will be declared by Christmas. If you were thinking of getting a DVD-ROM or DVD player soon, think again: the lack of secure copyright protection is stalling the rollout of these next-generation devices. DVD, digital VHS and digital video recorders are all affected. Without a secure transport scheme embedded in all of them, movie and music companies have been reticent to put any of their content into digital form and make them available for these digital platforms. All parties have agreed on a method of software encryption but the movie and music industries want protection extended to the data paths inside the PC or other DVD devices.

One suggestion is to incorporate encryption into the IEEE-1394 specification for fast serial links (or what Apple calls Firewire). Most PCs will be 1394-enabled by next year, anyway. But these secure transport specifications will take time to finalise, making it unlikely that DVD will make any impact in 1997. ■



Turn it on and it will run: The Apricot MS530 Diamondtron 17 PC/TV system has everything a family could want and comes internet-ready [reviewed in PCW, May '96]

Banking on it

Within three years, most European banks could be providing a full internet banking service. Some are almost ready to go. Ben Tisdall gives an account.

Everyone likes the idea of online banking: the banks because it costs so little, and the customers because they can do it from the comfort of their home or office. A recent survey by Booz Allen and Hamilton estimates that 80 percent of European banks will provide a full banking service on the internet within three years. Another, by ICL/Mori, now expects that 17 percent of people will use PC banking within five years (up from 13 percent the previous year).

The Royal Bank of Scotland's announcement that it will offer internet banking to all its customers by spring has stolen a march on its rivals. While other banks try out proprietary systems, Royal Bank will offer a range of transactions across the net. Customers will be able to review their account details, direct debits and standing orders, pay bills to any of 750 major companies and export account data to a spreadsheet or personal finance package. The service will be free for the first six months, with a fairly nominal monthly fee thereafter.

One of the barriers to net banking has been security. But Royal Bank is so confident that it has solved the problem, it is offering its internet customers a refund of unauthorised transactions provided they have kept their security and PC registration codes secret. But the bank's early move to net banking has tied it to an Internet Explorer-only solution. It says that only Microsoft could supply the 168-bit encryption it needed in the time available. Royal Bank's initiative has left rivals floundering.

Barclays PC banking service, announced last October, is completely proprietary. Users have a customised version of Microsoft Money to dial up Barclays own servers. Bizarrely, Barclays claims this approach will make the service more widely available to those who have a PC and a modem but no internet access. What it is perhaps forgetting is that as corporates hook up to the net with fast leased lines, it will be simple for office workers to log on in their lunch hour and sort out their banking requirements.

NatWest's approach falls somewhere between the two. Its pilot scheme, now with 1,500 personal and 500 small-business customers, opted for internet-compatible software. But the software, Netscape's browser, is a customised version designed to dial in to NatWest servers. TSB's scheme is different again. It offers a service that's available only to CompuServe customers.

So far, the online banking services on offer are limited to viewing and planning finances. The next stage will

involve smartcards. Compaq is predicting that within 18 months every home PC sold will be fitted with one. Acorn, which plans to launch its TV set-top box, the NetStation, in May, will ship it with a smartcard. NatWest has already trialled its Mondex system in Swindon while rival, Visa Cash, is on trial in several countries. In Atlanta, in the USA, 1.7 million Visa Cash cards have already been issued. Two types of card will be available: disposable (like a phonecard) and reloadable. This is how it works: you connect an inexpensive smartcard reader to a PC and then charge the card by downloading electronic cash. It acts like an electronic purse and can be used both in real shops and virtual shops on the net.

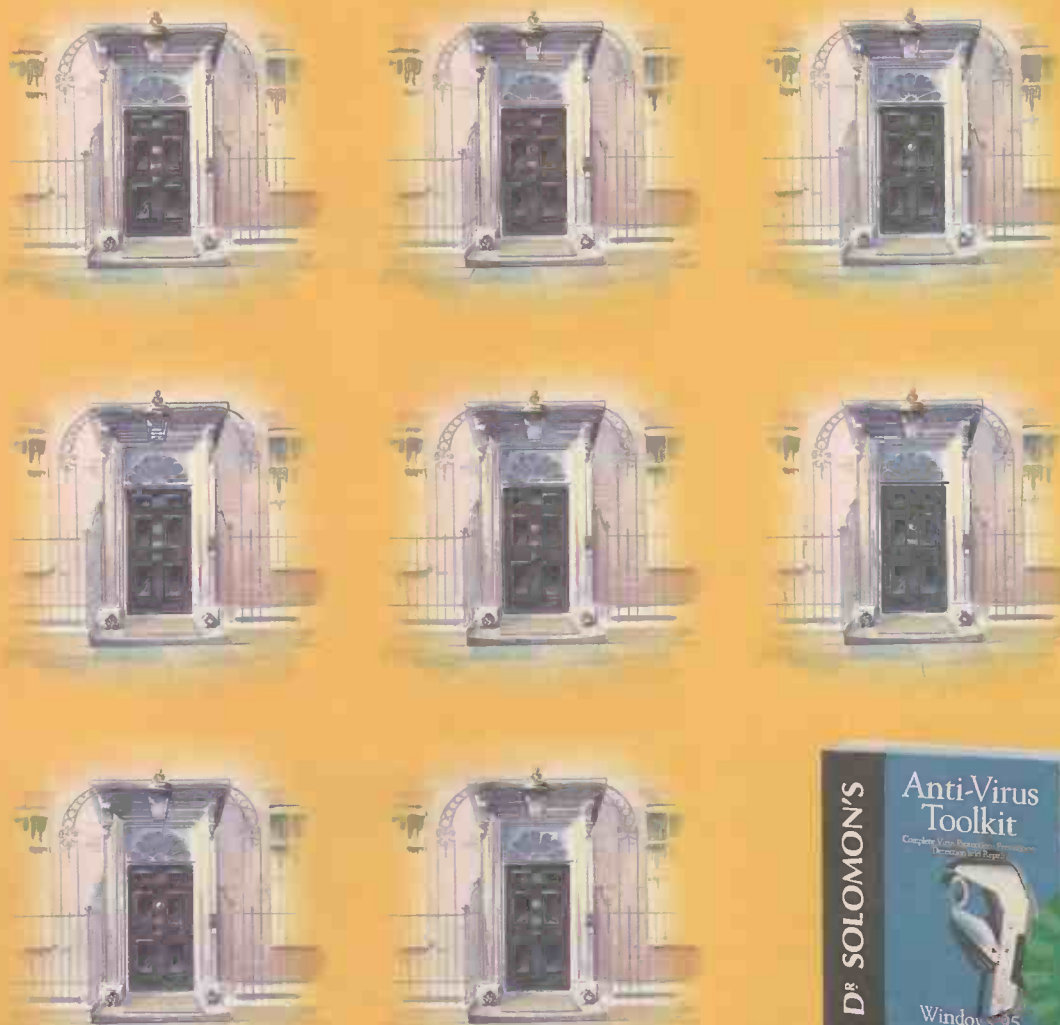


Visa's research shows that less than 0.2 percent of transactions under \$10 are made using a conventional credit card. Smartcards will enable cheaper, faster, transactions and will make it practical to charge a few pence for accessing a web site.

In the long term, everyone expects the banks to move to internet-only solutions; the simple reason is that it's cheaper than developing and maintaining proprietary client software. After that it's "Bye, bye, ATMs" according to James Lockheed, the MD of NXYS which designed the interface for the Royal Bank service. What banks want is a single interface for all banking services. You'll use that interface whether you're visiting a web-enabled kiosk at a high street bank, or surfing your bank account from your desk or from a web-enabled TV at home. You'll even use it if you're walking down the street and you're not carrying cash, just a couple of smartcards. ■

The ubiquitous queue at the bank could soon become a thing of the past with the onset of full on-line banking services and the "electronic purse"

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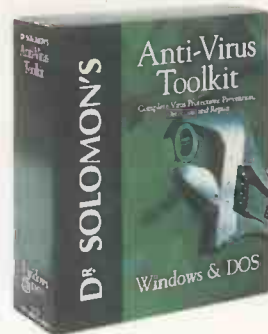


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The shops in uptown Penzance remind me of those I visited in Moscow's GUM department store during the butt-end of the Communist era. Essential items are there, but your chances of finding anything up-market or unusual are as close to nil as it's possible to get without playing for Scunthorpe United. So on those odd occasions when something vaguely exotic does turn up, everybody's natural instinct is to snap it up on sight. Not because they need it or want it, but just to stop anyone else getting it first. So when I discovered that the Penzance branch of Dixons had managed to get hold of a sheet-fed colour scanner, out popped my Visa card. Called a Primax PagePartner, it's one of those hi-tech miracles that, according to the blurb on the back of the box, transcends the functionality of a mere scanner and becomes instead a "solution", or to be more specific, a "complete input device and peripheral sharing solution" — i.e. it plugs into the PC's parallel port, while the printer plugs into the back of the scanner. Once I'd stuck in all the bits and installed the software, I availed myself of my ergonomically designed complete water-heating and throughput-enabling solution to make a cup of coffee. Then it was play time, using some pages torn from Arena.

I'd forgotten how massive an A4 colour picture can become when scanned at 300dpi. Even some inconsequential little git like Noel Gallagher amounted to 24Mb. When that girl from the Wonderbra advert joined him, the PC began begging for mercy. Finally, it gave up the struggle and declared that it had performed an "illegal operation". Then it rolled over and died. Most irritating. So I applied mouth-to-mouth and re-started, this time with my snapshot collection, at a more modest 150dpi.

Using Corel PhotoPaint, which came with the scanner, I fed stuff in and got creative. I turned people's coats from green to red, "coloured" black-and-white photographs, sharpened-up out-of-focus shots, rotated images through 180 degrees, stuck one person's head on another's shoulders and generally wasted the afternoon in a very pleasant manner. Every so often I'd get another memory allocation error or pacemaker failure, but what the hell? With today's software and hardware, it's par for the course.

Don't imagine the above is in any way innovative. No, indeed. Just as every generation believes that it discovered sex, so every new incarnation of the Pentium chip thinks it invented graphics handling. In fact, people were doing this sort of thing when many of the current PCW editorial staff were just knee-high to a workstation. At least ten years ago, there were systems around that could scan and process such high-quality colour images as I've described. Furthermore, they were more powerful than today's PC-based "solutions". And, more importantly, they were more reliable.

The big names back in the mid-eighties were companies like Quantel, Crosfield, Itek and Scitex. Their systems could "gang-scan" dozens of photographs or

transparencies in one go and feed the data, in multi-gigabyte lumps, to an adjoining workstation over a fibre-optic link. There, you could manipulate the picture in any way you wanted. If you wanted to flip it through 180 degrees, it flipped almost instantaneously. If you wanted to give Margaret Thatcher a punk hairstyle you just clicked on a box and she got an instant mohican. There was none of this hour-glass and "Please wait..." nonsense. And this was happening in the days when a 286 was regarded as a fast computer.

The reason for the hyperactivity was simple: these were all dedicated systems. The functionality was hard-coded into the chips, each of which performed just one operation. Without the drawback of a buggy operating system to hold them back, they were supersonic. But you couldn't just wander down the high street and pick up, say, a discounted Crosfield 9500 workstation for cash. A scanner and workstation setup took a large chunk out of £1m, so they didn't make much impact on the home or SoHo markets. Only the likes of Robert Maxwell and Rupert Murdoch could afford the things. But this in itself was an advantage. Today, if my graphics software suffers an embolism, mid-operation, I've got just two options; Ignore or Close. But Maxwell and Murdoch could click on a third — Sue. If the graphics system responsible for, say, the Sunday Mirror magazine decided to barf before press



Michael Hewitt

Sounding Off

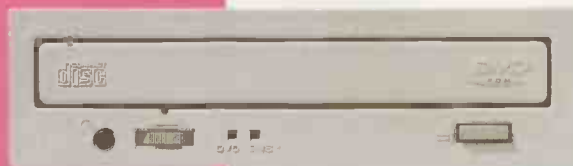
Colour scanners today are not so innovative, points out Michael Hewitt, they're just more accessible. They could never compete with a good gang-scan.

day, that would have been it. No magazine, no advertisement revenue, nothing. So the companies supplying the kit made sure their systems were ultra-reliable before they left the premises. They didn't use the customers as unofficial beta testers. If problems did occur, they didn't keep Captain Bob on hold and suggest he re-install the software or download an upgrade patch (not if they wanted their company to stay solvent, anyway); within the hour, a technician would visit.

So bear that in mind. With today's technology, we're not necessarily making progress. Just catching up.

■ MHewitt102@aol.com

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As those who read all the way to the back of *PCW* may have noticed, I fancy myself as a bit of a whizz with all this technical stuff. I can read words like "parameters" and "configuration" without breaking into a cold sweat and, unlike some columnists, I know the value of pi. Consequently, I've always felt smugly confident of being able to cope with any little problems my PC, and the electronic world at large, care to throw at me. This week, though, this hubris was abruptly punished by Nemesis.

I've been using electronic mail for six years now, through the CIX conferencing system. I can compose email messages offline using Ameol, and these go straight to a fellow CIXen's mailbox or are forwarded to other internet addresses. That's letters, if you maintain the mail paradigm, but parcels are different. If I want to send something other than a plain text message (usually a ZIP file containing documents and graphics for a feature) then it goes by binary mail. In this case, the files go straight to the recipient's private directory at CIX, and a note appears in their mailbox stating that the parcel awaits downloading.

Parcels outside CIX are delivered in a different way. Ameol converts the files to 7-bit uuencoded format and breaks it into 64-bit chunks. These can be transmitted across the internet like ordinary messages and the recipient can re-assemble the thing and decode it. In theory. Even when it does work, it's a pain in the neck. But since practically every UK computer magazine has a CIX account, the problem doesn't arise.

This week, however, I had to deliver copy and pictures elsewhere. Back came the message that the uuencode wouldn't decode. Could I please resend, not using uuencoding? Since the latter was the only option using Ameol/CIX, I sent it all as MIME attachments via my local ISP, France Telecom's Wannadoo. Okay, piece of cake; write a covering message, attach the file and press send. Off it all went... to my Outbasket, where it stayed like a great, constipated lump.

The next few hours were unpleasant in the extreme, and having exhausted the B- C- D- and F-words I got dangerously near the end of the alphabet. First, Exchange fed Wannadoo the logon password instead of the mailbox password. Having sorted that, there followed a merry dance with me clicking everything in sight and nothing occurring except my phone bill. I then tried things from the Wannadoo end, which rather unhelpfully launched Ameol again. I had an extended conversation with the little Office paperclip, who introduced me to a selection of fascinating but totally irrelevant topics, then gave up. Finally, by a combination of techniques I would rather not divulge, I got

Wannadoo and Exchange connected. And zoom! My Exchange Inbox instantly filled with my Wannadoo mail. All of which I'd already read, but let's not be churlish. Thud! My outgoing message stayed exactly where it was and nothing would shift it.

By now, the little paperclip was in tears, so I logged off and closed down Exchange: "There is unsent mail, do you really want to quit?"

Pausing only to scream, I dragged and dropped the files onto a floppy disk. I dragged the disk out of the machine, out of the house and down to the Post Office where I embedded it in a suitable "container" and attached a Sticky Tariff-Aware Mailing Protocol, or "STAMP" as postal techies would say. All that remained was to stop dragging and

drop it in the box. Sometimes, the old ways are best.

Where it's @

Thank you, all who came up with names for the @ thing, as used in email addresses. We were looking for originality and wit but also the serious requirement that it should pass the "telephone test", i.e. not sound like anything that could be confused with part of a host or domain name when spoken over the phone.

This is where many fell down: suggestions such as *a-circle* and *a-round*, although eminently sensible, use

"Off it all went ... to my Outbasket, where it stayed like a great, constipated, lump"



Tim Nott

Homefront

Tim Nott CIX over the traces, having encountered a bundle of trouble with email. And next, ladies and gentlemen, the winner of the @ thing competition.

words too ordinary to pass the test, and Ray Templeton's ingenious *atpersat* just doubles the confusion. Honourable mentions must go to *doofer* from Thomas Hodgson, Romanou Macauley's *a-nut*, Stuart Thompson's *tadpole* and Dan Ferris' *That damned "a" sign*. The two runners-up, who each get a £15 book or record token, are Sophie Dixon for her unambiguous and delightfully silly *belly button* and David White for *ampersnot*, because it's NOT an ampersand. The outright winners, of a £25 token, are Carole and Stephen Cotterell for the unmistakable and apposite *e-snail*.

■ timn@cix.co.uk

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Consumers expect their VCR or TV to last ten years, yet are resigned to a PC's working life of only about 18 months. After that it is obsolete, as it doesn't have the wherewithal to run the latest software. I spent the pre-Christmas period advising anyone who would listen not to buy a Pentium PC until the MMX chip was launched. We knew it was coming but Intel would only hint at the first quarter of the year. So when Intel officially unveiled MMX just one week into the new year and manufacturers had MMX hardware and software available for sale the same day, the company redefined the boundaries of commercial cheek and contempt for consumers. Those who had bought a Pentium PC for Christmas saw its built-in obsolescence pared down to just 18 days. A PC bought the day *before* the MMX went on sale, was obsolete within *18 hours*.

At the launch, Intel boasted that the company had been working with 100 software developers for 18 months: so, there will soon be a flood of software that will only run on an MMX. But somehow, Intel had not had the time to finalise plans for an overdrive chip that would have breathed MMX life into an existing Pentium. There was no date, no price and no information about which motherboards could be upgraded. Admitting the high cost of a new MMX chip to replace a near-new Pentium chip that has no re-sale or trade-in value, would have embarrassed even the armadillo-skinned Intel.

These days, I am telling anyone who will listen that they should hold fire on modem purchase and certainly shelve plans to install an ISDN line until the dust settles on 56K analogue modems. ISDN lines provide a basic 64Kbit/sec pipe into the internet but BT charges £400 to install the line and over £100 rental per quarter (or various confusing variations on the same outrageous theme). An ISDN Terminal Adapter, which is needed to connect the PC to the digital line, costs several hundred pounds. And the net can still be treacherous if the remote server or its route connections are clogged by traffic. The 64K connection only really comes into its own when uploading and downloading large files by direct connection, or on an email or closed user group.

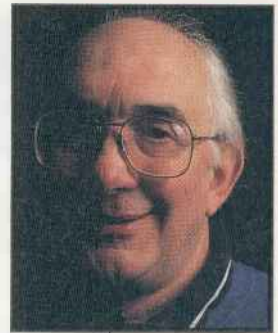
There is little point in paying for an ISDN internet connection. But if a £200 modem could run at similar speeds on an ordinary analogue line, it would be worth using. Such modems do now exist and will shortly go on sale. They achieve what should be the impossible by taking advantage of recent developments in the way Internet Service Providers and data sources connect their servers to the national and international phone networks.

The phone company uses PCM coders to sample analogue speech at 8kHz and code it into 8-bit words. This gives only 256 sample levels. It roughens the sound by adding quantisation noise, which puts a ceiling of around 35Kbps on today's modems. If service providers connect their digital servers direct to digital phone lines, the

data which streams down the line to a user's modem never passes through an analogue-to-digital PCM converter. It only passes through a *digital-to-analogue* converter before reaching the subscriber. This conversion uses only the 256 accurate levels of the PCM code and so introduces no quantisation error. Although the theoretical data speed should now be 64Kbps (8kHz x eight bits), system noise and equalisers in the phone network reduce practical working to 56K. The reverse route upstream from the subscriber's modem into the network must, however, pass through an analogue-to-digital converter as the line from the subscriber's home is analogue and the network is digital. So the upstream route suffers quantisation noise which limits data speeds.

With big market rewards at stake it was inevitable that companies would develop proprietary implementations of the 56K idea. Lucent Technologies conceived V.flex2 while Rockwell worked on the similar K56Plus system. Last November, the two companies agreed to pool resources and promote a single system, K56Flex.

US Robotics (USR) developed a different system, X2. The difference is that USR provides a return path of 33.6Kbps, whereas K56Flex claims 45Kbps. The faster return path from K56Flex is desirable because it brings analogue data rates closer to ISDN. But 33.6Kbps is more robust. The International Telecommunications



Barry Fox

Straight Talking

And it came to pass that the MMX chip laid waste the Pentium PC... Barry Fox did warn you. Now take heed: **buy** your time before buying that 56K modem.

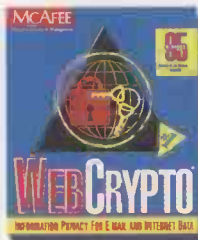
Union (ITU) is trying to set a single standard for 56K working but the industry isn't waiting. USR is making a pre-emptive strike with Sportsters which have flash memory to download the X2 code when it is ready, and claims support from ISPs. But support talk is only meaningful when a large proportion of an ISP's servers are up and running at 56K. With the industry's track record of disregard for the customer, I would want a written assurance that any 56K modem bought now will be upgradeable to whatever standard the ITU finally agrees. Without that, it's safer to wait a while.

■ Barry Fox is at 100131.201@CompuServe.COM

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When a large company buys PCs and software, it usually either contacts a manufacturer directly or goes to a specialist dealer who will provide staff full-time in order to handle the company's every need. When a small business goes IT shopping, it's a different matter. The kind of service provided will be on a different scale. So how best to proceed in the purchasing jungle?

The cheapest approach will generally be mail order, but purchase price isn't the only important factor. Support could well be an issue, and there's a limit to what can be done down a telephone line. Against that you need to set the extra cost of shopping in the high street and some assessment of chance that the local retailer will deliver on its support promises.

Large mail-order companies like Dell have built a reputation on good customer service (even if there's been some grumbling in the press lately), usually providing lifetime phone support and everything up to on-site next-day maintenance. A box-shifting outfit looking to provide the tightest deal on memory or software is unlikely to have the same level of support, but can be extremely competitive.

There's a range of options available on the high street too, from Dixons to the small computer shop. However, the most likely place to walk into these days is PC World or one of its competitors. The PC superstores accept that they can't match mail-order firms on price, but claim instead to provide better support when buying, better assistance after the sale and general handholding.

Perhaps surprisingly, when buying what is typically the most expensive purchase, the PC itself, mail order has a lot going for it. PCs usually come preconfigured and setting them up is a simple exercise. You have to be careful how you make the purchase: like many others, I have been caught out in the past when a PC firm went bust between accepting my order and delivering the goods. Because I had placed the order with a credit card, my Visa company refunded the loss. Otherwise I would have been left scrabbling for cash with the other debtors.

Of course, an absolute beginner may be unhappy with a box dumped on the doorstep, but however effective the assistance from a superstore, it is not going to turn you into a confident user. A short course or a few evenings with an expert friend are more likely to help. Software, similarly, is a straightforward purchase. Choose the package you'd like with the help of a suitable magazine, and order it. Installation is rarely a problem these days. There's little reason for bearing the cost of the high street.

It's the middle-ground, secondary hardware like a printer or a new hard disk that demands more support. In the first place, you need to get the equipment in place. If

you don't feel confident about opening up your PC, most superstores offer an installation service. There might be some doubt about compatibility — again, avoid mail order. PCMCIA cards, for example, are notoriously fussy, running in some machines and not others. When I recently bought a CD-ROM for my laptop I noted the stern warnings in the mail-order listings that they did not send products out on trial. When I pointed out the possible incompatibility at PC World, the salesman had to check whether I could return the item, but agreed that I could.

With other kinds of purchase, it's not always obvious whether the superstore or the mail-order merchant will provide the best assistance. I recently enquired at a superstore about the cost of ink cartridges for a printer it was selling. Despite the salesman's enthusiastic attempts, he couldn't find them in the store and had no means of looking up the price on computer.

Again, when I asked about an external hard drive, a different salesman searched for a while, decided they had been moved and couldn't tell me which products they stocked. Mail-order firms answered these questions immediately. A few weeks beforehand I had wanted to buy an internal tape drive. I had read of problems obtaining suitable drive rails to mount the drives. The mail-order firm couldn't help at all. PC World staff thought



Brian Clegg

Business Matters

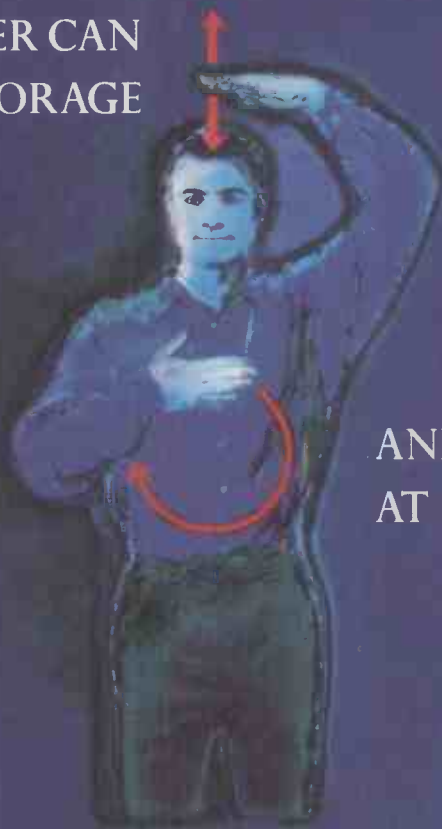
What's the best way to purchase a PC in the shopping jungle — mail order, the high street, or a superstore? There's good and bad in all of them, says Brian Clegg.

I didn't need drive rails, but if I did, they had a handful of them labelled for a different manufacturer's machine which they thought might work. In the end, with a little ingenuity, I got the drive in without rails, which was probably just as well.

You pay your money and you take your choice. Where you need help with installation or there is some doubt about compatibility, the superstore is attractive. In other circumstances, it's a bit like taking out an extended warranty. It may give you peace of mind, but many of us would prefer to underwrite our own risk and save the money.

■ BrianClegg@msn.com

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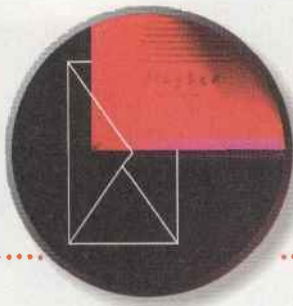
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Refreshing change

I note that in the Table of Features section of the MMX group test in the March issue of *PCW*, the Iiyama Pro 9017E monitor is quoted as having a maximum refresh rate of 75Hz at 1024 x 768. I use one of these monitors with a Matrox Millennium card with a refresh rate of 85Hz at 1152 x 864 in 24-bit colour. At least, that's what is reported by both the monitor and the Windows 95 software.

Ian Ford

101765.2712@compuserve.com

No more Mr Nice Guy

The baby's head/fork incident: I thought it was quite tasteless, offensive and utterly vulgar. But then again, so am I, so I found it rather amusing. Don't let the Goody-Two-Shoes Brigade get you down!

Malc Smith

malcolmsmith@compuserve.com

Here's to you, Mrs Robinson

In your *Letters* page in the March issue, there were some comments about the ChipChat thing that involved a fork being stuck into a baby's head. Most correspondents said they thought it was in bad taste, but these people should have taken it for what it was — a joke.

Obviously these people have nothing better to do than sit around and moan about things that don't have any significance. They're all probably boardroom bigwigs with nothing better to

do. You know the type, Anne Robinson's fave people.

Lindsay Taylor

106414.370@compuserve.com

Modulation matters

In his "Rant corner — baud and bps" (*PCW March, p304*) Roger Gann describes as embarrassing "the number of otherwise knowledgeable people who use the terms baud rate and bits per second interchangeably". It's also embarrassing to complain about other people's gaffs while committing your own.

Modulation does not mean "to encode digital data into analogue waveforms", as Gann writes. That process has been given the quite transparent name of "digital-to-analogue conversion". Modulation is a technique in which data signals are used to modify the amplitude, frequency, or phase of a carrier wave by means of modems (modulator/demodulators). The carrier wave chosen is of a suitable frequency for transmitting over the specified channel.

The last time I brought this common error to your attention, the columnist attempted to excuse himself with the claim that making technology intelligible to the masses calls for a degree of simplification. If that were true, your magazine would be able to explain the recent increase in maximum transmission rate over the public telephone network from 33.6Kbps to 56Kbps. This has

not been satisfactorily explained in the several articles which have attempted to address the issue. The reason is clear: nobody at *PCW* understands it.

Gabriel Egan

exs01gie@gold.ac.uk

Lost in time

Your MMX news story (*Newsprint, March 1997*) states: "Intel's Multimedia enhanced MMX chips were launched to a resentful world last month". Now that would be February, but I am writing in January. Must this pretence continue month after month? It's not as if you take ages to get into print. See page 34: "So January sales have been more successful than the pre-Christmas run-up, but it lasted for two weeks of January only", and I am writing this only two weeks later.

Jim Mann Taylor

Phlomis@aol.com

Don't believe the MMX hype

I'm amused that Adam Evans has been taken in by Intel's hype about the MMX processor (*"New technology: All about MMX", PCW March, p178*).

He says that "MMX is the most significant change to the basic architecture of the PC processor for ten years". Hogwash! The improvements are hardly as significant as the change from 8086 to 286 (protected mode, 16Mb memory), 286 to 386 (32-bit access, 4Gb memory, virtual 86 mode, on-board MMU) or 486 to Pentium (64-bit data, on-board cache, pipelining,



Crash and blow dry

I bought a Packard Bell from PC World at the end of November. When you spend £2,000 on a computer, you expect it to work for more than a few weeks. Considering I've been out of the country for four of those weeks since my purchase, it was only up and running for a short time.

Well... My HDD broke last weekend. An engineer came round and told me I had lost everything. I'm a writer, and not being the most diligent person in the world at backing up, I was distraught.

The engineer didn't have the right replacement so he went toddling off. The next day a friend of mine who "fixes" computers came round for a look. He also told me that I had lost everything. After a couple of glasses of wine I said: "Please, just have one more go." He did. When I said it sounded like the drive was cold, he jokingly said: "Get your hairdryer." I did. We warmed the poor little thing up and hey presto! It began working, long enough to retrieve everything. Modern technology, who needs it? Sell me a hairdryer instead, any time.

Bethan Davies

bethan_davies@compuserve.com

instruction pairing). The MMX Pentiums have a bigger on-board cache, one extra stage in the pipeline and better branch prediction. This accounts for the 10-20 percent improvement in performance, but is hardly radical.

MMX also adds some new instructions that operate on sets of eight bytes, four words, two double-words or one quad-word at a time. They're orientated towards signal processing, and re-use the FPU registers to provide instruction control and repetition.

Working like this is called Single Instruction, Multiple Data.

SIMD is not a separate "new process" (as shown in the article) but just a description of how the new instructions work. It's been around on chips costing tens of dollars (not hundreds) for years now.

A DSP chip (or a good DSP/CPU hybrid) can work with more than eight bytes at once. This is the technology in modern graphics accelerators, sound cards and modems. It's why you can buy a 3D graphics card, video RAM and all, for less than the price of a Pentium chip.

A 200MHz MMX Pentium is unlikely to be able to simultaneously act as a

33.6Kbps modem, wavetable sound card and 3D graphics accelerator — and also run the operating system and application. Multi-player games and interactive 3D web sites are just two applications I can think of that require this.

Yes, MMX means these cards can be made more cheaply, but only at the expense of eating into that prized processing power you spent all that money on buying a Pentium for in the first place.

MMX is a good idea for graphics applications like CorelDraw, Photoshop and Video for Windows, and it's good that the chips are backwards compatible with Pentium motherboards. But don't fall for the hype: it doesn't turn the Pentium into a DSP and it won't replace real multimedia hardware.

Sam Edge

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www.tcp.co.uk/~edge

Compatibility blues

My daughter recently purchased a Lexmark 1020 colour printer and I purchased some Express Software educational CD-ROMs, both from well-known high-street stores. The advertising both in national newspapers and in the store gave no indication that both would not run on the family 386 PC. In fact, the CD-ROM box stated that they would run under Windows on a 386.

The printer was a joy to install and was operating from Windows in minutes, but the CDs were not so good. Our PC with Windows 3.1 was not capable of running the CD programs and careful reading of the leaflet packed inside the box stated: "Make sure the computer is running DOS either from Windows or a C> prompt". So the CDs are fine direct from DOS until we want to print from them. You then find that the

printer has no DOS driver so can only print from Windows.

Thus you are up against the classic non-compatibility problem: both are okay on their own but they cannot talk to one another. Having spent most of my working life struggling with this problem, the first recourse is to helplines. Unlike the major manufacturers, the PC lines have only two states: engaged, or not replying with occasional lapses into answering. Such slots finally managed to elucidate the reply: "Tough luck, not our problem".

I am writing to ventilate a problem I know from professional consultations is common in the domestic PC market, and to ask if there is any way to make suppliers clearly mark their products with its performance, like "Best run under DOS" or "Only works from Windows", allowing purchasers to know what they are buying. Perhaps you could run an "honest supplier" index?

David Green
Bedford

The numbers game

The article on paying by credit card over the internet (*Straight Talking, PCW March*) was interesting in that no amount of encryption would have solved any of the problems outlined by Barry Fox. Once a firm has your number, they can charge twice or thrice, as Barry says, and just apologise for an "administrative error" to customers who detect that this has happened.

One solution would be for banks to issue sets of numbers to their customers, each of which would be used once only, like cheques. When ordering goods from a firm, the purchaser would give them a number and notify the bank electronically at the same time that this number had been issued to Firm X for an amount not exceeding, say, £100. Firm

p57 >



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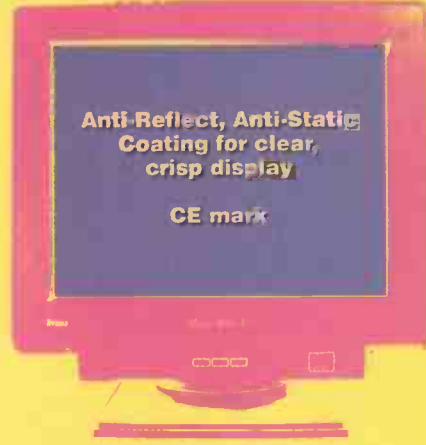
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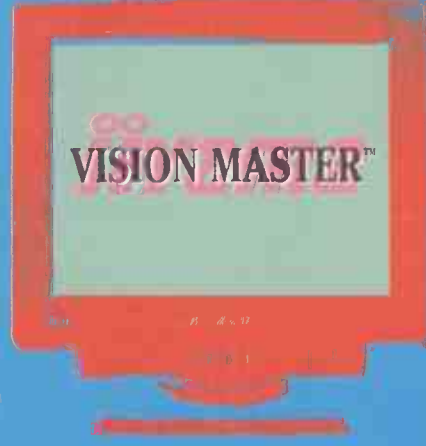


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X would not be able to claim the payment unless they quoted the same number to the bank through the clearing system, and since it would only be valid for one transaction it would be of no value to hackers either.

This would not solve Customs problems, though. I ordered two boxes of cards from the Metropolitan Museum of Modern Art in Boston, USA, via CompuServe. Customs and Excise intercepted the package and charged me £7.50 for having done so.

Dr R D Turner
North Yorkshire

TV times

I'm a confused computer user; but then, aren't we all? The coverage of computing by the media is really getting me down. By and large, the quality of the written word in computer magazines is pretty good, the only problem being that they all seem to be testing the same item of kit at the same time. One does an article comparing monitors, they all do an article comparing monitors.

The news media normally gets things wrong and, of course, tries to make things as dramatic as possible. For instance, that all our computers are going to fall over on 1st January 2000 and we're all dumping our 200MHz Pentiums just because they don't have MMX. The coverage that really gets me down is that given by television, both terrestrial and satellite. The BBC gives us The Net, which is on late at night and normally has a very short run, and British Sky Broadcasting gives us The Computer Channel for two hours a day. Do computer users have amazingly short memories? The Computer Channel seems to think so, as it repeats the same items over and over again. During its first

few weeks it even repeated items in the second half of the programme which it had already shown in the first! It also seems to assume that all computer users are complete morons. I know that new users have to be catered for, but you really can take this too far. And they have.

The site from NBC, also on satellite, was quite good when it started, but unfortunately they too seem to have run out of ideas and have gone the way of The Computer Channel, repeats now being the order of the day. NBC also gives us a couple of hours during the weekend, but again most of the output has been seen before.

So are we ever going to get an up-to-date programme with news, reviews and decent information, or are we expected to put up with the rubbish we are getting now? I live in hope.

John Godfrey-Parkins
Somerset

We look forward to the day when "The PCW Channel" is launched. With the coming digital TV revolution, it may yet happen!

Still in touch with touchpads

We are all familiar with the mouse and trackball, but whatever happened to the touchpad? Some time ago I came across one of these gadgets attached to a desktop computer and, having had the opportunity to try it out, it immediately became a "must have". I searched the pages of PCW but couldn't find any mention of this nifty gadget. I eventually located one, an Alps Glidepoint, under the counter of a shop in Tottenham Court Road. Although quite expensive, relative to the mouse it replaced, it took up much less space on the desktop (about three inches square). It has three

programmable buttons, the left-hand one rarely being used because a quick double-tap of the screen does the same job. With only a small movement of the forefinger, the cursor moves swiftly and precisely around the screen.

When I upgraded my computer, I needed to change the pad from PS/2 type to serial. Having tried unsuccessfully to obtain an adapter, I wrote to the manufacturer in America for advice. They replied by sending me a complete upgraded unit with their compliments. What British supplier would give service like that?

With mice and trackballs approaching the price level of the touchpad, why aren't these delightful little devices more available over here?

Thousands of people don't know what they're missing.

P Gabbitas
East Sussex

Help! I'm dealing with Microsoft

Is Microsoft getting too big for its boots (and the customer's pocket)? I had a problem connecting with MSN (sounds familiar?). I called the helpline, who said that it was Win95 related and I would have to call 01734 271000.

Upon doing this, I was promptly advised that since I was out of my 90-day free support period, help could only be obtained to the tune of £30 per problem plus VAT. Having paid a whole year's subs to MSN, I protested that any savings thus made would be wiped out by such a charge. "Sympathy" was expressed, but I was told that this was company policy and was referred back to MSN on the grounds that they should be able to solve the problem anyway. MSN referred me back to Microsoft, saying that my



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particular problem did not fall within their brief. Resigning myself to what seemed the inevitable, I rang Microsoft back (this was on Friday night, 1700 hours) to be told that they were now closed, and this meant I had no chance of correcting the problem until the following Monday during working hours, the time when it is most difficult for me to make contact as I am teaching.

CompuServe and other service providers would presumably have attempted to correct the problem, not having other departments to fob their problems onto. Am I therefore better off using the latter in the future, or would they also be in difficulties if the problems were Win95 related? I tried complaining to Microsoft Feedback but received no reply.

Trevor Jones
 THJones@msn.com

What millennium disaster?

In view of the concern over the coming millennium problem, I have carried out a number of tests and have found that all my older computers will handle dates into the millennium.

I have set my computer dates to 31/12/1999, let them roll over to 01/01/2000, turned them off and on again, and lo and behold, the system registers a date from back in the eighties. However, if I set the date of the system to 01/01/2000 and turn off the system, the millennium date is retained.

I have carried out tests using a number of millennium dates (up to 30 years into the millennium). The system represents the correct day of the week to correspond with the date, and recognises leap years, too.

In view of these tests, will my systems handle the millennium or have I missed something? If my findings are correct, why all

the hype about computer disaster in the millennium?
Karen Smith
 fh51@dial.pipex.com

More on file sizes

I read with interest the debate in your Letters pages concerning file sizes and I have something to add to this.

I carried out the following steps in Microsoft Word 7, saved the file after each process and found the file size:

- I created a blank document (11Kb);
- typed in "Hello World" (11Kb);
- inserted a 100Kb .bmp image (140Kb);
- removed the image (146Kb);
- deleted the text, leaving a blank document (146Kb); and
- saved this file as a different name (11Kb).

Please draw your own conclusions from this.

Nick Venn
 Nick@vennp.demon.co.uk

Rough and ready

I was surprised that in Dylan Armbrust's review of the Panasonic CF-25 (*PCW February*) he mentioned how easily a laptop broke when you dropped or banged it.

I had a colour DX2/50 laptop and accidentally dropped it down a flight of stone stairs in my college. It fell on its side, its front, down about 25 stone stairs, and guess what? It was perfectly all right, apart from a few keys that had come out. It booted up first time!

This is not the first time my laptop has been subjected to bad treatment. I have accidentally dropped earth all over the keyboard and after a bit of shaking it was fine.

Why spend an extra £1,000 on something a bit more durable, when you could buy insurance for a fraction of that price?

Ben Way
 CompuServe 71333,2330 ■

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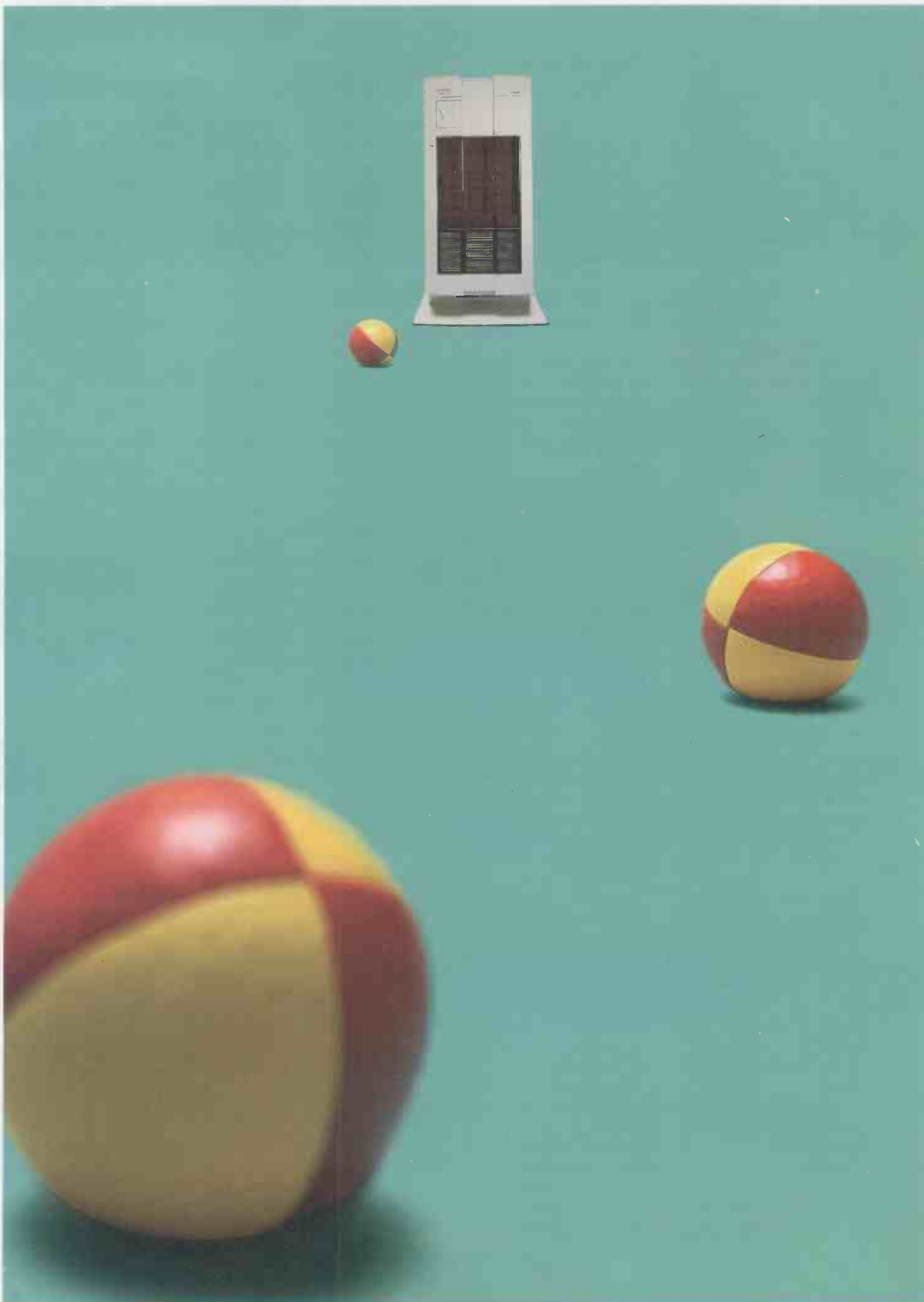
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PCW Awards 1997

Your chance to vote in the seventh annual Personal Computer World Awards and win a super Sony Mini Hi-Fi and £100 of Virgin vouchers in the PCW Reader Awards.

The Sony system features CD player, dual tape decks, FM tuner, 30W super-woofer and full remote control. One lucky person will win this fantastic prize when the draw is made from all entries received by 25th April 1997. Fifteen runners-up will receive £50 Virgin vouchers.

The Personal Computer World Awards are about rewarding excellence and attention to service. The categories this year cover the industry like never before, with new awards for Hardware, Software and an extended list of Online Awards, reflecting the growing importance of the internet in business and home computing.

And your votes really count. We want to know which companies out there are supplying you with the type of service you'd want to recommend to someone else. We have split the Reader Awards into nine categories, in an attempt to cover the areas of service and reliability that affect you. The Reader Awards are decided solely by you, and are highly valued by the companies advertising in the pages of Personal Computer World.

In the other categories, your nominations are discussed by an expert panel of judges (see left) to produce a winner and two runners-up.

To make sure you are in with a chance of winning, fill in the categories on the form facing this page, tear it out, fold along the dotted lines and pop it in the postbox. We'll even pay the postage!

Vote on the Web

This year for the first time you can vote via the internet. Just go to www.pcw.vnu.co.uk and follow the link to the online voting form.

The publisher of *Personal Computer World*, VNU Business Publications, will donate 20p to Oxfam's International Appeal Fund for every entry sent in. So, the more of you that enter, the more money VNU will be able to give to Oxfam.

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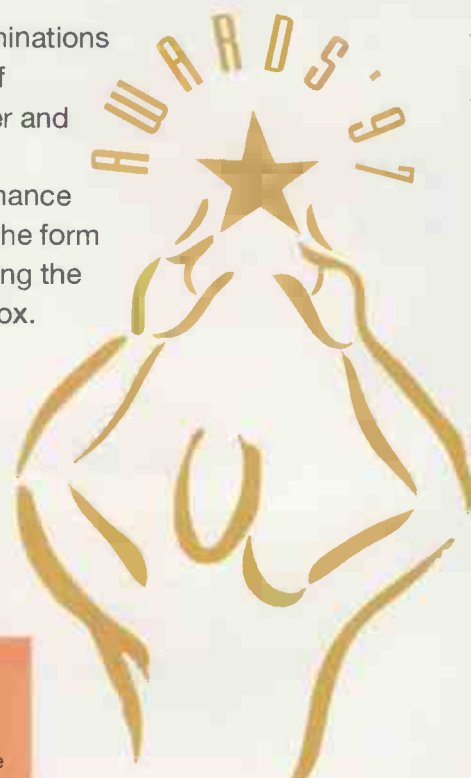
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Awards categories

Fill in as many categories as you want, complete your personal details, fold the form and post it to us (or fax it to 0171 316 9313).

Reader Awards

1	Best high-street retailer
2	Best software dealer
3	Best hardware dealer
4	Best PC supplier (mail order)
5	Best hardware telephone support
6	Best software telephone support
7	Best on-site maintenance
8	Most reliable PC
9	Best advertisement

Hardware awards

10	Most innovative hardware
11	Best PC system for business
12	Best PC for the home
13	Best notebook
14	Best laser
15	Best budget laser — under £350
16	Best inkjet
17	Best budget inkjet — under £300
18	Best modem
19	Best graphics card
20	Best gadget
21	Best handheld/palmtop

Software awards

22	Most innovative software
23	Best software suite
24	Best software application (excluding suites)
25	Best creative software
26	Best internet browser
27	Best utility
28	Best CD-ROM reference title
29	Best CD-ROM kids title
30	Best game

Online awards

31	Best Internet Service Provider (ISP)
32	Best content provider (not including ISPs)
33	Best UK web site
34	Best web site on the internet
35	Best use of interactivity on a web site

Your details

Name _____	Job Title _____
Company _____	
Address _____	
Telephone _____	Postcode _____
	Fax _____
The closing date for nominations is 25th April 1997.	
Please tick the box if you do not wish to receive promotional material. <input type="checkbox"/>	



SECOND FOLD

2 | |

Awards 1997

The Editor
Personal Computer World Magazine
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FIRST FOLD

TEAR OUT

THIRD FOLD (please tuck inside second fold)

"Go out and buy one at once"

Computer Buyer - Nov 96



"Here in PC Pro Labs, we were so amazed at the price of the Elite 200 Fireblade that we thought a mistake had been made. It hadn't. The value for money is nothing short of incredible,

and our benchmarks prove that the performance is equally impressive. Graphics are taken care of by the famously fast Matrox Millennium. Even though there are many cards that can now compete with the Millennium, it's still a great graphics adaptor and a worthy addition, especially at this price. There really is absolutely no adverse comment that can be made about the MESH Elite 200 Fireblade: it's quite simply a fabulously well-specified PC for the money. Usually, when a price is set so low it becomes apparent that corners have been cut drastically in order to compensate. In this case, however, a top-quality machine has been produced, providing superb performance. To be blunt, **if you're looking for a high-specification system at a reasonable price, you need look no further than the MESH**". PC Pro - Dec 96



MMX
The latest processor from Intel features a massive 32Kb on-board cache and an extra 57 Multimedia specific instructions. Performance on standard applications is boosted by around 10-15% and MMX applications by around 60% (Intel figures).

Computer BUYER BEST BUY

"MESH is making marvellous machines these days and this is one of them. The MESH Elite 200 Fireblade has good software, a decent screen, great performance and an excellent price. MESH does particularly well on the docs. They are well organised and complete. We even like the keyboard. Love? Mere infatuation. This is the real thing. **Go out and buy one at once**". Computer Buyer - Nov 96

- ★★★★★ MESH ELITE 200 FIREBLADE
- ★★★★★ EYESHAM VALE PLATINUM HX P200 MEDIA 96
- ★★★★★ DOTLINK HOME MULTIMEDIA 2001
- ★★★★★ CARRERA POWER MEDIA 200
- ★★★★★ RED BOX WINSTATION 200

P200 Elite Fireblade II

- Pentium MMX 200MHz Processor (P200)
- 32 Mbyte Fast EDO RAM
- 2 Gb Fast Access E-IDE Hard Disk
- 512Kb Pipeline Burst cache
- 4Mb WRAM Matrox Millenium Graphics
- 15" FST Digital SVGA Colour Monitor
- 12 Speed CD ROM
- AWE32 Plug & Play Wavetable
- Altec Lansing CS5 Stereo Amplified Speakers

NEW HIGHER SPEC

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* Except Pipex Internet access and Tel-Me. * Personal finance prices shown are for illustration purposes based on 10% deposit with the balance paid over 36 months and are subject to status. Please call for details and a quote. Prices include VAT (17.5%). Insured courier delivery within mainland UK £20 + VAT. These offers supersede all previous offers. Industry standard practice is to measure monitors using the CRT size. Actual viewing area can be approximately 1" less. Prices & Specification subject to change without notice. All sales subject to MESH Computers PLC Terms & Conditions of Sale which are available on request. The Intel Inside & Pentium Processor Logos are trademarks of Intel Corporation. All other trademarks acknowledged. E&OE.

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Gadgets

PCW Gadget Photography by David Whyte

InFocus LiteGo 320

Measuring a mere 74 x 262 x 396mm when folded, and weighing 4.2kg, InFocus's LiteGo 320 is the world's most portable multimedia projector. It's little larger than a notebook computer and should slip into most carrying cases. When you are ready to project, the unit unfolds for action. The image is produced with a 6.4in LCD panel and a 410W lamp. The 320 is compatible with PCs and Macs running at resolutions up to 800 x 600 pixels, and can display PAL, NTSC or SECAM video. Built-in rear-facing powered speakers complete the multimedia experience.

Price: £5,281.63 (£4495 ex VAT). InFocus UK 0181 213 2100



JVC GR-DVM1

Following JVC's GR-DV1 featured in last month's Gadgets is the GR-DVM1. Both are handheld digital video cameras with ten-speed optical zoom lens. The symmetrical vertical design allows right or left-handed operation and viewing through either eye. The GR-DVM1 is equipped with an LCD screen and is available this month. The DVM1 is slightly larger than the DV1, the world's smallest and lightest digital video camera. Nevertheless, the DVM1 only measures 59 x 156 x 94mm and weighs 730g with tape and battery.

Price, under £2,000 (or £1,702.13 ex VAT)

JVC UK 0181 450 3282

Psion Dacom Global Gold Card

There's gold in them thar fax/modem cards. Psion Dacom has plated 25,000 of its new Gold Card Global GSM-ready fax/modem cards in real gold. This marketing ploy is not as expensive as you may think: it seems that coming up with a paint that looked like gold would cost as much as the real thing. The card offers a 33.6Kbps fax/modem with an optional mobile data upgrade; you'll also need a data-capable digital mobile phone. The standard modem card has a list price of £245.58 (£209 ex VAT). Upgrades to support a variety of mobile phones cost £163.33 (£139 ex VAT); the exception is for Nokia phones, £186.83 (£159 ex VAT).

Psion Dacom
01908 261686

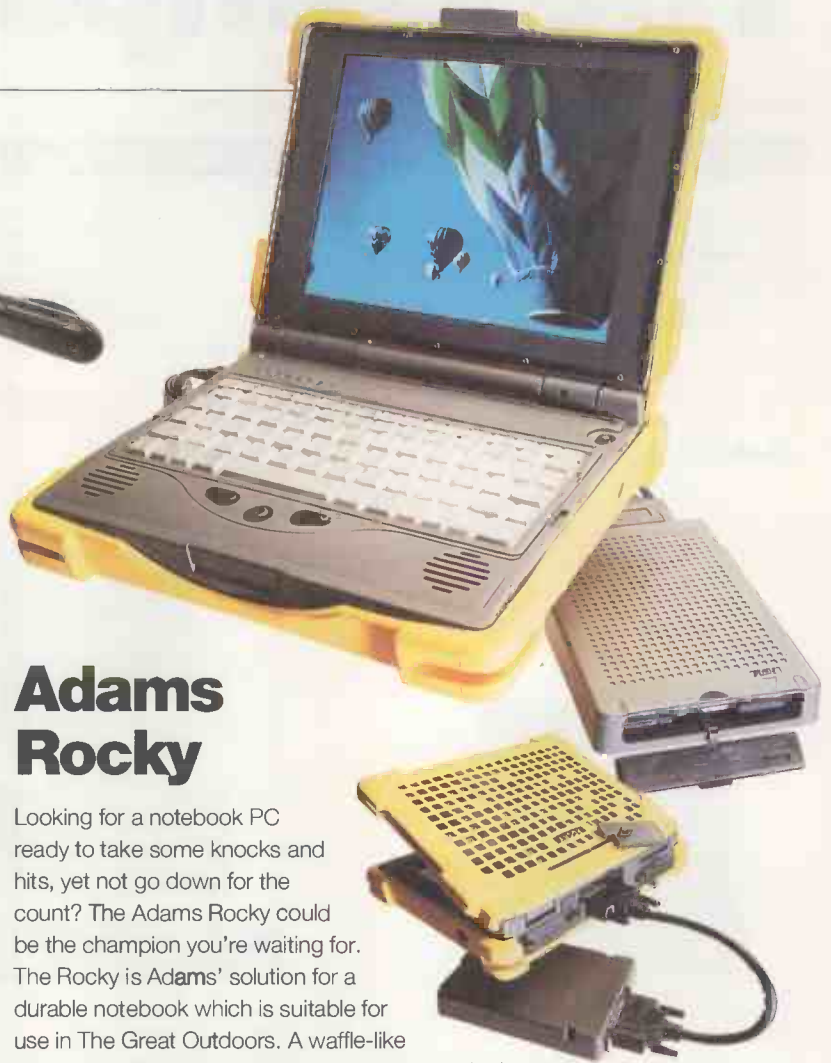




Sony CMD-Z1

Years ago, Sony brought us the CM-R111, an analogue mobile phone which fitted the palm of your hand. A boom microphone sprung out from the side to reach your mouth. Fans of Star Trek-style communicators loved it but longed for a digital version with a display. Well, here comes the new CMD-Z1, which is based on a similar concept but operates on the digital GSM 900 system and boasts an enormous, detailed, display. It sits in your left hand, with your thumb hovering above a jog dial to select and execute its wide range of functions, leaving your right hand free. The Z1 is easy to use, works brilliantly and looks great. It will be available next month for between £150 and £200, with a suitable subscription to Cellnet or Vodafone GSM. A 9,600bps PC mobile data card with built-in 33.6Kbps modem will be available later.

Sony 0990 111999



Adams Rocky

Looking for a notebook PC ready to take some knocks and hits, yet not go down for the count? The Adams Rocky could be the champion you're waiting for. The Rocky is Adams' solution for a durable notebook which is suitable for use in The Great Outdoors. A waffle-like rubber jacket protects the case, while the interior is dual-chambered to reduce the penetration of dust and water. It will even cope with a half-metre fall. Prince Naseem, watch out!

Price: £3,583.83 (£2,999 ex VAT)

Adams Technology 0161 283 1000

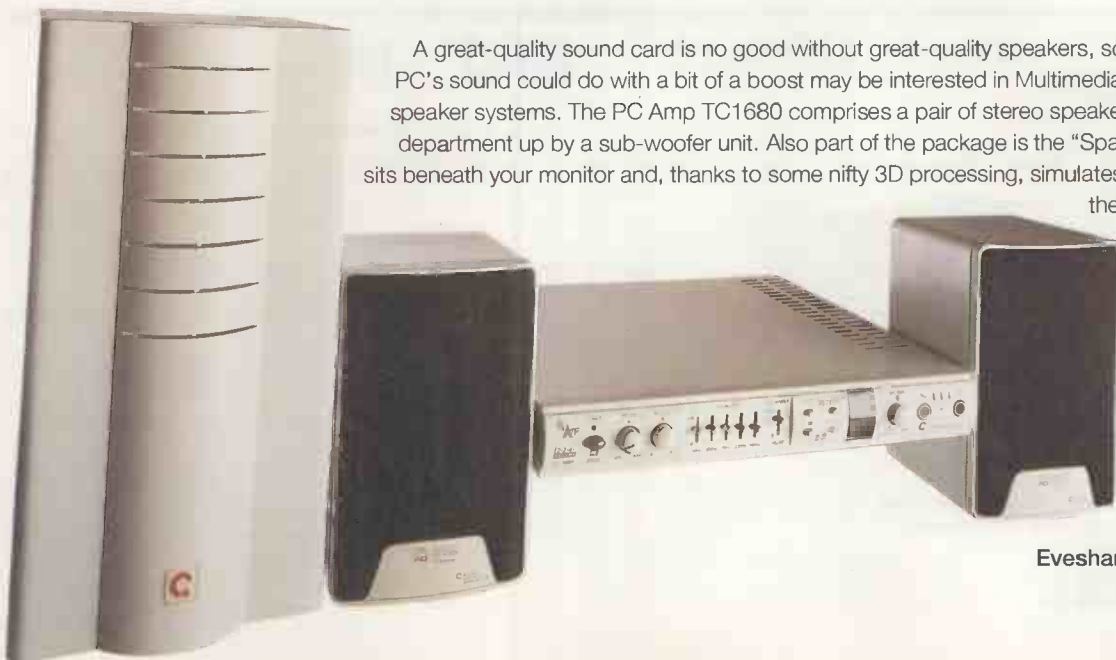
Multimedia Labs PC Amp TC1680

A great-quality sound card is no good without great-quality speakers, so anyone feeling that their PC's sound could do with a bit of a boost may be interested in Multimedia Labs' range of powered speaker systems. The PC Amp TC1680 comprises a pair of stereo speakers, reinforced in the bass department up by a sub-woofer unit. Also part of the package is the "Spatialiser", a slim unit which sits beneath your monitor and, thanks to some nifty 3D processing, simulates surround sound without the need for extra speakers.

The amplifier supplies 22W per channel RMS (those are *real* Watts) and should keep anyone happy, from serious business users to hardcore games addicts.

Price: £222.08
(£189 ex VAT)

Evesham Micros 01386 765500



The Complete IT Sol

Notebook

TFT Colour Notebook

The TFT colour notebook series from Elonex gives you access to the latest high-powered Pentium computing on the move. With an **extra long-life Li-Ion battery** and a superb 12.1" TFT screen to complement built-in audio capabilities and a CD-ROM drive option, you don't need to look any further to find the notebook you've always wanted.

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- 133MHz Pentium Processor, 16MB RAM (expandable to 64MB)
- 12.1" TFT Thin Film Transistor colour screen
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- Built-in Mode 3 PCI EIDE disk drive subsystem
- 256KB external cache
- 16-bit audio with FM synthesiser, built-in stereo speakers and audio ports
- 2 x PCMCIA Type II slots, or 1 x PCMCIA Type III slot
- Li-Ion battery and AC power supply
- 1 x ECP/EPP parallel, 1 x serial, 1 x external keyboard or mouse port, 1 x SIR port
- 1 x external video port, supporting 1024 x 768 resolution
- Touchpad pointing device
- Windows 95 pre-loaded

Desktop PCs

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Elonex's desktop Pentium range breaks new ground in terms of speed, power and flexibility. By neatly matching the power of Intel's Pentium Processor range to the Peripheral Component Interconnect (PCI) local bus standard, Elonex has provided the platform of choice for those who require advanced but easy-to-use computing. Intel's very latest Pentium processors with **MMX Technology** are also supported.

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- Built-in 64-bit PCI Graphics Accelerator with 1MB EDO DRAM
- Slimline 'B' case - 2 x PCI, 2 x ISA and 1 x PCI/ISA slot,
- 5 x drive bays
- 14-inch non-interlaced SVGA Monitor
- 1 x ECP/EPP parallel, 2 x RS-232 16550A serial ports
- 105-key Windows 95 UK keyboard and Microsoft mouse

'H' Case Pentium Computers

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ution from **ELONEX**

Mini Towers

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The Elonex PT Mini Tower—a personal desktop vertical system with the flexibility to accommodate Pentium or Pentium Pro processors. Configure with a Pentium processor for a compact workhorse with plenty of expansion capability or choose a PT-6000/I Pentium Pro for the ultimate in desktop PC performance.

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- 256KB pipeline burst cache
- 16MB EDO RAM (expandable to 256MB)
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- 64-bit PCI Graphics Accelerator card with 2MB EDO DRAM
- "PT" Mini Tower - 3 x PCI slots, 3 x ISA slots and 1 x shared PCI/ISA slot;
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- 105-key Windows 95 UK keyboard and Microsoft mouse

Servers

MTX Server

The new MTX server combines a high specification motherboard with a chassis designed to provide the maximum expansion in a compact case – making it the ideal choice as a very high performance departmental server.

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- 200MHz Pentium Pro CPU
- 32MB EDO RAM (expandable to 1GB in eight sockets)
- 3.5" diskette drive
- 2GB SCSI hard disk drive
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- MTX case – 3 x PCI, 3 x EISA, 1 x PCI slot
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Elonex's MT Mini Towers are a miracle of design engineering – combining awesome power with ergonomic practicality and functionality. The Mini Tower matches powerful Pentium or Pentium Pro processing capabilities with massive storage options offering up to ten drive bays – including a range of high speed disk arrays.

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- 512KB pipeline burst cache
- 16MB EDO RAM (expandable to 512MB)
- 3.5" diskette drive
- 2GB SCSI hard disk drive
- Built in Mode 4 PCI EIDE dual-channel controller
- 64-bit PCI Graphics Accelerator card with 2MB EDO DRAM
- "MT" Mini Tower – 3 x PCI slots, 3 x ISA slots and 1 x shared PCI/ISA slot;
- 5 x drive bays and 5 x bays for optional disk array
- 14-inch non-interlaced SVGA monitor
- 1 x ECP/EPP parallel port, 2 x RS232 16550A serial ports
- 105-key Windows 95 UK keyboard and Microsoft mouse
- Windows 95 pre-loaded



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First Impressions

We have a pair of **Toshibas** under scrutiny, one of which is the **Tecra** (below), an MMX notebook, and the **SD-M1002** (p76), *PCW's* first review of a DVD-ROM drive. There's a couple of printers from **Epson** (p83) and two digital cameras from **Sony** (p80). Software calls on **Borland Delphi** (p86), **Dr Solomon's HomeGuard** (p84) and **MacroMedia Flash** (p93).



■ Hardware

Toshiba Tecra 740CDT

Perfect for big-screen presentations, this MMX portable ushers in a new generation of notebooks.

Toshiba's latest addition to its notebook range is the first in the UK (and on the market, according to Toshiba) to feature Intel's new MMX-enhanced Pentium processor. There are other MMX-based notebooks promised in the near future from IBM, Compaq and Fujitsu, and we'll be reviewing the NEC MMX offering in the next issue of *PCW*, but for now, the Tecra is it.

Fitting portables with the MMX makes a lot of sense, as the chip is good at improving the speed of audio and video decompression and playback which form a major part of notebook-based presentations. The MMX's low internal operating

voltage yields benefits in terms of lower heat generation, with the "mobile" version operating at just 2.45V at its core, although externally it still runs at the standard 3.3V.

The Tecra's other distinguishing feature is its 13.3in TFT screen, which pretty much fills the available lid area and is as big as screens are going to get without abandoning the A4 format. The panel can operate at 1024 x 768 resolution, which is as far up as you can go without increasing the screen diagonal to produce a larger, more readable image. The only thing you could do to improve this impressive and usable screen would be to increase the colours it can handle, but the current

65,536 maximum is plenty for the reproduction of 24-bit photographic and rendered images without significant degradation.

Even taking into account dealer discounting of about 20 percent, the Tecra isn't exactly cheap, but it does pack a specification that puts plenty of desktop PCs to shame. The 166MHz MMX is backed up by 256Kb of pipeline burst cache and 16Mb of EDO RAM, and you get a voluminous 2.1Gb hard disk which is removable for easy storage, security, data sharing or even multiple OS usage.

In addition there's a ten-speed CD-ROM drive, integrated 16-bit audio with built-in

Contents

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- 93 Macromedia Flash
- 95 Cleansweep 3.0, PowerCleaner, Uninstaller 4.0
- 97 PowerQuest Partition Magic 3.0
- 97 Asymetrix WebPublisher 1.0

Ratings

- ★★★★★ Buy while stocks last
- ★★★★ Great buy
- ★★★ Good buy
- ★★ There's a better buy somewhere
- ★ Buy it and weep

VNU European Labs



VNU Labs tests cover every kind of hardware and software. The tests are continually developed and enhanced to reflect hardware and software developments. Our tests closely simulate real-world use. For example, our suite of PC benchtests uses complete versions of industry-standard Windows 95 applications — currently Word, Excel, WordPerfect and FoxPro. We also run a graphics re-draw test using CorelDraw 6, and a Doom 2 frame rate test which is a good indication of games performance.

Application tests are the backbone of all the VNU Labs system evaluations but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as low-level tests) can reliably tell the difference. VNU Labs' system-level test



suite, Euromark, is mainly Windows-based and is used to isolate specific components like hard disks, graphics cards and CD-ROM drives.

● To make them easy to read at a glance, all graphs in PCW are drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the time in minutes and seconds to print a page in a comparative test of printers.



stereo speakers and microphone, and 2Mb of dedicated video memory allowing 16-bit colour operation at 1024 x 768 resolution. The finished product will incorporate a

28.8Kbits/sec modem with fax and voice capabilities, giving the Tecra full communications facilities. Expansion is provided by two Type II PC Card slots with fast 32-bit CardBus support and capable of bypassing the processor during video I/O operations to boost system performance in accordance with the Zoomed Video standard, and there's a high-speed IrDA 1.1 compliant (4Mbits/sec) infra-red serial port.

The floppy and CD-ROM module are interchangeable thanks to a multi-purpose bay in the front of the machine, and there's an adaptor for connecting up the floppy drive externally if it is needed at the same time as the CD-ROM.

We weren't too keen on the keyboard, which appeared to be the standard Toshiba offering and suffered from the usual lack of

solidity. The keytops were loose and the action didn't have much character or resilience. The baseplate sagged and bounced during typing, which jarred with the top-quality feel of the machine.

As this was a prototype it would be unfair to publish benchmark results, but all the indications are that the Tecra will be fast by notebook standards. Running time will depend on the application, but it looks like the Li-Ion battery will last for two to three hours with the higher figure needing just light use of the CD-ROM and audio features.

Dominic Bucknall

PCW Details

Price RRP £5869.13 (£4995 ex VAT)

Contact Toshiba 01932 828 828

Good Points MMX power, screen size, modularity.

Bad Points The keyboard.

Conclusion Outstanding presentation tool or power-graphics portable.

★★★★★

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Hardware

Armari Arcturus 200 MMX R3D

This machine is tailor made for big games players — if you've got the wallet to match, that is.

Armari says the Arcturus range is its attempt to create a PC as futureproof as possible. This model is aimed at the "high-end home user" — translation: keen games player — and is a real powerhouse, featuring an Intel 200MHz MMX processor, 32Mb RAM and two top-of-the-range graphics cards.

The Arcturus has a nicely styled mini-tower case which is easy to open. The interior is tidy and holds a Tyan Tomcat3 motherboard with the Triton 430HX chipset. There is 512Kb of soldered-on secondary cache and there are five ISA and four PCI slots (one shared), all of which can accommodate full-length boards. Two ISA and two PCI slots are filled, which still leaves plenty of room for expansion. There are two spare 5.25in drive bays and a mounting for an additional hard drive. The fitted 32Mb RAM occupies two of the eight 72-pin sockets which can support a huge maximum of 512Mb. However, the arrangement of the cabling and drive casings means that access to four of the SIMM slots is rather tricky. The motherboard supports USB and Armari says it will be supplying the sockets soon.

The hard drive is a 3.2Gb Quantum Fireball and the CD-ROM is a 12-speed Pioneer. Also supplied are a Diamond Supra Express 33.6Kbps voice modem, a Keytronics keyboard (nice action) and a Microsoft Intellimouse with the little wheel between the buttons. The audio side is well specified, with a SoundBlaster AWE 64 sound card and an excellent pair of Yamaha speakers. Considering the system is aimed at the games player, it's odd that Armari didn't see fit to include a subwoofer which adds a lot to the bangs, booms and crashes. A groovy space-age Creative Labs microphone is also supplied.

The Arcturus comes with the Matrox Millennium graphics card with 4Mb WRAM (upgradeable to 8Mb), a popular card in high-end systems. The Iiyama Vision Master Pro 17 is an excellent monitor and has a sharp display with bright, well defined colours and easy-to-use on-screen controls.

So far, so good. We've got a high-end machine with quality components that

Heaven for games players: the Arcturus 200 MMX R3D

should run anything you throw at it faster than a rat up a drainpipe. But why is Armari targeting the games player? The answer is the Orchid Righteous graphics card, based on the 3DFX Voodoo graphics chip. This is a dedicated 3D card with 4Mb EDO RAM that slots in alongside the Matrox Millennium. The Righteous 3D won the Editor's Choice award in our recent 3D Graphics Cards group test (*PCW January*) and produces spectacular results with specially written 3D games.

Software includes Windows 95 and a selection of 3D games (most of which are limited in some way) including Descent II, Mech Warrior 2, Fatal Racing 3D, Actua Soccer: Semifinals 3D, Scorched Earth, Hellbender, and Monster Truck Madness. Written for the Righteous card, they go like the clappers with all the details on full.

Even the most ardent games player has to return to the real world from time to time and, after all, what's the point of having a PC if all you're going to do is play games on it? It would have been nice to receive some

application software. As shown by the test results, it's too good a machine to waste on just games. But maybe I'll have just one more quick session before it has to go back...

Adam Evans



PCW Details

Price £2859.95 (£2434 inc VAT)

Contact Armari 0181 810 7441

Good Points It's full of high-quality components and goes like a bomb.

Bad Points A subwoofer and some application software would have been nice.

Conclusion A great machine if you've got the cash.

★★★★

Performance results

Windows 95 Office application benchmarks



Doom 2 benchmark (frames per second)



Armai Arcturus Panrix Thunder 200X

p75 >

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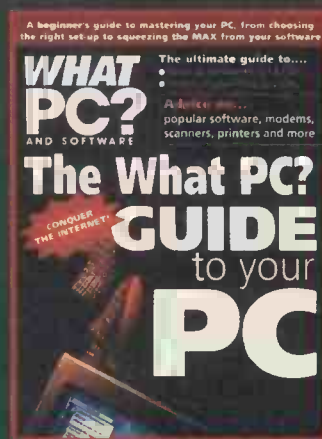
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Gordon Laing, PCW Magazine

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■ Hardware

HP Vectra XA

Corporate style and power are incorporated in this impressively endowed IT manager's dream.

Performance isn't usually a term associated with a corporate PC, but with the introduction of the Intel MMX chip, Hewlett-Packard appears to have moved in this direction. Add to this mix a raft of new features such as integrated LAN connectivity, internet software, a desktop management interface (DMI) and Universal Serial Bus (USB), and you find that the HP Vectra XA is a serious high-end corporate PC.

The Vectra XA we looked at is an IT manager's dream. It came with a Pentium 200MHz CPU with MMX technology, Matrox Millennium graphics card with 2Mb WRAM, Creative Labs SoundBlaster 16 sound card, 10/100 Base-T Ethernet Controller, 32Mb of EDO RAM, 512Kb L2 cache, 2.5Gb Quantum TM2550A EIDE hard drive, and Hitachi eight-speed CD-ROM. Our Vectra XA also came with an HP Ultra VGA 1280 17in monitor, but this isn't included in the purchase price.

The desktop case isn't small but it is sturdy. There's a simple set of sliding latches to allow for easy access to the interior. Inside there are four slots positioned on a vertical riser board: one ISA, one ISA/PCI and two PCI slots (one occupied by the graphics card). On the opposite side of the riser board is the network card supporting 10/100 Base-T connections. There aren't any USB devices available yet but HP has included two USB ports for a bit of futureproofing. The interior is cramped but well arranged.

Hardware is fine and good, but two concerns sweeping IT departments are Total Cost of Ownership (TCO) and remote management. According to a landmark study by the Gartner Group, the cost of running a single PC, after purchase, ranges from between £5,000 and £8,000 a year once helpdesk, training, and maintenance are factored in. Multiply this by several hundred or thousand PCs and you have a hefty IT cost.

HP is focusing its efforts to

address this issue with the implementation of its remote LAN support and integrated desktop management interface (DMI), called TopTools 2. Both of these are meant to allow a network manager to remotely audit and administer a PC via a LAN connection, thus reducing support costs. We were unable to test the full network functionality of these features but HP contends that an administrator should be able to turn on a PC, update software, re-flash the BIOS, run a remote hardware audit, and discover and troubleshoot any problems, such as potential hard drive failure, all from the comfort of their own desk. We did run TopTools 2 locally and were impressed with it. Everything, from CPU type and graphics card serial number to every IRQ and DMA setting, was scanned and available for analysis. As expected, there are built-in security features controlling conditional reboots and passwords.

HP has bundled Netscape Navigator 3.0 and Microsoft Internet Explorer 3.0, plus



TopTools 2 is for network administration and management



McAfee's Webscan and VirusScan 95 so the Vectra is fully internet ready.

On the performance side the Vectra XA has done well, scoring almost five times faster than our benchmark Compaq DX4/100. This is a respectable score when compared to a similarly specced, traditionally faster, high-end consumer PC like the Gateway 2000 P5-200 MMX PC which scored 4.79 in our Labs benchmark (*PCW March*).

Dylan Armburst

POW Details

Price RRP £2526.25 (£2150 ex VAT); with 17in monitor add £733.20 (£624 ex VAT)
 Contact Hewlett-Packard 0990 474747

Good Points Fast. Good remote management features.

Bad Points Nothing worth complaining about.

Conclusion Definitely a must-see for IT managers and budget makers.

★★★★

Performance results

Windows 95 Office application benchmarks

	4.77
	4.86

0 2 4 Faster

■ HP Vectra XA ■ Panrix Thunder 200X

Hardware

Toshiba SD-M1002 DVD drive

If you've been divided on DVD, these reviews should convince you they're the last word in drives

After all the talk, the first DVD-ROM drive has finally arrived in the guise of Toshiba's SD-M1002. For those few in blissful ignorance of DVD, it is a high-density version of CD-ROM, carrying up to 4.7Gb of data or a complete high-definition, multi-channel digital-sound movie. This new generation of drive is set to replace CD-ROM "sometime" in the next three years.

Since Toshiba believes that most first buyers of DVD-ROM drives will want to play movies, it is supplying the drive as a package with a PCI MPEG2/DVD video playback card. This particular drive was supplied with Quadrant's CineMaster DVD decoder card, still at the pre-production development stage.

The drive itself doesn't look much different to a standard Toshiba CD-ROM drive, the only giveaway being the DVD logo on the front and the extra DVD lead. Connections are absolutely standard ATAPI, and with Windows 95 is simply a matter of pulling out the CD-ROM drive and plugging in the DVD-ROM drive.

The DVD video card was only marginally more complex. The PC's monitor stays connected to the SVGA card and CineMaster feeds the video image to the SVGA card via the PCI bus. This does

mean that the PC must support PCI bus mastering and the SVGA board also has to support DCI, Direct Draw or DirectX compatible drivers — i.e. the current range of better 2D/3D cards.

Quadrant has loaded the back plane of the card with a stereo mini-jack for the audio and a choice of an S-VHS connection and a standard (composite) video out on a phono. As a pre-production sample it had no digital audio out, but the final version will have an SPDIF socket to extract the Dolby AC-3 digital audio stream for decoding into true digital 5.1 channels. All these extra outputs are absolutely essential: DVD video is only worth having if you are going to play it out of your PC and onto a decent-sized TV with a big surround-sound system.

From the desktop, the SD-M1002 functions just like any other ROM drive, the only nifty feature being when you load a DVD disc, the drive's desktop icon switches to the DVD logo. Put in an ordinary CD-ROM and it performs with the data transfer and access times of a seven-speed ROM drive. The only thing it won't do is play CD-R



discs. That will have to wait until

another generation of drive.

CineMaster came with no playback software, although a user interface to play all types of videodiscs will be supplied in the final version. A trusty Media Player brought the card to life, putting video on both the PC monitor, a TV and a surround system. On a limited range of software, the image quality on the TV output is pretty damn good with none of the "blocking" that makes MPEG1 sub-VHS quality.

The images are crisp and certainly close to the best laserdisc standard, but it was a different matter on the monitor — no blocking, but a very lined image due partially to the way Direct Drive scales the image for the VGA board. It proved a disappointment, as there was little obvious difference between DVD video and well encoded MPEG1.

Some of these problems may be sorted out by the release date (May) but it looks as though DVD video on the PC may have a rough ride in the early days.

Tim Frost

Hitachi GD-1000

Not to be outdone, Hitachi managed to get us a sample of its GD-1000 DVD-ROM drive just before we went to press. Like the Toshiba, it plugs into the PC with ease, simply replacing the existing ROM drive and using a standard EIDE controller. The two drives look much the same, the only overt differences being the GD-1000's slightly slimmer tray front and the use of just one LED to indicate that a DVD disc has been loaded.

The GD-1000 behaved impeccably on DVD-ROMs and, if anything, was marginally faster than the Toshiba on CD-ROM, although not enough to be significant in any real application. Like the

Toshiba, it came bundled with the CineMaster card to check the drive's functions with DVD-Video. Hitachi says it will not be selling an own drive/card package. Instead, it will supply the drive and leave it to others to create packages.

This version of the card came with marginally later drivers that seem to go a long way to resolving the line problem on the monitor view (the TV picture was still excellent). But that doesn't mean these types of cards are not going to be a bit unpredictable for some time to come, so again it's thumbs up for the DVD drive, but watch it on the decoder card.

Expected price £400

Contact Hitachi 01628 585000

PCW Details

Price Drive £400; Drive/MPEG2 card £800 (estimates only)

Contact Ideal Hardware 0181 289 5000

Good Points Be first on the block with DVD.

Bad Points Nothing to play on it yet.

Conclusion Marks the start of DVD-ROM, and stops you having to shell out a further £600 on a DVD-Video player. Best to wait till the autumn for the drives to settle down in price and the teething problems with the cards to be sorted out.

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Hardware

Sony DSC-F1 & DKC-ID1

The undisputed master of consumer gadgetry is spot on with these digital cameras.



You wait ages for a Sony digital camera to arrive, then two come along at once. To be honest, the higher-end DKC-ID1 beat the consumer DSC-F1 by a few months, but I won't let that get in the way of a cliché.

Sony has two very distinct styles and these cameras are perfect examples of each. Shouting consumer gadgetry all over the place is the DSC-F1, while the DKC-ID1 conservatively assures the serious user and heralds from Sony's Broadcast and Professional UK Division.

The £1,499 DKC-ID1 is a large, flat camera weighing 750g with the supplied rechargeable battery, measuring 128 x 65 x 145mm and shaped not unlike Kodak's DC-50. Like the DC-50 it features a motorised zoom lens, but Kodak's three times is easily beaten by Sony's huge 12 times, a range equivalent to a 38–460mm zoom on a 35mm film camera. You'll need to hold steady when completely zoomed in, and bear in mind the built-in flash is only effective over small distances. Sensitivity is equivalent to 100 ASA (ISO) film.

The viewfinder is a colour LCD, similar to the ones found on camcorders, and despite flickering, indicates exactly what you're going to get, or already have got. In use the DKC-ID1 feels much like a cross between a still camera and a camcorder. Focus and exposure are manual or automatic, with shutter speeds between 15th and 4000th of a second. Closest focusing distance is 0.8m at any zoom setting.

Resolution is 768 x 576 pixels and the

quality's good. Images are stored in JPEG format on Type-II PC (formally PCMCIA) Cards, with either 42 or 158 stored per 10Mb memory depending on compression. TWAIN-acquiring drivers are supplied for Win95, 3.x and Mac, and images can be transferred by physically removing the card or connecting to the built-in SCSI-II interface.

Moving swiftly on to the utterly gorgeous DSC-F1, which immediately wins over anyone who has a go with it — Sony really is a master at consumer gadgetry. It measures 102 x 78 x 41mm, weighs 135g with its supplied rechargeable battery, and is finished in a lovely silvery coat.

Like the Casio cameras, Sony's DSC-F1 features a lens section which can rotate through 180 degrees for self portraits, or at its halfway position is handy for shooting at low heights. Also like the Casios, the Sony features a colour LCD screen on the rear for composing or reviewing images. Unlike the Casios, the Sony boasts a flash, built into the rotating lens section and operating between 1m and 3m. Do bear in mind that LCD panels drain batteries very quickly.

The autofocus lens is fixed focal length, equivalent to 35mm on a 35mm film camera. A macro mode will focus as close as 0.08m. Image resolution is 640 x 480 pixels, and the 4Mb built-in memory can store either 30, 58 or 108 pictures at the three levels of JPEG

compression. Image quality is as good as the best 640 x 480 pixel cameras we reviewed in our February group test.

Sony has also taken the lead in terms of connectivity. The DSC-F1 features a serial port for wired links to PCs or Macs, an IrDA compliant infra-red port, and even a



composite video output for display on TV or video — you could use a DSC-F1 and TV for presentations. Particularly cunning is the £400 optional dye sublimation mini colour printer, which produces 6in x 4in prints and talks to the DSC-F1 by infra-red.

At £595, the DSC-F1 is considerably more expensive than other 640 x 480 pixel LCD viewfinder cameras, but knocks them all into a cocked hat in terms of quality, features and sheer good looks. It is simply adorable and comes highly recommended. The DKC-ID1 can't compete in looks, but offers excellent quality and a huge range of options — ideal for the more serious user.

Gordon Laing



PCW Details

Sony DSC-F1

Price RRP £699.12 (£595 ex VAT)

Contact Sony IT Group 0990 424424

Good Points Great design, features and quality.

Bad Points Pricy compared to its (inferior) competitors.

Conclusion The best consumer digital camera.

★★★★★

Sony DKC-ID1

Price RRP £1761.32 (£1499 ex VAT)

Contact DirekTek 01494 471100

Good Points High quality, large zoom and advanced facilities.

Bad Points Not particularly user friendly.

Conclusion Better suited for pro applications.

★★★★



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Hardware

Epson Stylus 800 and Stylus 600

Fine colour output distinguishes both these printers, ideal for small business and home use.

These two printers are the latest additions to Epson's Stylus range, replacing the Stylus Pro and the Stylus 500 respectively. Epson has upped the colour dpi output from the previous maximum of 720dpi, to 1,440dpi. Both models are dual-cartridge four-colour printers.

Costing less than their predecessors, these latest printers show a marked improvement in colour output. The increased dpi is due to a refinement of the Micro Piezo printhead, which forces the ink out faster and in smaller droplets, and a new driver, which employs AcuPhoto Halftoning. The new Quick Dry Ink is worth a mention, as it really does live up to its name.

Epson promises that these printers deliver crisp, laser-sharp mono text and they do, but only when using 720dpi coated inkjet paper. At this resolution, one page took almost a minute to print, and the paper costs 12p (RRP, inc VAT) per sheet. On plain photocopier paper, text was blurry and feathered with noticeable ink bleed. But if you're looking for colour output, these printers produced excellent colour images.

The Stylus 800 is aimed at the high-end SoHo market but will be most applicable for small businesses. It's more stylish than its predecessor, the Stylus Pro, and has a footprint of 630mm x 470mm with the paper trays fully extended. It is network capable — an ethernet cable will set you back



£359 (RRP, ex VAT) — and has a data transfer rate of 1.8Mbps/sec.

The single motor previously used has been replaced with three motors, and what a difference this has made. The 800 lapped the Pro in the text/speed test, performing an incredible 32.65 seconds faster when printing ten pages. The motors do make this a noisy printer, definitely not the sort you'd want work close to. Even a print run of ten pages will drive staff in a small, crowded office up the wall.

The colour images produced by the Stylus 800 are excellent whether at the full 1440dpi on glossy film or at 720dpi on coated inkjet paper. At 1440dpi the image is marginally cleaner and sharper, better capturing the fine details, and obviously the glossy paper makes images look much more impressive. But if you are on a budget the coated paper images are still startlingly crisp, either at 720dpi or 1440dpi.

The Stylus 600 is more suited to professionals who work from home and comes bundled with Sierra Print Artist and Adobe Photodeluxe, along with an extra 100 photos and 25 fonts. The data transfer rate has been increased to 900Kbits/sec. It's quieter than its big sister, the Stylus 800, so it won't wake the baby.

Despite the extra nozzles in the printhead, the Stylus 600 performed about the same as the older Stylus 500 in the text/speed test. A full-page colour photo took almost thirteen minutes to print

at 1440dpi on glossy film. The paper feed has been improved and now ejects sheets smoothly, without sticking.

Epson printers are fussy when it comes to paper, and for best results it's advisable to use Epson's own brand paper. Photo Quality Inkjet paper costs £12.33 (£10.49 ex VAT) per 100 sheets, and Photo Quality Glossy film costs £27.01 (£22.99 ex VAT) per 15 sheets. New on the market, Photo Quality Glossy paper falls somewhere between the two in quality and price. Cartridges cost £19 (RRP, ex VAT) for three colour, and £18 (RRP, ex VAT) for three black.

Lynley Oram

PCW Details

Stylus 800

Price RRP £480.58 (£409 ex VAT)

Contact Epson 0800 289622

System Requirements Windows 3.1, 95, NT; Macintosh. Emulation: Epson ESC/P2, IBM X24E, Epson Remote, PostScript Level 1 & 2.

Good Points Good colour, quick-dry ink, easy to use, stylish.

Bad Points Far too noisy.

Conclusion Perfect for doing presentation documents on.

★★★

Stylus 600

Price RRP £329 (£280 ex VAT)

Contact Epson 0800 289 622

System Requirements Windows 3.1, 95; Macintosh. Emulation: Epson ESC/P2, Epson Remote

Good Points Quiet, quick-dry ink, easy to use.

Bad Points Doesn't print crisp black text on plain paper.

Conclusion Not bad for a home printer. Could be useful for printing colour newsletters and the like.

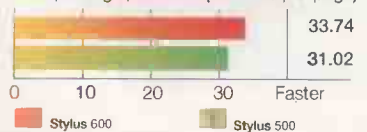
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Performance results

Text printing speed test (seconds per page)



Text printing speed test (seconds per page)



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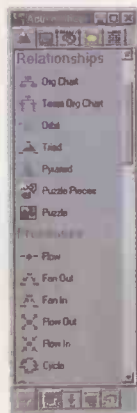
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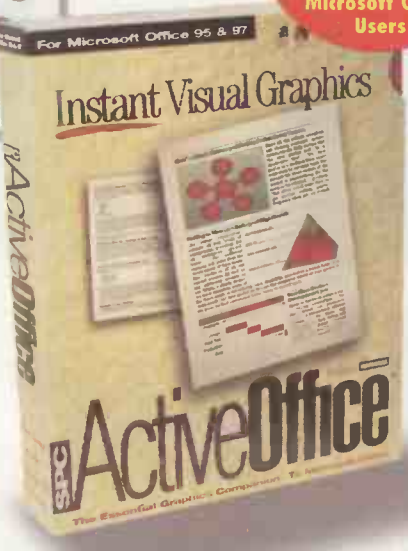
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www.jobnet.vnu.co.uk

Hardware

Lexmark 2030 Jetprinter

Lexmark's "hexacolour" technology is a feature of this printer, but performance is disappointing.

The latest addition to the Lexmark stable fits neatly in beside the 1020 Jetprinter (reviewed in *PCW* November 1996) at the lower end of the company's printer range. The difference between them is that the 1020 is a single-cartridge printer, while the 2030 is a dual-cartridge printer. Unlike other printers of a similar price range, the top resolution of the 2030 is only 600 x 300dpi, which some may feel is a little low.

Setting up is relatively easy. You need to align the printheads when installing the drivers, or your prints will end up running off the edge of the paper.

The main development has been in the type of cartridges used. The 2030 uses a technology which Lexmark has named "hexacolour". This basically uses two cartridges — one standard CMY colour



cartridge, and a black cartridge with two extra wells for diluted cyan and

diluted magenta. These added colours are intended to import pastel shades, so are better for sky and skin tones, details and highlights. Unfortunately, this new technology does little to enhance the printer's performance. The output in photographic mode is distinctly dull and lacks smoothness and crispness. To add insult to injury, a full-page colour

photograph came out with banding, the same fault repeating no matter how many times we printed it.

In graphics mode for illustrations, however, the output is much better. But be warned: the ink does take some time to dry, and although there is a box in the drivers for a "dry time delay", if you want to print quickly the ink will smear and bleed and the paper will be very wet.

Adele Dyer

PCW Details

Price SRP £200 (£235 inc VAT);
Street £199 (£169.36 inc VAT)

Contact Lexmark 01628 481500

Good Points Good, bright colours in graphics mode.

Bad Points Ink slow to dry, occasional banding.

Conclusion Not Lexmark's best printer.

★★

Yamaha SW60XG



This daughterboard really does make sweet music, taking wavetable synthesis to a new level.

Daughterboards offering wavetable synthesis are nothing new. By fitting one piggy-back style to an existing sound card, MIDI playback is elevated from the embarrassed efforts of FM synthesis into the rich and realistic realms of sampled sounds. At least, that's the theory, but unless the existing sound card has a suitable connector, a wavetable daughterboard can't be used. The solution used to lie in chucking the old sound card away and buying one that either had a daughterboard (or "waveblaster") connector or wavetable synthesis built in. Yamaha has now provided a neat alternative in the shape of the SW60XG.

The SW60XG is based on Yamaha's enormously successful DB50XG wavetable daughterboard but has a cunning twist. Rather than fit physically onto an existing sound card, the SW60XG is a 16-bit ISA card and so only needs a vacant slot.

The half-length SW60XG isn't for games players — it doesn't offer FM synthesis or SoundBlaster emulation and has no MIDI/joystick port. This does mean, however, that it doesn't need an IRQ or DMA channel, so installation is extremely straightforward.

The SW60XG (like the DB50XG) uses Yamaha's extensions to the GM (General Midi) standard, called XG. XG is upwardly compatible with GM but offers improved voice editing, sophisticated effects control and a larger set of voices — anything from 480 up, and the SW60XG has 676. XG supports real-time effects for external inputs and the SW60XG has three 24-bit DSPs.



The sound quality of the SW60XG is nothing short of excellent. Its 4Mb of wavetable ROM and 18-bit D-to-A converters make for impressive playback even with standard General Midi pieces. With a custom XG MIDI piece, however, wavetable synthesis is taken to a new level. A CD-ROM sampler of XG MIDI pieces ranging from the Eurythmics to Jimi Hendrix is supplied, and vocals aside, playback is almost indistinguishable from the original.

Julian Prokaza

PCW Details

Price £149 (£126.80 ex VAT)

Contact Yamaha 01908 366700

Good Points Simple installation, sound-card independent, fantastic sound.

Bad Points None.

Conclusion Superior wavetable sound simply cannot be had for this price. Superb.

★★★★★

p85 >



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BETA

Dr. Solomon's HomeGuard

This inexpensive cut-down version of Anti-Virus Toolkit will bite the bugs for Windows users.

Dr. Solomon's is well-known for its Anti-Virus Toolkit, widely regarded as one of the leading anti-virus products. But the Toolkit is expensive compared to many rivals aimed at the home market. To address this, Dr. Solomon's has launched HomeGuard, a cut-down version which sells at an attractively low price.

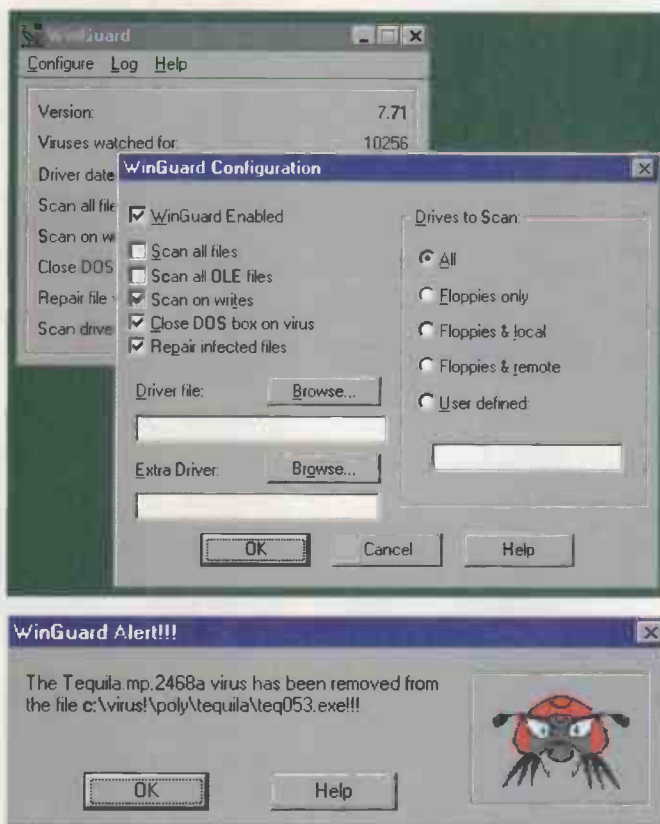
Most anti-virus products, even budget ones, have two separate components: an on-demand scanner that you run when you want to check for viruses, and an on-access checker that runs in the background and ensures that each file is virus-free before you load it. The advantage of the on-access checker is that it's automatic, so there's no risk of loading a file which hasn't been virus-checked.

However, HomeGuard doesn't include an on-demand scanner (virus-savvy readers, throw up your hands in horror). The result is that

HomeGuard users have no way to overtly check that the file they were given by a friend, or downloaded from the internet, is free of viruses before they use it. In practice, this isn't as bad as it sounds because HomeGuard's on-access checker, WinGuard, is every bit as effective as a top-class on-demand scanner and won't allow you to load or run an infected file.

WinGuard works only while Windows is running, so if you boot to DOS your system may have no virus protection. The package does include VirusGuard, an on-access DOS virus checker, but this isn't the ideal solution for the home user and it's not as effective. The memory it consumes may not leave enough available for some games to run, so users may be reluctant to install it.

WinGuard's only interface is a status panel (normally hidden) from which you can



Top WinGuard's interface consists of a couple of configuration dialogs that you'll rarely need to touch

Bottom With the automatic repair option, this is all you see when you load an infected file

access a couple of configuration dialogs. These enable you to change the text of warning messages, specify what disks and files are scanned, and choose whether to log detected viruses to a file. One option, to scan on writes, should be the default, especially for those with internet access as it allows infections to be detected when files are extracted from email messages and ZIP archives. Configuration changes take effect only after Windows has been restarted: fortunately, the options are not things you will need to change very often.

At installation time you must choose whether or not you want WinGuard to repair infected files on the fly. With this option, all you will normally see when you load an infected file is a message telling you that virus X has been removed from file Y. This is a particularly convenient way of dealing with

Word macro viruses. In tests, WinGuard cleaned nearly all of our virus samples and almost 100 from a larger sample of more than 600 types. However, some of the cleaned files weren't repaired to their original state, and a few crashed when run.

The problem of imperfect repairs is one that affects most anti-virus products, though those that use integrity checking (which WinGuard doesn't) generally do a better job. WinGuard's repair facility is worth having but deleting the infected file and then restoring a clean copy from a backup is a safer option.

To clean up widespread infections and check out machines that won't load Windows, HomeGuard includes the Magic Bullet, a bootable disk containing a DOS virus scanner. You put the Bullet in drive A, reboot the PC, and choose an option to scan only, or scan and repair the system. In the absence of an on-demand scanner the Magic Bullet is the only way to check your entire

hard disk for viruses. It's also an extremely easy and foolproof way to clean an infected PC. Note, though, that the version we tested did not support the new FAT32 file system available in some versions of Windows 95.

Julian Moss

POW Details

Price £29.95 (inc VAT); one free upgrade included
 Contact Dr. Solomon's Software 01296 318800
 System Requirements Windows 3.1 or Windows 95.

Good Points Automatic. Easy to use, top-class virus detection.

Bad Points No on-demand scanner. Limited DOS support.

Conclusion Inexpensive, effective virus protection for Windows users

★★★★

p86 >

Software

Borland Delphi 3.0



ActiveX and other new features make this a more attractive Windows development tool.

The heart of Delphi is its Visual Component Library, or VCL, a Pascal class library that encapsulates the Windows API (Application Programming Interface) into a series of components which you can snap together visually. Delphi components perform well and can easily be enhanced using standard object-orientated techniques.

In the past, the only problem with Delphi components has been that they only worked in Delphi. Now, a new ActiveX Control expert lets you convert a VCL component. So, you can take a Delphi component, make it into an ActiveX control and use it in Visual Basic, Word, Internet Explorer, or any other ActiveX client. An enhancement to the TOLEComponent now allows you to display ActiveDocs or DocObjects, another key ActiveX feature.

Ironically though, one of Delphi's best features has also proved to be a weakness. Unlike Visual Basic, a Delphi application compiles into a standalone executable that does not require runtime support files. It simplifies distribution and version control but makes for large executables because substantial chunks of library code are bundled into them. However, Delphi 3.0 incorporates packages. In our tests a simple application which compiles to 200Kb without runtime packages, reduces to 11Kb when packages are used. Larger applications benefit less but you can create your own packages if you want to share runtime components between apps. It also speeds compilation and saves resources at runtime.

ActiveX and packages are the two major new Delphi features, but there are other enhancements. Although it was not working

properly in this beta, an Access driver has been provided for the database engine. Judging by its name, IDDAO32.DLL, it calls Microsoft's JET engine through Data Access Objects. There is support for

a thread-safe list.

There are some changes in the editor, too. An "Evaluation hints" debugger option displays the value of any variable or property as tooltips in the editor window. A keystroke combination in the editor summons pop-up code templates which automatically enter common structures like "while" statements and exception blocks. Assertions have been added to the language, a welcome debugging enhancement. Net

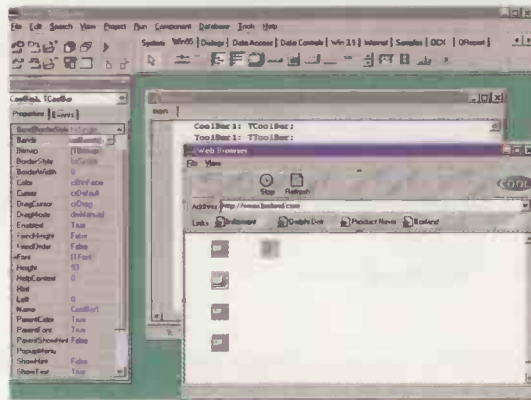
developers will find new components for developing web server applications like those which generate HTML in response to database queries. Microsoft and Netscape servers are supported.

Borland has done the right thing with Delphi, bringing it fully into the ActiveX universe. Delphi's great strength is as an all-round development tool, combining visual development with low-level language features when required, but it is not necessarily the best choice for client-server development. For general-purpose Windows development, though, Delphi does look increasingly attractive.

Tim Anderson



Above Selecting the ActiveX tab for a new project shows a full range of options. **Left** The TToolBar component lets you create applications with the Internet Explorer look and feel.



FoxPro memo fields and CDX indexes.

Borland will no longer be developing ReportSmith, the unwieldy reporting tool previously shipped with Delphi, and has sub-licensed its development to a third party. The focus seems to be shifting to the bundled Quick Report, also a third-party tool but written in native Delphi. Both Delphi and the Borland Database Engine have new multibyte character features for international language support.

Several new components have been added. TToolBar has toolbars like those in Internet Explorer, and flat buttons which turn to 3D colour under the mouse. TAnimate shows an AVI animation. TSplitter creates splitter windows and TThreadList is

PCW Details

Price Learn To Program version £49.95 (£42.51 ex VAT); Standard version £89 (£75.74 ex VAT); Professional version £468.82 (£399 ex VAT); Client/Server version £1,526.32 (£1,299 ex VAT)

Contact Borland 0800 454065

System Requirements Windows 95, Windows NT 3.51 or higher.

Good Points Full ActiveX support. Runtime library option. Slick new components.

Bad Points Weak ODBC support. Not portable to other platforms.

Conclusion The best Windows development tool.

★★★★★



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Software

Adobe Persuasion 4.0

Be persuaded by this new version with cross-platform compatibility for presentation creators.

Persuasion will be familiar to Mac users, and the enhancements in this new version make it a worthy competitor to Powerpoint. A redesigned interface makes the job of creating presentations much easier by providing an environment consistent in appearance to other Adobe products like Photoshop. Persuasion now integrates well with other Adobe products, but this integration goes further than dropping in the odd picture from Photoshop. You can now work on a drag-and-drop basis with native files from Photoshop and Illustrator, so you can keep your layered images intact and there's no need to keep two copies of everything.

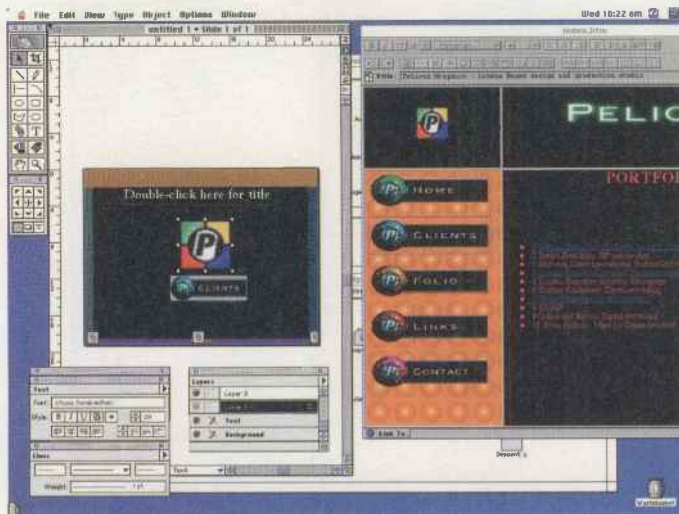
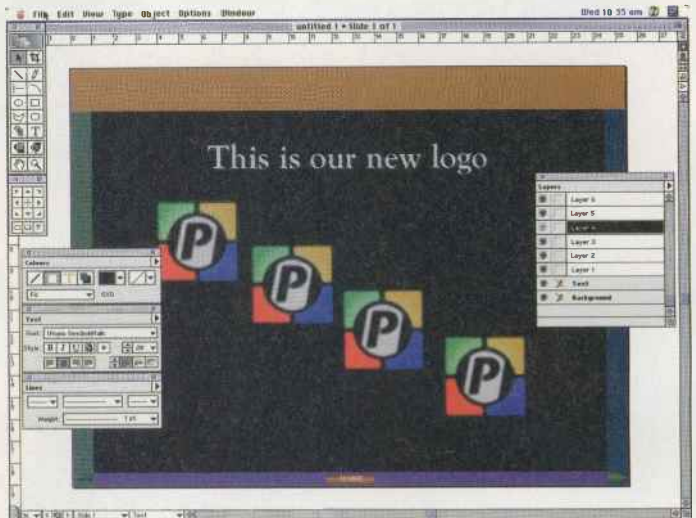
Persuasion is now web-friendly. Web-site authors who want to link pages with a Persuasion presentation can do so easily by dragging and dropping links and URLs from the title bar of a browser (or via Adobe's HTML authoring tool, PageMill) onto the text within a Persuasion slide.

Or, Persuasion presentations can be made internet and intranet accessible by converting them to Acrobat pdf format (Acrobat Distiller and the reader are included). Links management has been introduced to the Mac version and enhanced in the Windows version.

Working within Persuasion it is possible to create a straightforward, no frills 10-slide show in about as many minutes. Anyone who has used Powerpoint or other presentation packages will have no problems adapting. Small buttons in the upper right of the edit window take you into the outline view (key in the text for the whole presentation and slides are created

Right Floating palettes keep everything close to hand

Below Linked graphics are being pulled in from PageMill. The links are maintained when the Persuasion presentation is converted to a pdf document using Distiller 3.0



to style), the slide edit window (work on a page at a time), the slide sorter (thumbnails of everything), a preview of the current slide, and the player.

The edit window is where most of the creative stuff happens, so when this is selected half a dozen palettes become available. These provide control over everything from type size and colour to drawing tools, to layer control. But Persuasion falls a little short on effect and animation tools. The basics are there, but anything more sophisticated would have to be produced in something like After Effects and incorporated as a QuickTime movie.

Persuasion looks almost identical on the

Mac and the PC. Cross-platform operation is good, making it an ideal tool for a mixed platform environment or, say, where you want to create on a Mac but play on a PC. Adobe provides both versions with a dual licence so you can install it on both Mac and PC. You can even pass the second copy to someone else if you don't need it.

With its improved integration and multitude of new features, Persuasion 4 is well worth looking at, either for first timers or those wanting to upgrade. As an incentive to Powerpoint users to migrate, Adobe provides a Powerpoint-to-Persuasion conversion utility so you can, with a little tidying up here and there, pull in Powerpoint files and continue to work on them in Persuasion.

Ken McMahon

PCW Details

Price Street £222.08 (£189 ex VAT); Upgrade £81.08 (£69 ex VAT)

Contact Adobe Direct 0131 458 6842; www.adobe.com

System Requirements Mac, Windows 95 or 3.1.

Good Points Integration with other Adobe products. Dual Mac/PC licence. Cross-compatibility. Free Acrobat Distiller.

Bad Points Needs support of other Adobe products to create truly eye-popping presentations.

Conclusion An excellent choice, especially for those already using Adobe products.

★★★★

Software

Macromedia Flash



Add a flash of brilliance to your web-site animations or interface with this easy-to-use program.

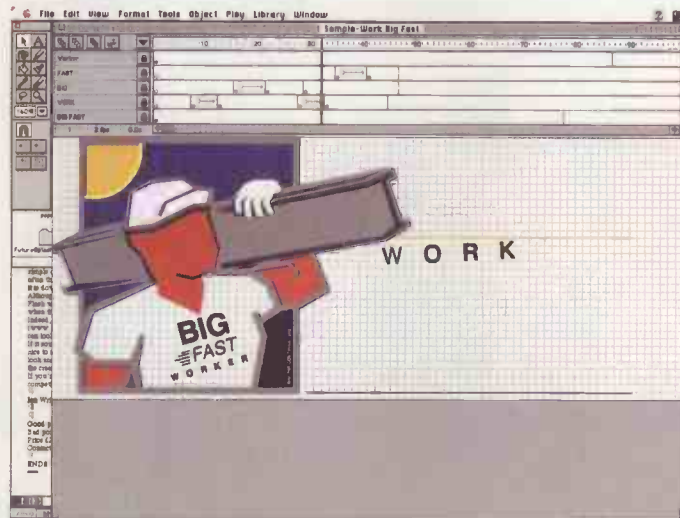
Flash has been around for a while in the guise of FutureSplash Animator. A buy-out by Macromedia should see this excellent product reaching a larger market.

Flash is designed to produce animations and interactive interfaces for web sites. But unlike many of its competitors, it is actually easy to use and the files it produces are remarkably small. Better still, the plug-in required to view Flash animations is less than 100Kb in size, so even the most churlish of web surfers shouldn't object too much to downloading it.

The program comes on a single CD-ROM which works on Mac, Windows 95 and Windows NT. The free Netscape Navigator /Internet Explorer plug-in works on Windows 3.1 machines but the authoring software doesn't. The standard installation includes the program and a set of interactive lessons, available at any time from the menu bar: a good idea, and one that's well executed; you can actually try out ideas from within the lesson as you work through a particular tutorial.

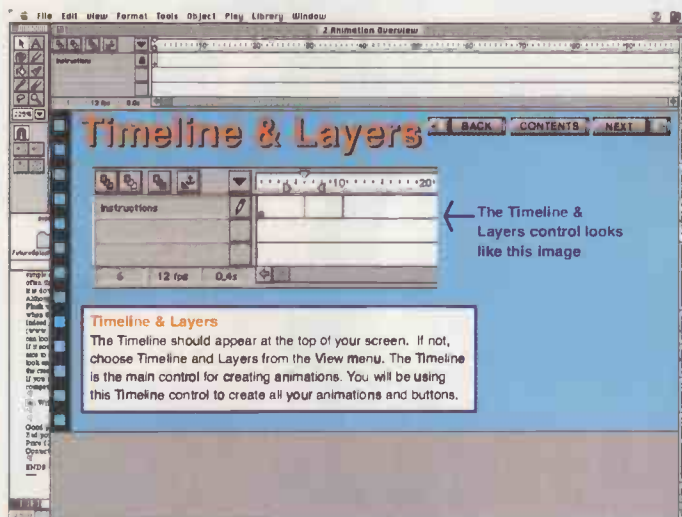
Creating an animation is relatively easy. The program's drawing tools are good, and although some work slightly differently to those with which you might be familiar, it doesn't take long to get the hang of them. Everything is a vector object in Flash, so it's editable at any time. Even when the finished piece is being played via your web browser, you can zoom in and out of the picture without any loss of resolution.

Flash has plenty of options to make life easy for an animator. It will interpolate (or "tween") between keyframes, and objects



Left A full drawing package is included so you don't need a separate illustration package

Below, left Flash includes a comprehensive set of well produced, useful, on-line lessons



can be set to move along a user-defined path. It also supports "onion skinning" several frames, showing a fainter version of the previous and next few frames, so you can see where the object was and where it is going to be in your animation. Many people are already creating simple animations using animated GIFs but Flash is a good alternative to those: often the Flash animation is smaller in size and, because it "streams", it starts playing as it is downloading rather than the viewer having to wait for the whole thing to appear.

Although the basic animation is good, it is probably in the area of interfaces where Flash will be most used. It's very easy to

produce things like pop-up boxes when the cursor passes over a given object, or buttons that highlight in sequence. Microsoft has already standardised on Flash for its MSN home pages at www.msn.com, and plenty of others are doing likewise. Flash-enabled home pages can look really good and the program makes creating them a matter of minutes.

If it sounds as though I am going over the top about this program, well, maybe I am. But it's nice to see a really great plug-in technology that could have a significant effect on the look and feel of the web, while remaining small and fast to download. The fact that the creation software is relatively easy to use only adds to its appeal. If you're creating web sites, you need a copy of Flash. And get one soon — your competitors will.

Ian Wrigley

PCW Details

Price £269.07 (£229 ex VAT)

Contact Macromedia 0181 358 5857

System Requirements Win95 or Windows NT.

Good Points Small player. Produces small animations. Easy to use.

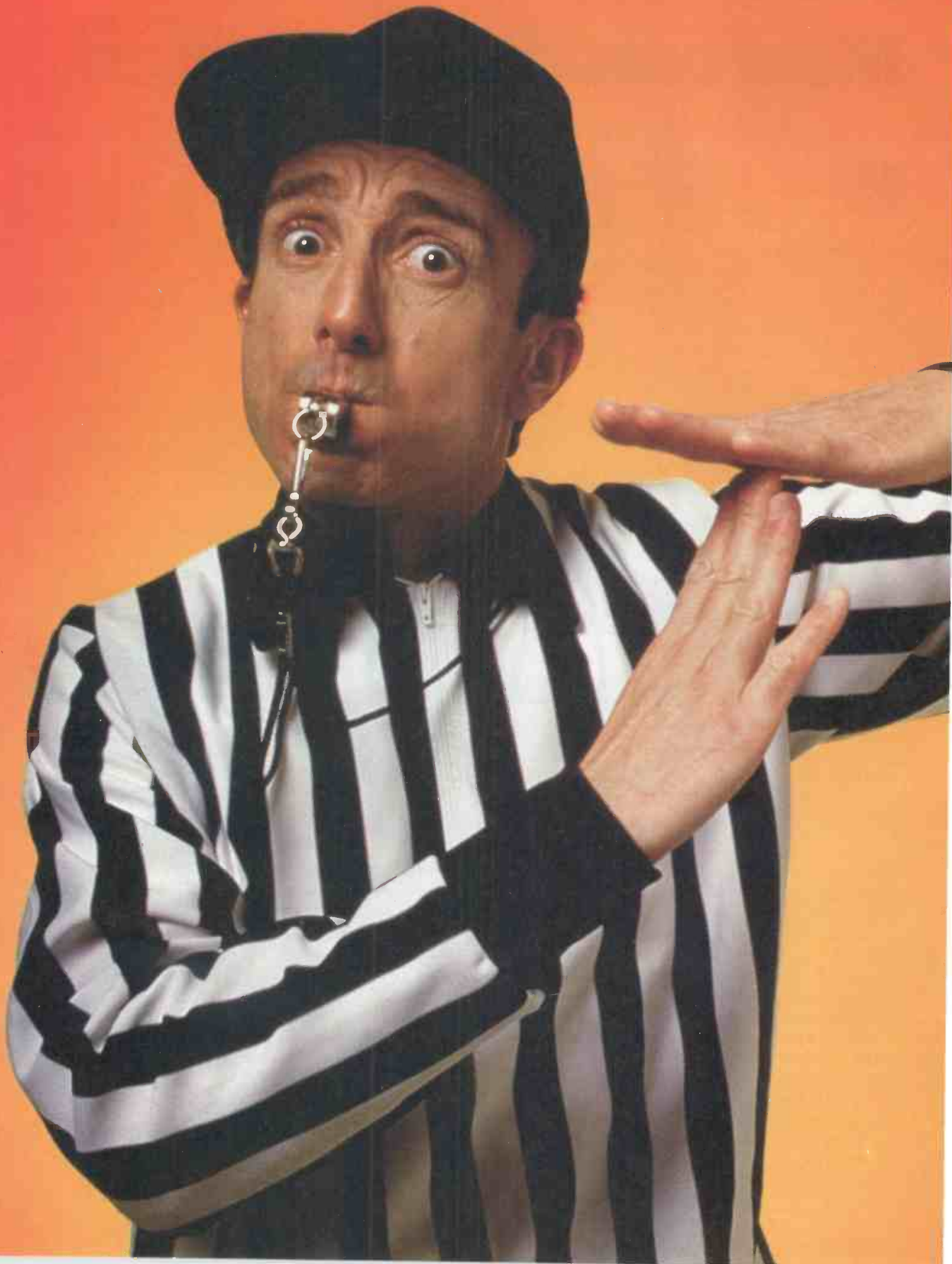
Bad Points Hard to think of any.

Conclusion Great plug-in technology that could have a significant effect on the look and feel of the web.

★★★★★

p95 >

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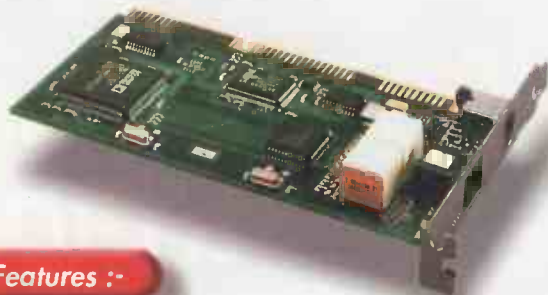
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Software

Three new uninstallers...

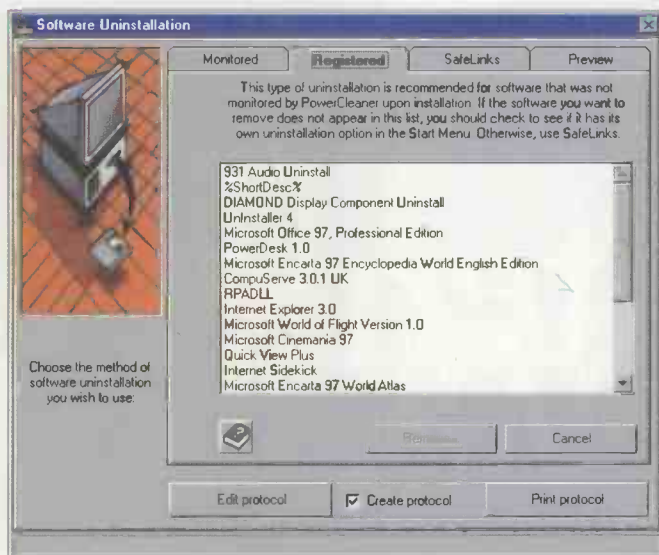
...to sweep clean with: Uninstaller 4.0, Cleansweep 3.0, PowerCleaner uninstallers compared.

A new feature in **Cleansweep 3.0**, Update-It, lets internet users access the Quarterdeck web site and download updates to the application Knowledge Base (and CleanSweep itself). An improved Install Monitor handles system changes as they occur.

CleanSweep employs a colour-coded system to guard against accidental deletion and insists on creating a backup. It performs all the usual move, archive and

Above PowerCleaner: Choose from registered software or monitored installations

Below Cleansweep's smart opening screen
Bottom Uninstaller 4.0 categorises all the files on your hard disk by type



where. Other new features include Group Delete, which lets you delete all the programs in a folder, and Self-extracting Transports, which allows applications transported as zip files to another PC to be extracted by double-clicking on the transported applications. There's a useful Backup Reminder which alerts you to old backups so you can delete them, and there is a new Undo facility which lets you restore an application at the end of an action. It has all the usual disk management features.

Overall, these products have different strengths yet all match one another. In the end, it comes down to personal preference.

Paul Begg

transport tasks. My only criticism is that once an application has been uninstalled, the uninstallation routine must be restarted to delete another application: irritating if you want to eliminate four or more applications or demos you'd downloaded from the net or taken from a magazine's cover CD.

Some uninstallers don't gather sufficient file location information, and uninstallation can be incomplete. But **PowerCleaner** goes through all the files on your hard disk at installation time checking their associations and is thus very efficient. Other than this, it is a fairly basic uninstaller. It will preview changes before they are made, so you have a chance to correct mistakes and it will undo them if any slip through. It has the usual optimisation tools: finding duplicate files, unused files, and adding or removing Win95 Files and Accessories.

Currently, **PowerCleaner** seems to be the most efficient uninstaller and is fairly versatile for hard-disk optimisation. Well worth considering.

Uninstaller 4.0 uses SmartLinks to scan your existing system configuration and identify the relationships of files, scanning the system three times faster than previous versions. A new automatic Installation Monitor generates a report so you can see exactly what changes were made, and

PCW Details

Cleansweep 3.0

Price £39.99 (£34.03 ex VAT)

Contact Quarterdeck Corporation 0645 123521

System Requirements Win95, Windows NT.

Good Points Fast. Easy to use. Internet updates. Version 2.0 included for Windows 3x users.

Bad Points The deleting process has to be restarted from scratch.

Conclusion A good choice.

★★★★

PowerCleaner

Price £24.95 (£21.23 ex VAT)

Contact DataBecker 01420 22707

System Requirements Windows 95.

Good Points Excellent file cleaning.

Bad Points Interface not as slick as the others.

Conclusion Well worth looking at, especially if price is a consideration.

★★★★

Uninstaller 4.0

Price £39.99 (£34.03 ex VAT)

Contact Roderick Manhattan Group
0181 875 4444

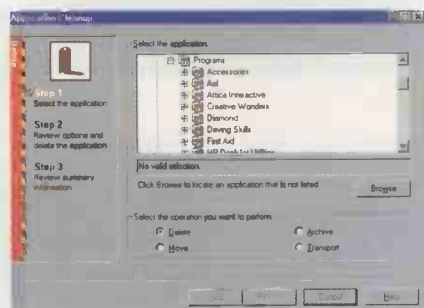
System Requirements Win95 or Windows NT.

Good Points Plenty of safety measures. Great automatic Installation Monitor and Report Generator.

Bad Points Perhaps rather slower than its competitors, but nevertheless quick to use.

Conclusion Uninstaller does an acceptable job and does it neatly and safely.

★★★★



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- Saul Klein, CEO, Firefly Network
- Heather Killen, Managing Director, Yahoo!
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Software

PowerQuest PartitionMagic 3.0

No sweat: Give your hard drive a work-out using this stable partitioning software.

Ironically, hard-drive utilities are often as likely to destroy your hard drive as they are to save it. But there are great advantages to partitioning. You can run different operating systems on your PC, or keep all your data in a 100Mb partition so you can backup to your zip drive with ease.

The benefit to a decent-sized drive is smaller partitions and smaller clusters. Essentially, the benefit of smaller clusters is that they make more space available; up to 40 percent more on an unpartitioned 1-2Gb FAT drive, according to PowerQuest, but the increase is markedly lower on non-FAT drives. PartitionMagic includes a comprehensive guide, which is essential if you're a newcomer to partitioning. Once you've read



this, the software is remarkably easy to use and despite several hours of creating, resizing, moving and deleting partitions of all shapes and sizes, together with installing multiple operating systems, it performed well and didn't fall over once.

Uninstaller Mover is included, which offers to clean up your files and attempts to simplify moving installed software from one partition to another. There is also

DriveMapper automatically updates references to changed drive names

DriveMapper, which tries to update references to drive names that have been altered. IBM Boot Manager and PQ Boot are included to help you to manage multiple operating systems on your PC.

Adam Evans

PCW Details

Price £70.44 (£59.95 ex VAT)

Contact POW! Distribution 01202 716726

System Requirements Windows 95, Windows 3.1, DOS 5.0 (or later) or OS/2 2.1 (or later).

Good Points Simple to use. Reassuringly stable.

Bad Points None really, but there's always a risk when you mess about with your hard drive.

Conclusion If you want to partition your hard drive, this is a great piece of software with which to do it.

★★★★

Asymetrix WebPublisher 1.0

Choose your options and create your own good-looking web pages without using HTML.

Many internet access providers offer free disk space for subscribers to put up their own web pages. But creating visually stunning web pages isn't easy because HTML code is more like the archaic computer languages of a decade or two ago than the slick visual programming tools you would expect nowadays: no wonder professional web-page designers can charge between £300-£600 a day! For this reason, a number of tools are available for creating your own web pages without having to delve into the intricacies of HTML. Among the latest of these is WebPublisher.

WebPublisher uses a questionnaire-type interface: choose from various options and complete the relevant boxes. In this way, you can design your web pages in six easy steps and, provided you have prepared your images and text beforehand, you could finish six pages in half an hour or so.



The program is on a CD containing different sets of theme templates, including header designs, banners, buttons and so on, with Java-powered graphic elements and buttons that highlight when you wave the mouse over them. There are 20 sets — not 20 individual templates — each containing different layout options. Having completed your pages, the application

Design your web pages easily by selecting options from the preset templates

converts them to HTML and transfers them to your net provider's site or web server.

WebPublisher is simple to use and the clip-art is of high quality. Asymetrix plans to release add-ons with more design themes, and tools for audio and video.

Panicos Georghiades and Gabriel Jacobs

PCW Details

Price £69.33 (£59 ex VAT)

Contact Asymetrix on 01923 208425

System Requirements Windows 95 or NT 3.51.

Good Points Cheap. Easy to use. Fast. Results have visual impact.

Bad Points Design limitations: it won't do everything.

Conclusion Good value for a small business or an individual.

★★★

Atlas round-up

Small world, innit? No, not really: there's a whole world of learning and information in these CDs.

Atlasses on CD-ROM are better than their paper-based equivalents. Not only do you get a good selection of maps, a gazetteer and lots of geographical and demographic information, but you can also hear native languages and national music, watch videos, and access more colour pictures than would be economical for a publisher to include in a book. There are many atlases to choose from, and each has its strengths and weaknesses. Prices also vary, ranging from about £10 to nearly £60.

natural and human-induced phenomena over time.

Map Pins let you add text and photographs, there are two ways of measuring distances, and there's a host of statistics in eight categories: Agricultural, Economic, Energy, Environmental, Global, People, Physical, and Transportation. There is a trivia challenge game called Around the World and a selection of projects called "20 Really Cool Things To Do".

Attica Interactive World Atlas

Click on the opening map screen to zoom in on the country that interests you. The best feature is the Suitcase, a storage area for add-on modules. These have to be dragged from the Suitcase to the menu bar before they can be activated. The Atlas contains three modules with additional ones on the way. The three modules include The World (spinning globes with statistical information like infant mortality or food consumed per person around the world) while Data has a glossary of geographical terms, a list of abbreviations, information about international organisations and a tool to calculate distance between places.

You can access multimedia: there are loads of photographs, most of impressive quality and covering various aspects of a country. A collection of UK photos include a Metropolitan Policeman and a traditional British pub, along with the more orthodox places of interest and beauty spots.

Compton's Interactive World Atlas

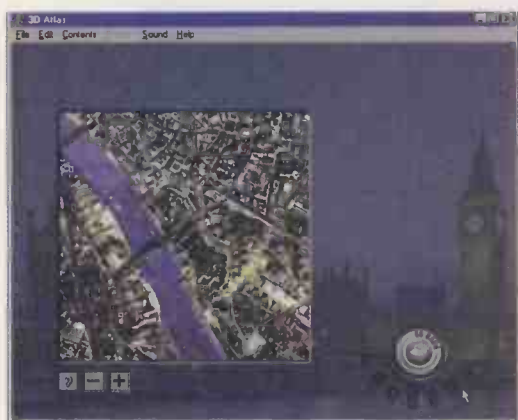
As the obvious competitor to Encarta, Compton's Interactive Encyclopedia at first

glance looked disappointing. The maps are lacklustre and the CD itself is unexciting to use. First looks can be deceptive, though, because Compton's is actually jam-packed. The information ranges from geopolitical data to statistics like birth and mortality rates, and GNP. Another section lists cultural information, plays national anthems and other music and provides a library of educational videos.

There are three types of map: political, showing the borders of each country; elevation, displaying the topography; and satellite maps, showing the earth from space. Most information is in the Profile section and is divided into categories and subcategories. The categories are Cultural Snapshot, Pictures, Movies, Music, Language and Olympic Facts. Statistical data covers everything from average household size to daily newspaper circulation.

Other sections look at natural phenomenon around the globe, some of the more common global weather systems, and time zones. There are plenty of pictures, good videos and animations. The 3D flight section lets you fly over a 3D-rendered representation of the Alps, the Rockies, the deserts of Australia — wherever you like!

Encarta 97 World Atlas World English Microsoft states that World Atlas is the most comprehensive atlas ever published, be it on paper or CD-ROM, and there seems no good reason to dispute the claim. There is certainly no question but that it is the best CD-ROM atlas you can buy. The maps are good and the magnification is excellent — at its highest resolution the map features over one million



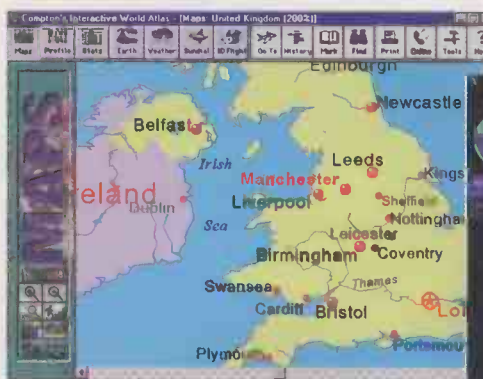
3D Atlas: Cities from space — in this case London, taken from a Russian spy satellite

3D Atlas

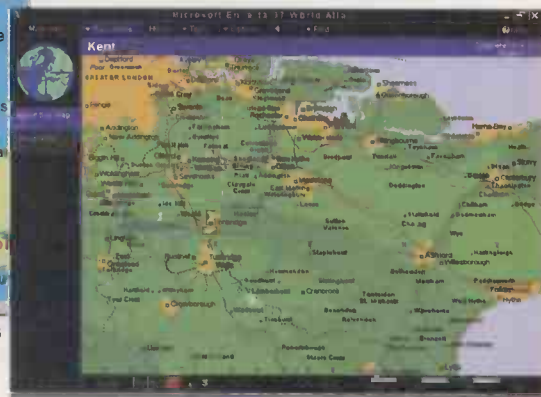
This is not so much an atlas as a computerised globe. Three Main Globes present environmental, physical and political views of earth and nine Other Globes each focus on a physical characteristic.

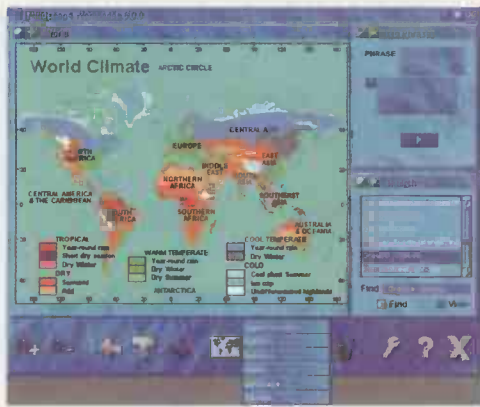
The Environmental Globe uses thousands of satellite photographs to show the earth as it appears from space. The Physical Globe looks at topography and the Political Globe displays international borders. Among the Other Globes, the Biosphere Globe shows changes in vegetation, and Continental Drift Globe displays the movement of the continents over 600 million years.

There are several Interactive Exhibits, among them a collection of satellite images of Bombay, London, Moscow, New York, San Francisco and Tokyo. Eleven environmental issues are studied in the Stories section and Time-lapse demonstrates the progressive effects of



Above Compton's: This is as detailed as the maps get Right Encarta looks good: its maps are very detailed and magnification is excellent





Mindscape World Atlas: It looks great and the maps are strikingly colourful

The core of this CD is a good gazetteer that is blindingly fast. Click on the map and the information in a text box changes instantaneously to the appropriate country, and there is a selection of phrases which you can hear in over 100 languages. The almanac is full of useful data, although it

place names, more than any other published atlas. The maps excellently render hues of green and brown "earth tones" to illustrate elevation — dark green represents areas below sea level, paler greens denote the lowlands.

There is a selection of map styles. The comprehensive map of the earth includes the items common to any topographic map: watercourses and water bodies, shaded contours, and elevations and depths measured with respect to sea level. The political map shows the political divisions, the physical map is divided into tectonic and natural features, the satellite map shows the earth by day and by night. The natural map displays eco regions, temperature and precipitation, and the human map depicts population and time zones.

Having chosen a country, you have a choice of articles including culture (articles about the people — their population, language, religion, greetings and gestures), lifestyle (family, diet and eating, social life, recreation, holidays and celebrations, commerce) and society (government, economy, transport and communication, education, health and welfare).

Altogether there are over 1.5 million words of text, more than 2,900 images, 350 world music selections and over 3,000 pronunciations. And, of course, it has been specially designed for the UK market.

Small Blue Planet — Real Picture World Atlas (v3.0.2)

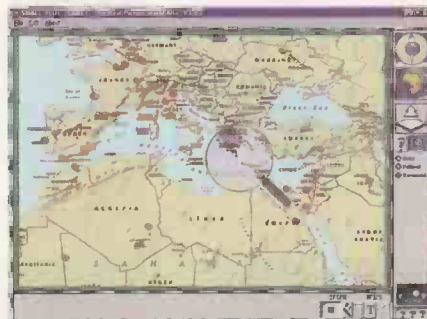
Real Picture World Atlas has been around for a while but is updated to take account of recent changes such as the new nations which have emerged out of the old USSR. It is a nice atlas offering various map views — political, relief and the recently added Hammond, none of which are very detailed. There's an Antarctica political map, a globe charting time changes, and a globe looking at earth from space. In the satellite gallery are photos of the earth taken by satellites and NASA aircraft.

hasn't been anglicised and some information, like the GNP, is given in US dollars: a big minus. As is the price. Given the quality of Encarta for the same money, this title needs to drop in price by at least £10.

World Atlas and Almanac 6.0

There are several types of map on World Atlas and Almanac 6.0: satellite, political, relief, language and climate. They are colourful and do the job, but they are let down by the poor magnification. Shame: the maps are what distinguishes an atlas from a gazetteer.

The almanac contains an enormous quantity of information, though not all of it is that easy to find. The detailed text includes land area, natural resources and endangered species, plus information about the people,



Small Blue Planet: A nice program, with a blindingly fast gazetteer, but a little overpriced

education, health, economy, crime, government, agriculture, communication, energy, diplomacy/defence, travel, and history. Pretty comprehensive coverage!

There are some useful tools, including a time and distance option which lets you specify two locations, then calculates the distance. A time and date button allows you to calculate the time anywhere in the world, and you can see the flag of a country and hear phrases spoken in the native language. A nice touch is the built-in notepad which lets you attach your own thoughts, ideas and memos to a specific map. There are pictures too, many of excellent quality, and videos of many cities.

Paul Begg

PCW/ Details

3D Atlas

Price £39.99 (£34.03 ex VAT)

Contact Electronic Arts 01753 549442

System Requirements Win 3x or Win 95.

Good Points Lots of information, interesting and fun to use.

Bad Points No detailed country maps and not up to date.

Conclusion A good educational tool for the study of the earth as a whole.

★★★

Attica Interactive World Atlas

Price £29.99 (£25.52 ex VAT)

Contact Attica 01865 791346

System Requirements Win 3x or Win 95.

Good Points A nice interface, reasonably detailed maps, and the add-on module idea gives scope for many uses.

Bad Points Nothing immediately springs to mind.

Conclusion A good-quality atlas.

★★★★

Compton's Interactive World Atlas

Price £39.99 (£34.03 ex VAT)

Contact The Learning Company 0181 789 5626

System Requirements Win 3x, Win 95, Win NT Workstation 4.0.

Good Points Packed with information.

Bad Points Poor maps and unexciting to use. Slight US bias.

Conclusion Could be better.

★★★

Encarta 97 World Atlas World English Edition

Price £49.99 (£42.54 ex VAT)

Contact Microsoft 0345 002000

System Requirements Windows 95.

Good Points Excellent maps, with superb detail.

Bad Points Windows 95 only.

Conclusion The best atlas you can buy, on paper or on CD-ROM.

★★★★★

Small Blue Planet — Real Picture World Atlas (v. 3.0.2)

Price £39.99 (£34.03 ex VAT)

Contact BTL 01274 841320

System Requirements Win 3x or Win 95.

Good Points Fast. Good selection of maps.

Bad Points American, expensive, and the maps could be more detailed.

Conclusion Good as a budget CD-ROM, but for an extra tenner you can have Encarta.

★★★

World Atlas and Almanac 6.0

Price £59.99 (£51.05 ex VAT)

Contact Mindscape 01444 246333

System Requirements Win 3x or Win 95.

Good Points Lots of information.

Bad Points The most expensive atlas reviewed here. Poor maps.

Conclusion A great gazetteer, but a poor atlas.

★★★

Space Station Simulator 1.0

What do you do if you see a space man? Park in it man! This CD is one giant step for DIY.

Construction of the International Space Station starts this year and it is due to be inhabited from mid-1998. Space Station Simulator lets you get one giant step ahead by creating a spacestation of your own, made from the components that will be used for the actual station. It is one of the first CD-ROMs to be written specifically for the Pentium MMX.

Designing the station involves sticking together modules into whatever formation you fancy — it's a bit like Lego but not as easy to use. There are detailed 3D graphics of all components which can be magnified and rotated with impressive smoothness. Despite being enhanced for the Pentium MMX, the movement of large assembled stations is jerky and the interior view is similarly afflicted. There is a series of locations with full 360-degree near-photorealistic views that are hotspotted to provide information when you click on them.

It's too easy to get disorientated when



The big yellow nodules show you where to stick your modules

you're moving around this CD. It may be a good reflection of the difficulties of space travel but it's annoying in software. With the green-on-black text, it means a lot of the information is hard to get at and to read.

Maris has included links to related web sites which are full of detailed information on the International Space Station. Once the thrill of building a station had worn off,

the web-based information proved to be more interesting. Space Station Simulator is being bundled with new MMX PCs, with the retail version coming out on 1st May. Maris says this will feature more technical information and a user-friendly interface. Unless the content is improved, you'd be better off putting the money towards a holiday in the 64-room hotel a Japanese company plans to have in space by 2020.

Adam Evans

PCW Details

Price £34.99 (£29.78 ex VAT)

Contact Maris Multimedia 01932 781108

System Requirements Windows 95.

Good Points Some impressive graphics.

Bad Points A frustrating interface and poor use of sound.

Conclusion Worth a look if you're really fascinated by the International Space Station and don't have a web connection.

★★

The Genius of Edison

A guide to the life and work of Thomas Edison, in the style of his era and related happenings.

The Genius of Edison is part of Compton's Home Library series and is a comprehensive guide to the American inventor, Thomas Edison. The design mimics the typography of Edison's era and follows the theme through by using lots of sepia tints, old black-and-white photos and silent-movie footage. While a lot of video has been used, the makers have also incorporated animated photos and drawings à la Monty Python, injecting a bit of fun into the CD and making it enjoyable to use.

Edison seems to have been responsible for an enormous number of successful inventions, so it's heartening to discover that he also came up with a few real turkeys, such as his talking doll. Inside each doll Edison placed a phonograph, and marketed the toy as the Buzz Lightyear of Christmas 1890. Unfortunately he didn't invent bubble wrap, and 99 percent of the phonographs



The phonograph, Edison's most famous invention, made modern stereos possible

broke during transportation.

In order to make his inventions work and to earn wads of cash, Edison also had to come up with all the associated bits and pieces we take for granted. If you want to sell the idea of electric lighting you'll have to produce power stations, wiring, fuses, switches and, of course, meter boxes.

What makes this title work is the way it

places Edison's life and works within an historical and social context. A nifty Timeline charts the life and times of the man and his family along the bottom of the screen, while charting what was happening in the world across the top. This includes events like the discovery of penicillin, the invention of the telephone, the publication of *The Wizard of Oz*, and World War One.

Lynley Oram

PCW Details

Price £29.99 (£25.52 ex VAT)

Contact The Learning Company 0181 246 4000

System Requirements Win 95, 3.1 or Macintosh.

Good Points Great layout. Jam-packed with facts. Puts Edison's work in the context of his era.


Bad Points The music — saloon-bar piano.

Conclusion A nice way to explore history

★★★★

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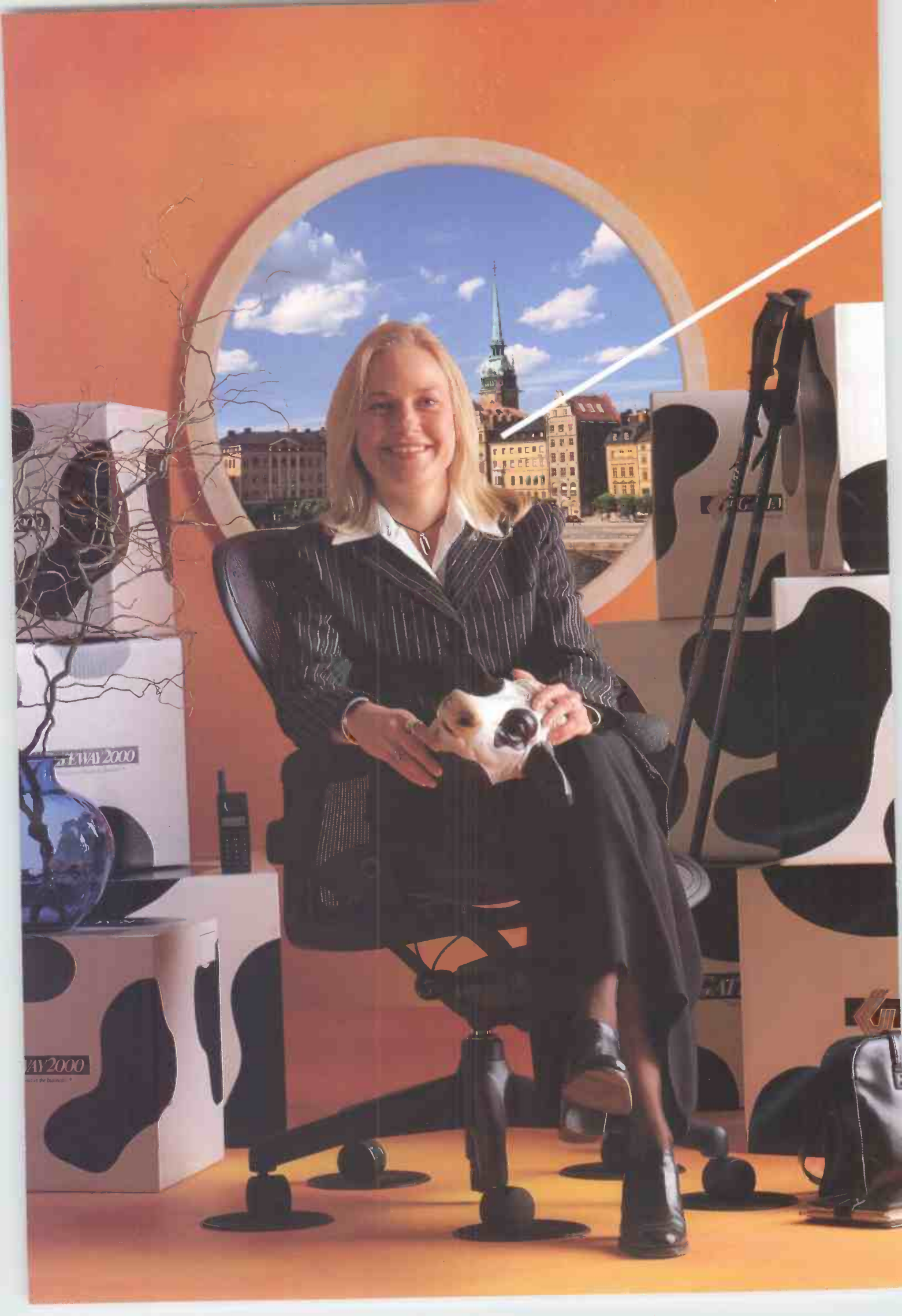


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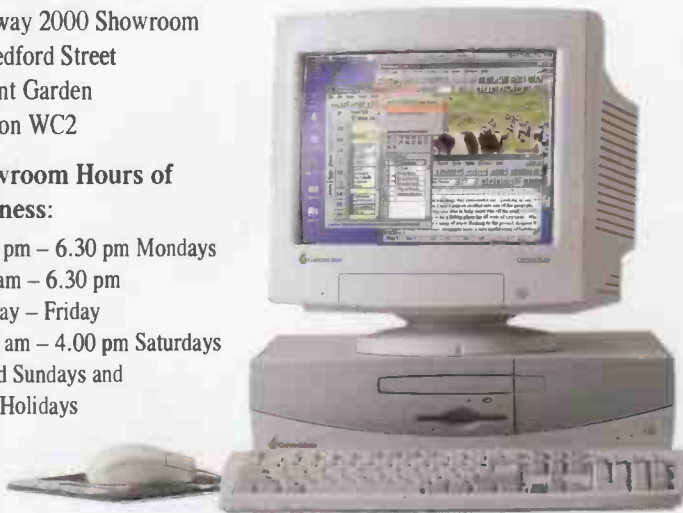
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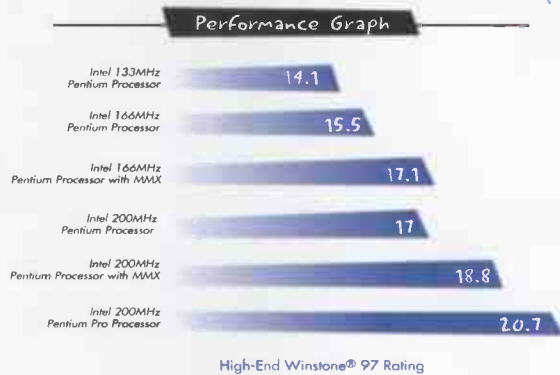
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► Ziff-Davis' Winstone 97 Version 1.0 produced scores of 14.1; 15.5; 17.1; 17; 18.8 and 20.7 Winstone Version 1.0 units on its High-end Winstone 97 suite on Gateway 2000. PCs configured with 166MHz Intel Pentium Processor with MMX technology, 200MHz Intel Pentium Processor with MMX technology, 180MHz Intel Pentium Pro processor and 200MHz Intel Pentium Pro processor, respectively. All Gateway 2000 PCs tested featured 32MB RAM, 256K RAM cache, 3.8GB hard disk, IDE controller, FAT file system, and no hardware disk cache. Systems include S3 VIRGE/VX graphics adapter, with 4MB VRAM with v.1.23m3 driver, 1024x768 with 256 colours, and a refresh rate of 75Hz. Test systems use MS DOS 7.1 and MS Windows 95. All products used in the test were shipping versions available to the general public, and the test and its results were not verified by Ziff Davis.

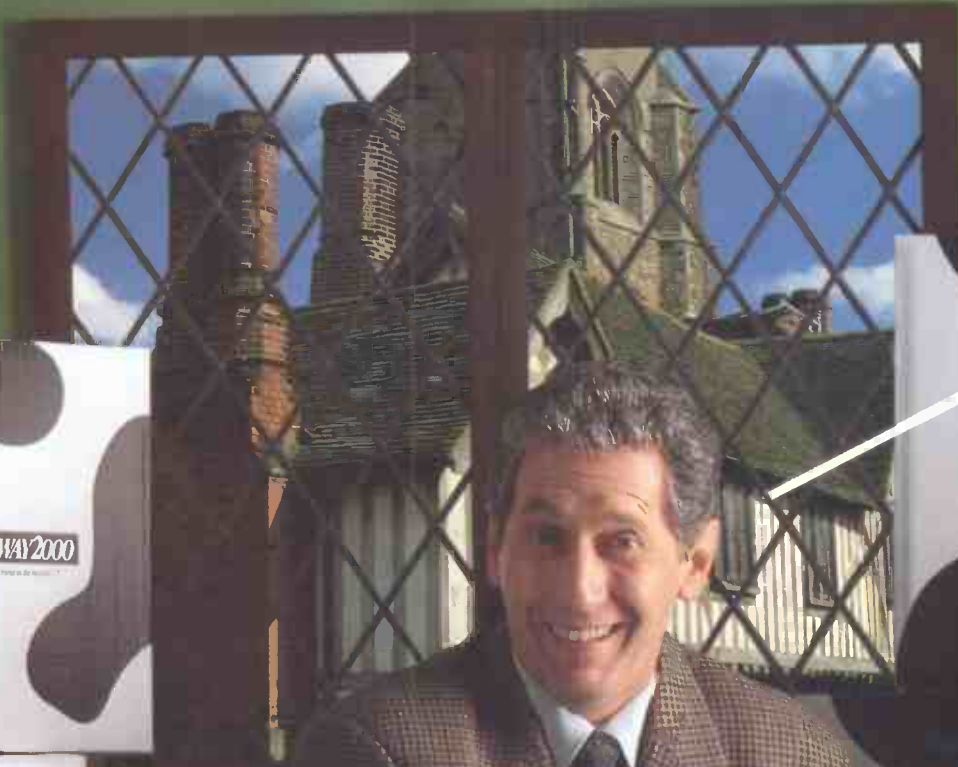


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Software

The Simpsons Cartoon Studio

Doh! Don't be an "under-achiever and proud of it". Get cartooning with Homer, Marge & Co.

Calling all Simpsons fanatics. Have you seen every episode one hundred times over? If so, throw away those worn-out videos and forget Sky TV — make your own cartoon instead. The Simpsons Cartoon Studio brings all the magic of Springfield directly to your computer. The aim of the package is to create cartoon strips involving the characters from the popular series.

The concept is simple. Pick a background from a range of scenes like the kitchen or the living room, and add some props such as a table or the famous Simpsons sofa. Then choose the characters you would like to star in your cartoon: perhaps Homer or Principal Skinner? Put the special effects and sounds with it and Bob's your uncle! Or maybe not.

Okay, I said the concept was simple, but when you get down to it, it's a bit baffling. I



Above
Mr Burns pays
Lisa a flying visit



Left
The editing
control panel is
confusing

started off by following the instructions in the manual which gives you a step-by-step guide to creating a standard cartoon. That was fine, except my finished product didn't turn out like the manual had promised it would. I eventually gave up on the instructions and began fiddling about with it myself. And, I must say, some of my cartoons were quite good, even if they did last all of five seconds.

You certainly need a knack for this package. If you want to produce a good cartoon, you just have to stick with it and

keep trying, over and over again.

There is little variation in the way you work: there's the drawing board in front of you and you can add and delete as you want. I found myself adding things I didn't want and not knowing how to get rid of them, or deleting things I *did* want and then not being able to get them back. The "Editing Control Panel" was responsible for this, consisting of six pictures of filmstrip in different "poses". One hand pulling it from the left side, one hand pulling it from the right, two hands pulling both sides ... It all

became terribly confusing, as you can imagine.

I loved the sound effects. Being able to make Homer recite lines about waffles and doughnuts all day was fabulous, and Apu's "Thank you come again" was a favourite.

I'd sum up the package as a "stick at it and it will come to you" type of thing. You need patience to explore the possibilities for creating different cartoons.

I would recommend Cartoon Studio to anybody who likes the Simpsons or thinks they can do it that little bit better than the animator, Matt Groening. The package is suitable for kids and adults alike. Bearing in mind it really is hard stuff, I wouldn't recommend it to the under-16s.

Eteika Clark

PCW Details

Price £34.99 (£29.77 ex VAT)

Contact Fox Interactive 01753 549442

System Requirements Windows 95, 3.1, 3.11 and Macintosh

Good Points The feeling that comes with creating your own cartoon.

Bad Points The time it takes to do it.

Conclusion Come on! It is the Simpsons.

★★★

Software

Animals of Farthing Wood

With videos and kids' favourite fauna from Farthing Wood, this adventure is a treat for all.

This new CD features the animated characters from the BBC's TV series. It pits children and their favourite animal characters against natural and man-made disasters in a race for survival.

The object is to help the animals of Farthing Wood reach the safety of White Deer Park and escape the bulldozers and drought which have ruined their homes. Along the way, they must overcome obstacles like roads and rivers and pass through various natural habitats.

To help the animals find their way, children must gather information from natural history video footage, picture clues



and audio hints, and accept help from the animals themselves. When the child misses a clue or follows the wrong track, the program suggests how to retrace their steps. I found that children as young as five managed the easy-level adventure despite

Children can help their favourite characters to overcome obstacles and reach safety

a recommended age range of seven to 11. The motivation for playing the game comes down to using familiar skills. What child could say no to building a log bridge over a river or finding food for a starving animal?

Debbie Davies

PCW Details

Price £29.99 (£25.52 ex VAT)

Contact BBC Multimedia 0181 576 2112

System Requirements Win3.1 or Win95

Good Points A program to satisfy parents as well as children.

Bad Points Best viewed in 16-bit colour.

Conclusion Like AA Milne's *Poochsticks*, make sure this is in your collection.

★★★★★

Kingfisher Learning Explorer

An encyclopedia for kids who want to do their homework — it won't inspire those who don't!

This reference CD is designed for children aged 7 to 12 to use as a homework aid, yet it doesn't set out to excite and encourage them to learn; rather, it assumes prior motivation. But it has been well constructed, with good graphics and whizz-bang type noises.

Children start in Zak's bedroom where they click on their chosen topic, each with a list of categorised subjects.

There are a number of ways to navigate around this CD. While studying a subject, children can pull up a list of related articles or look in the dictionary/thesaurus where each entry has hyperlinks to others, so they may find themselves exploring subjects not



previously studied. Although the musical pieces in this CD sound like they were recorded using the keypad of a touch-tone phone, the title has many nifty features. The most useful is that it can be linked to a word-processing application, so text or pictures can be downloaded into a

Zak's bedroom may be a mess, but the subjects and topics are tidily organised

homework document. Presumably, the publishers of this CD have assumed close supervision of kids by their parents to avoid inadvertent plagiarism, even though the information included is very basic.

Lynley Oram

PCW Details

Price £39.99 (£34.03 ex VAT)

Contact Liris Interactive 0171 306 1100

System Requirements Win3.1 and Win95

Good Points Great for helping kids with their homework.

Bad Points Poor music quality. Could use more video clips.

Conclusion Not a patch on the old-fashioned paper encyclopedias when it comes to detail, but nevertheless quite useful.

★★★

p104 >

Software

Cyberpest

Billed as "the critter in your computer", your pest needs food, water and (excessive) discipline.

This is similar to other CDs which provide a pet on your desktop for you to care for and play with, except that this features a *pest*, designed to annoy you. However, the pest is endearing and didn't annoy me enough for me to want to punish it. It inhabits a room with playthings in it and likes to bury things, so place your ornaments on the top shelf.

Help is at hand for the pest's mental and physical development. Its personality depends on the hour of its birth (i.e. when you first load the CD). Mine was born at 3pm and was moody, anxious, and prone to biting and hiding. But help comes in the form of advisers like a Pest Vet and a Pesterminator. The vet helps with problems ranging from fleas to constipation. The



Therapest advises you what to do about depression, anxiety or introversion (in the pest, not you). If it gets manic, you're advised to give it electric shock treatment. In extreme cases, the Pesterminator tells you to give it too much food so it explodes. Not at all pleasant.

There are many ways to punish your pest, from the sublime to the ridiculous

The sound effects are good and the sense of humour is strong but a bit sick.

This CD is for adults and kids, but children will either quickly tire of it or grow up with a distorted view of right and wrong.

Rachel Spooner

PCW Details

Price £14.99 (£12.75 ex VAT)

Contact Koch 01256 707767

System Requirements Win3.1 or Win95

Good Points An amusing way to spend breaks between work.

Bad Points Sick.

Conclusion Good value if you like this kind of thing.

★★★

Five on a Treasure Island

When it's raining and the children don't want to play outside, this could be a spiffing wheeze.

Most of us are familiar with The Famous Five, a bunch of boys and girls aged between 10 and 12 years old who are allowed to roam the countryside on their own and have adventures, with never a responsible adult in sight. You wonder why on earth their parents haven't been arrested in a blaze of "home alone" tabloid publicity.

The CD is crammed full of jolly things to do and has features that enable it to be used as a teaching aid. Actress Susannah York narrates the book, but children can read it themselves. The text size can be enlarged and you can make notes as you read the story.

It is beautifully illustrated with lots of fifties-style drawings and clips from the TV series, and it's all jolly good fun. To really involve the kids in the story, there are



lashings of games and quizzes. These vary from crosswords to story-writing, and even include a role-playing game. Hurrah!

Some of the activities, like the ones that aim to teach literacy skills, may smack too much of homework to really hold a child's attention. Paradoxically, although it aims to teach subjects like literacy skills, the title is full of author Enid Blyton's grammatical

Yo, ho, ho! and a barrel of fifties-style fun on Treasure Island with Dick, Julian and the rest

howlers, such as thanking kids for "adventuring with us".

This is the first of many CDs planned for release by Systems Integrated Research, a British software company. Two further titles are due for release soon.

Lynley Oram

PCW Details

Price £29.99 (£25.52 ex VAT)

Contact SIR 01773 820011

System Requirements Windows 3.1, 3.11 or 95

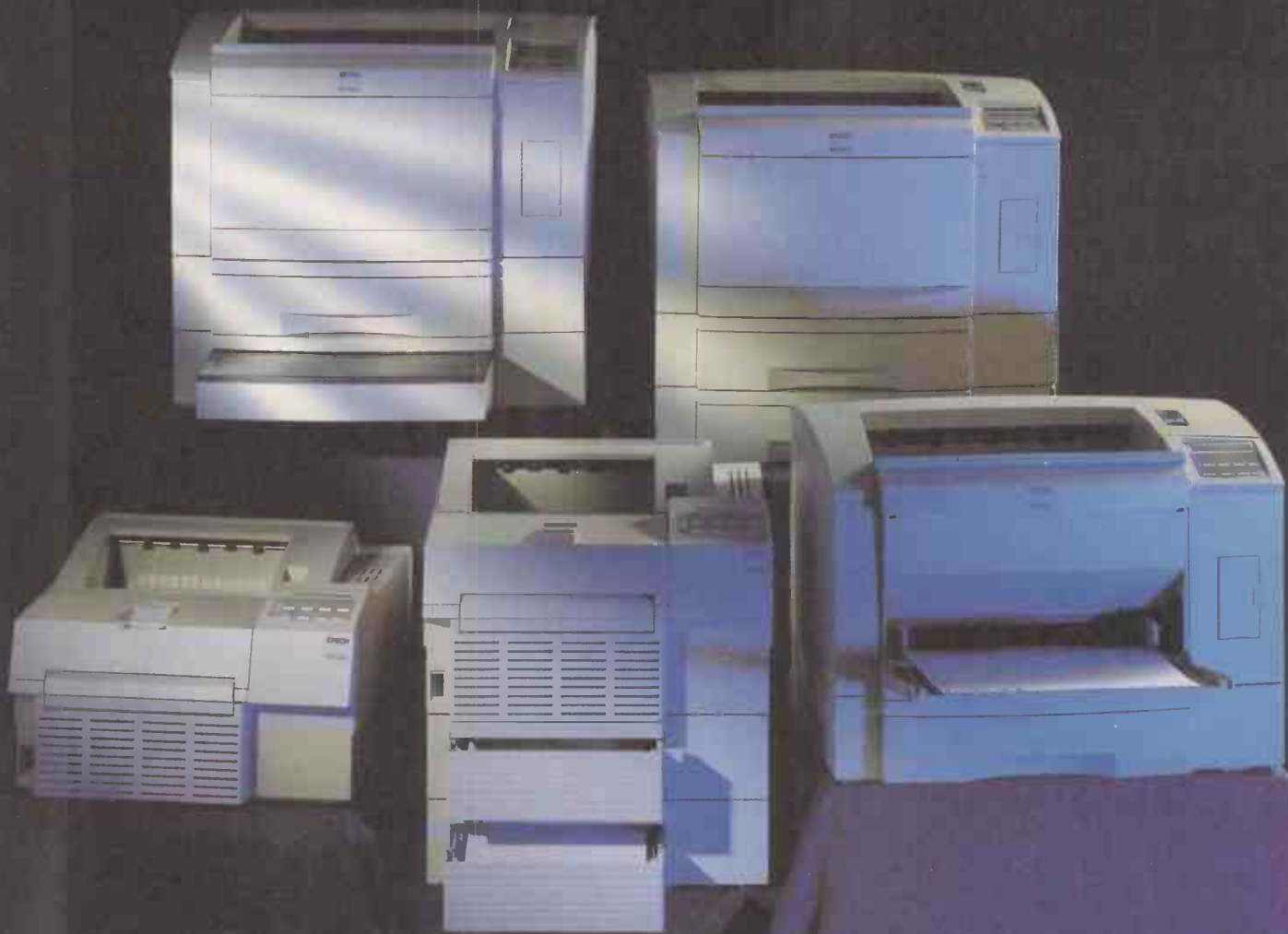
Good Points Lots to do. Good value for money.

Bad Points Some of the activities could be a bit more exciting.

Conclusion Isn't it a tad cruel to set kids up with a PC in their bedroom and then feed them CDs about how much freedom children used to have?

★★★★

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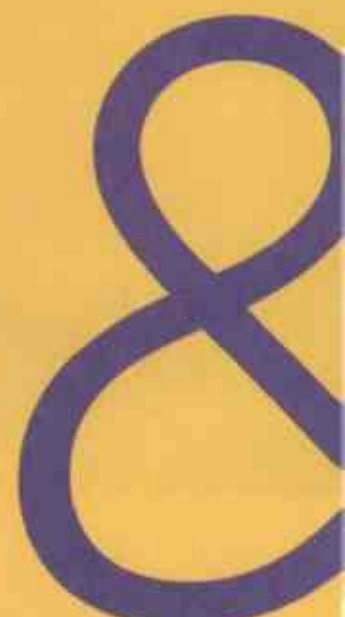
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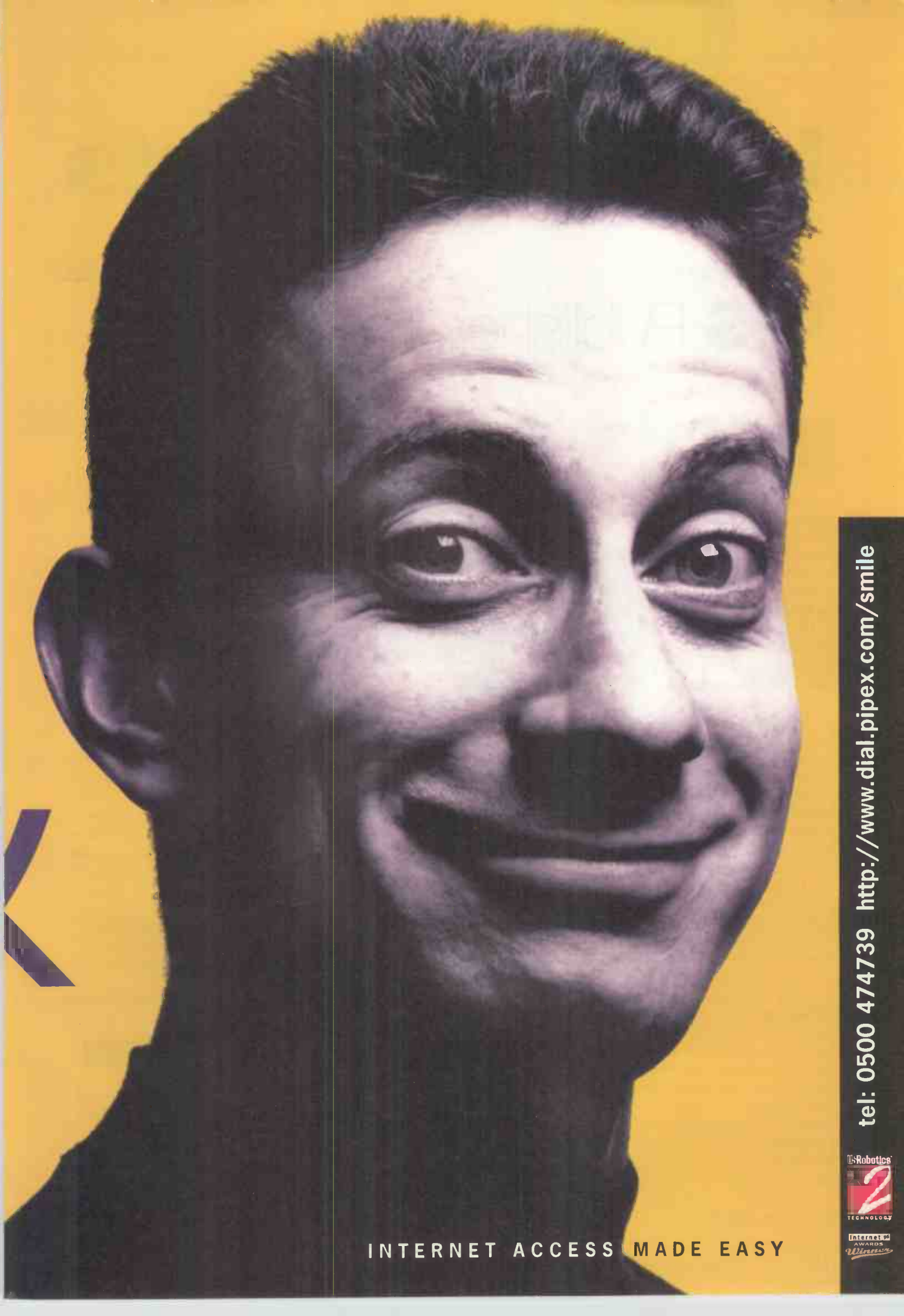
Even the press has caught the mood. Six leading PC publications all agreed that people who use PIPEX Dial have more to smile about, and in a recent survey by PC Pro, we left four major ISPs looking very slow (and a little sad).

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■ Software

PFS Publisher 1.1

Desktop publishing at a bargain price for those short of cash or power on their PCs.

This version of PFS Publisher is for Windows 3.1 or later. I have used it with Windows 3.1 and Windows 95 and it doesn't really change except that it refuses to accept long file names in Win 3.1. Publisher is supplied on three 3.5in floppies and has lots of excellent clip-art, some tutorial samples, and a small but worthy collection of bitstream TrueType fonts.

On launch you get a small but sensible toolbar. It's not reconfigurable but you can edit the "QuickButton palette", the other toolbar in a small window which handles zoom and cut and floats on your desktop. If you click on the "new text frame" button on the toolbar, you can instantly drag out a frame and begin typing into it. Right-click anywhere in the Publisher window and the toolbar will change to another small but sensible toolbar with drop-down menus for all the font options. However, you do have to go into the menus for items like tabs, spacing and drop caps. There's a spell-checker and thesaurus, as well.

Initially, when typing, I found the word processor a little slow to respond but have adjusted to it over the past year. It will import ASCII, RTF, MS Word, WordStar, AmiPro, WordPerfect, and PFS Works text formats. The word processor also offers some interesting features such as an automatic contents and index page maker.

Another useful feature is the New Window check box in the Open and New dialog boxes: when you have finished with one document, you can un-check this option to automatically close it.

When setting up the page layout for publication you discover a nice feature called Facing Pages which allows you to view the left and right pages of a booklet together. It has a good "master page" feature which allows you to program

requires Windows 3.1, DOS 3.1, a 286 processor, mouse, 2Mb RAM, 6.5Mb of hard drive space and EGA graphics. This can only be described as a miracle for non-state-of-the-art machine users.

My major complaint is the Snap To

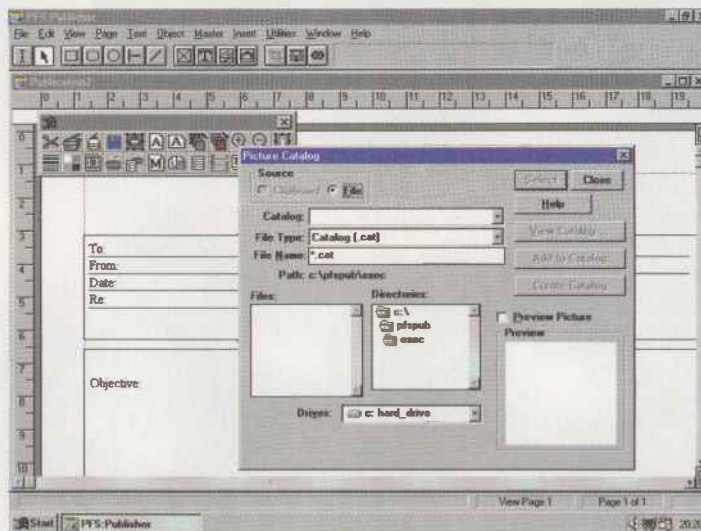
Guides and Snap To Ruler features. When you zoom in to 200 or 400 percent, you find that these features have only *roughly* aligned the frames to the guides or rulers. To get them dead right you have to zoom in to 800 percent, set your mouse to the slowest movement and arrange them manually. What a pain in the neck!

Another annoyance with Publisher is that it insists on having at least one publication open at a time, and when all the publication windows are minimised, the File menu cuts itself down to only two items — Printer

Setup and Exit. Strange.

So would I recommend this package? It's very good value for money: if you are short of cash it's a good choice, but only if you aren't fussy.

Thomas Cumming



PFS Publisher 1.1: a simple interface for a simple, yet effective, DTP package

objects to appear in all pages that you specify. Publisher also has a "Macro Recorder" option in the system.

The package comes with a selection of templates and a cataloguing system for these plus any you make yourself. It has its own cataloguing system for graphics files, but unfortunately not all file formats are supported.

Publisher's documentation is excellent on paper but pathetic on screen. Essentially, all the help file lists are the menu commands, which becomes annoying. However, help is available on the status bar when you float your mouse pointer over programmed "hot spots" such as toolbar buttons.

What surprises me particularly about Publisher is its system requirements. It only

PCW Details

Price £29.99 (£26 ex VAT)

Contact The Learning Company 0181 246 4000
Good Points Cheap. Easy to use. You can run it on your old 286.

Bad Points Poor "snap to" features. Poor on-screen help.

Conclusion It has served me well. A worthy yet affordable package.

★★★

MS Works 4.0 for Win95

MS Nanny for Win95, more like. Some nice features, but shame about all the hand-holding.

Works 4.0 is misnamed. It should have been called "Office for Kids". The previous version (3.0) was almost an "Office Lite", and handled most of the tasks needed in a small business. This version is similarly functional but assumes that if you don't need the machismo of "Office Pro", you must either be a novice, or thick.

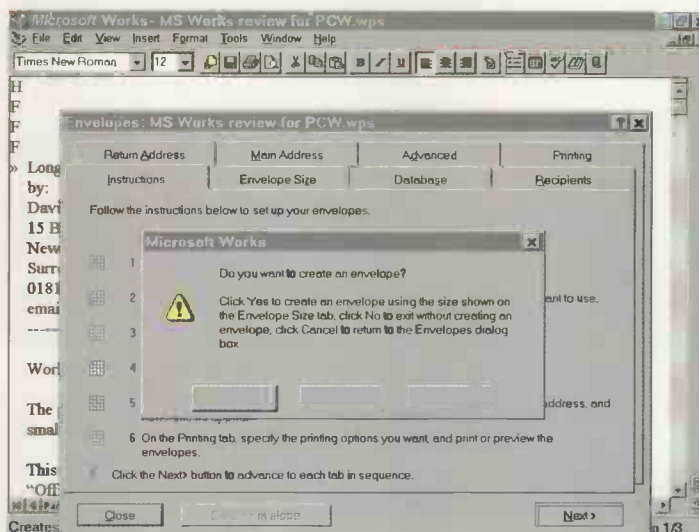
Your hand is held constantly, to the point where it becomes obstructive. The Envelopes function is a prime example. Normally, you write a letter, highlight the address and select "envelope", expecting the envelope size, return address and font to be the default. Not so with Works 4.0. Instead, up pops a dialog with eight tabs and instructions on how to create an envelope. Even after I clicked "envelope" and closed the ensuing dialog box, Works 4.0 still asked if I wanted to create the envelope! Remember when you were 16 years old and your mum still tried to hold your hand crossing the road? Well, that's how I felt when this happened. You can turn off the cue cards and you don't have to use the wizards, but you can't hide the "program for idiots" ethos.

At its core, Works 4.0 is an effective piece of programming. My installation took up just over 20Mb on my hard drive, including the dictionary, thesaurus, and clip-art files, but with care you could prune this to about 15Mb.

The database is merely a sophisticated cardfile and the weakest item in the suite. Form design is straightforward with drag-and-drop labels and fields, but they're flat files and fairly lightweight. I set up a simple database of 1,000 names, addresses and numbers with some date and yes/no fields, and discovered some limitations. The number of queries which can be stored is limited and is made worse by the lack of a macro facility.

Sadly, the database emphasises design and presentation above the more important functionality. It is frustrating to see the duplication of information in a non-relational database.

The spreadsheet is better but it lacks



Arghh! Works 4.0 really makes you work hard to print a simple envelope

some of the functions of Office 95; most people I know mainly use the simple maths utilities. It's intuitive to operate, with named ranges, auto-sum and auto-format. I like the way I can set up a sheet to track my share-holdings in five minutes flat, but this may say more about my shareholdings than the spreadsheet. It's so easy to use that I will happily knock up a quick-and-dirty one-off sheet to compare different Tassas with all their variations. For charts, just highlight a range and click.

The comms section is crude but usable and includes Zmodem and scripts.

The star of Works is its word processing utility. You can drag-and-drop sections of database and spreadsheets, insert pictures, drawings, notes and objects, and use WordArt to jazz things up. You can even write with it! The wizards are excellent, requiring little effort or thought to set up letterheads. The important word processing functions like print preview can be placed on the toolbar for quick access.

A new feature is Easy Text. For example, "Yours **faithfully**", three blank lines and your name can be "easy texted" to typing "yf" and hitting F3. But as I like my name bold and underlined, the Easy Text must be similarly formatted so it would need two sequences of Easy Text. It's quicker to type and format it manually. There is a raft of pre-formatted Easy Text,

none of which I want as the function is too inflexible for my needs.

Works 4.0 could easily be improved if Microsoft removed the hand-holding and added macros. I would then regard it as a reasonably-priced word processor with useful spreadsheet and database functions.

David Thorpe

How you can contribute to our Long Term Tests section

We welcome readers' contributions to our Long Term Tests section and pay for any we publish. If you've used a piece of hardware or software for some time, write a 300-word article for hardware, or a 650-word piece for software (with a Gif format screenshot), and send it on disk in MS Word (Mac or PC) or ASCII format to Dylan Armbrust at the usual PCW address, marking your envelope "Long Term Test", or email it to dylana@vnu.co.uk.

PCW Details

Price £66 (£56 ex VAT)

Contact Microsoft 0345 002000

Good Points Decent spreadsheet and word processing facilities.

Bad Points Too much hand-holding for my liking.

Conclusion A solid, basic, all-in-one suite that does the job.

★★★

3 YEAR TEST

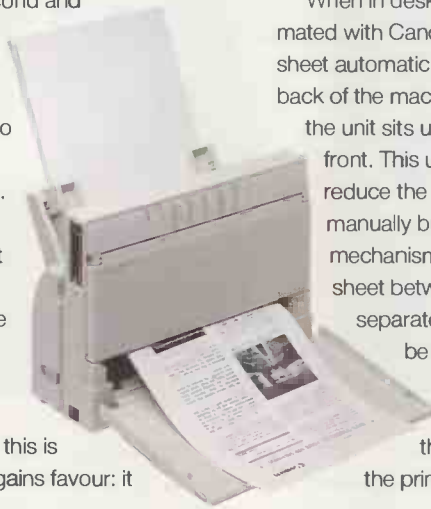
■ Hardware

Canon BJ-10sx

Have printer, will travel. This bubblejet may chug along slowly but it is portable and reliable.

By today's standards, the Canon BJ-10sx Bubblejet seems slow and lacking in print quality. In 360dpi mode it can only manage 110 characters per second and it's not that quiet when it's running full bore. But to be fair, three years ago its attributes were not below average.

It weighs just under 2kg (without batteries) and occupies much the same footprint as an issue of *PCW* on the desk. It is quite portable and this is where the Canon gains favour: it



seems to be a printer destined to accompany a notebook PC on its travels. The BJ-10sx could be defined as a neat product for a niche market.

When in desk mode, the printer can be mated with Canon's ASF 64200, a 50-sheet automatic feeder which clips onto the back of the machine. However, this means the unit sits upside-down and back-to-front. This ungainly affair is intended to reduce the drudgery of loading paper manually but in practice the complex mechanism required to pass each sheet between the two, fundamentally separate, pieces of equipment can be a bit temperamental.

Occasionally they jam, or at other times two or three pages get fed through the printer instead of one.

After nearly three years of flitting between desks 100 miles apart, I have found that the Canon BJ-10sx was an economical and reliable choice. Its pairing with the ASF 64200 may be eccentric, but ultimately the combination makes a successful compromise between portability, quality and speed.

Martin Cooper

PCW Details

Price (Discontinued item)
Contact Canon 0121 680 8062
Good Points Easily portable and cheap to run.
Bad Points Optional sheet feeder is rather temperamental.
Conclusion Reliable and a pleasure to use.
 ★★★

■ Hardware

6 MONTH TEST

PC Science Multimedia Pro P133

A solid PC for home or SoHo use which looks good, sounds great and won't break the bank.

We tested the Multimedia Pro for our PC group test in *PCW* August '96. In our lab tests, the machine turned in an average performance for a Pentium 133MHz, with 16Mb RAM and 1.7Gb hard drive. It then underwent a long-term test and was subjected to a six-month pounding. It survived, and has proved to be solid and sturdy.

The PC came with 31 CD-ROMs, a QuickShot joystick, a microphone and speakers. First-time users would appreciate the variety of software.



All multimedia aspects were high quality. With an IBM Sound Miracle 28.8 ISA card, based on an Mwave chipset and enhanced by the Trust speakers, the sound was a delight. CD audio quality from the Aztec eight-speed drive was good and often replaced the hi-fi during long work periods. Modem and internet activities were

supported by the Miracle 28.8 card whose functionality and reliability remained stable over the test period.

Solid graphics performance came from a Matrox Millennium card and a 17in Daytek monitor; a pairing which would not have disappointed any gamer or SoHo user.

It is difficult to fault the PC Science. All the components were of a high standard and it maintained respectable performance. The only weak point was the memory: the four slots were all utilised and any upgrade plans would entail a complete SIMM replacement. It coped with nearly every new software package, two operating systems and my favourite legacy DOS shareware.

Jonathan Ricks

PCW Details

Price Then: £1,762 (£1,499 ex VAT).
 Now (approx): £1,400 (£1,200 ex VAT)
Contact PC Science 01423 323386
Good Points Great graphics. Complete home multimedia bundle. Upgradeable.
Bad Points Full memory banks.
Conclusion Quality components in a solid PC. For the money, you can't really go wrong.
 ★★★★★

KILLER SERVER



The new Apricot FT1200 server, from Mitsubishi Electric.
Specified and priced to kill off desktop servers
and most mid-range servers, too.



In a typically ground-breaking move, Mitsubishi Electric PC Division have changed the face of server computing by delivering mid-range server features for less than the price of a desktop PC - let alone other so-called desktop servers.

It's one more example of how Mitsubishi Electric's \$35 billion worldwide revenues (with \$1.77 billion spent on research) are producing innovative, cost-effective solutions for an ever-wider range of business customers.

KILLER DESIGN

Because it was designed and engineered from the ground up as a server, the Apricot FT1200 boasts a rugged construction underneath the hi-tech exterior styling.

Features like its heavy steel case and lockable front door and side panels are all designed to keep the wrong hands off your data.

(With the power switch situated behind the front panel, that includes *careless* hands, too).

High levels of data integrity are assured through sophisticated DMI & SNMP compliant server management that keeps control of all critical areas of the system.

KILLER PERFORMANCE

To get the best out of today's 32-bit client/server software, nothing less than the best available 32-bit processor will do. Which is why the new Apricot FT1200 server comes with the Intel 200Mhz Pentium®Pro processor as *standard*.

And since raw performance is academic without data-handling to match, the Apricot FT1200 has integrated Ultra-Wide SCSI - with a transfer rate of 40Mb/sec - also as standard.

KILLER DATA INTEGRITY

Data is a priceless commodity for most businesses today and the Apricot FT1200 has everything it takes to protect your investment.

With bays for up to four fixed disk drives, giving a potential for up to 16Gb of storage, combined with its PCI-based RAID controller option, the Apricot FT1200 can spread data across a number of hard drives but still make them appear as one logical disk. In the unlikely event of a disk failure, the system continues to operate as your data is still available.

For maximum integrity, the system can even be configured with a disk as a "hot spare" which will automatically take over from a failed disk.

An optional Smart UPS further protects your data against brown-outs or even total power failure.

KILLER PRICE

Spec for spec, nothing comes remotely within reach of the new Apricot FT1200.

Look at the table opposite and compare it with the best Compaq, IBM, Dell or HP can do.

Then you'll see just what a killer the Apricot FT1200 really is.

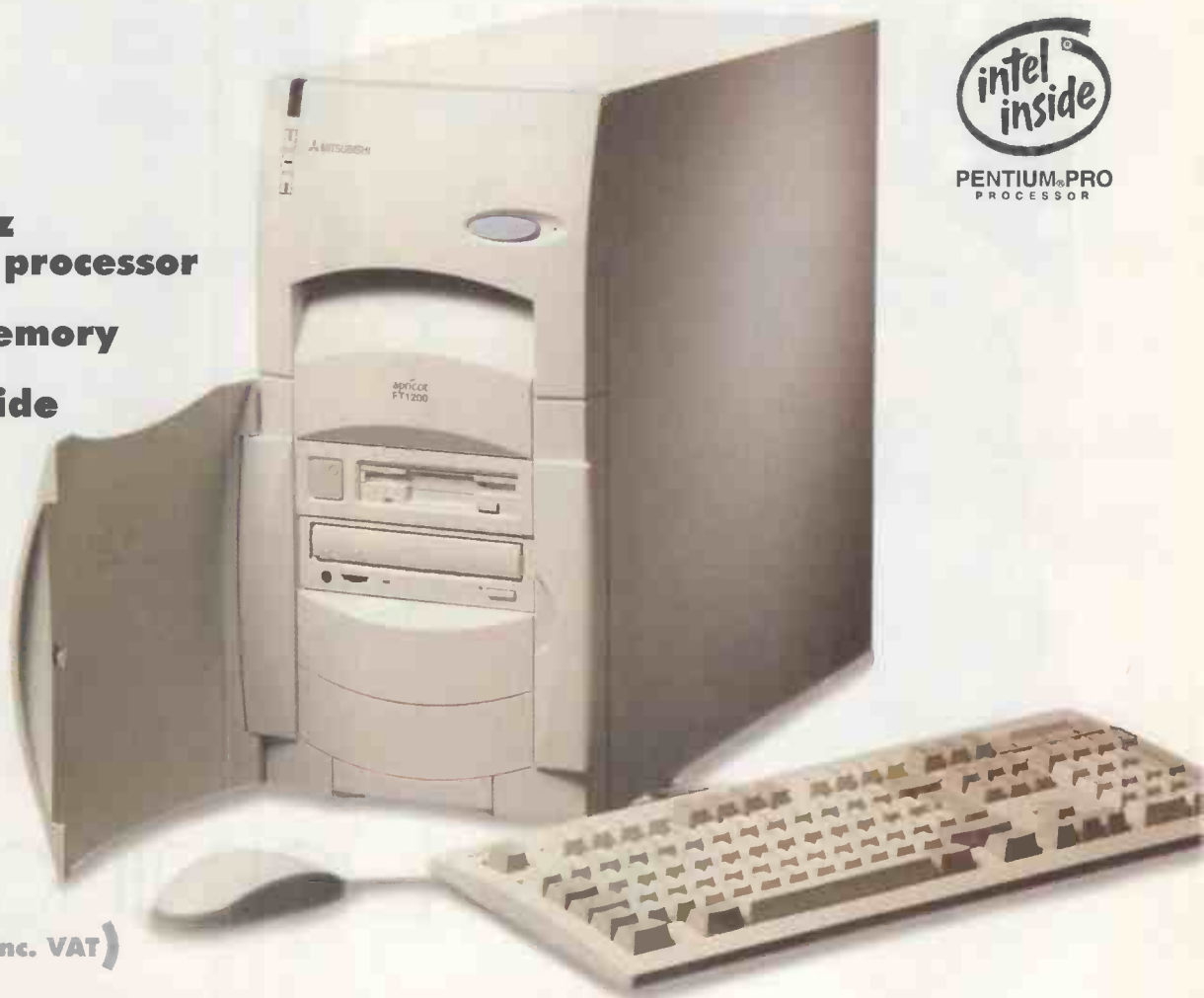
STANDARD SPECIFICATION	MITSUBISHI Apricot FT1200	COMPAQ ProLiant 800	DELL PowerEdge 2100	HP Netserver LD Pro	IBM PC Server 325
INTEGRATED ULTRAWIDE SCSI	Yes	Yes	Yes	Yes	Yes
MANUFACTURER'S SUPPLIED DISKS	UltraSCSI	UltraSCSI	Currently SCSI-2	Currently SCSI-2	UltraSCSI
PCI BUS	Yes	Yes	Yes	Yes	Yes
ECC MEMORY	Yes	Yes	Yes	Yes	Yes
UNIVERSAL SERIAL BUS	Yes	No	No	No	No
INTERNAL DEDICATED 3.5" FIXED DISK DRIVE BAYS	4	1	3	3	4
MANUFACTURER'S RAID OPTION	Yes	Yes	Currently No	Yes	Yes
INTEGRATED SYSTEM MANAGEMENT	Yes	Yes	Yes	Yes	Yes
LOCKABLE FIXED DISK & EXCHANGEABLE AREAS	Yes	No	No	No	Yes
LIST PRICE ⁽¹⁾	£1,999	£2,710 ⁽²⁾	£2,799 ⁽²⁾ (including 15" monitor)	£4,158 ⁽²⁾	£4,736 ⁽²⁾

NOTES: (1) Manufacturers' published undiscounted list price, ex VAT, for a system comprising 200MHz Pentium Pro chip / 256Kb cache / 32Mb memory / 2Gb disk / ethernet. Discounts may be available. (2) 180MHz models available at lower list price. (3) Prices and specifications are taken from manufacturers' published UK January price lists and other published information, and are correct at time of going to press. Prices and specifications are liable to change. Manufacturers may make special promotions from time to time. All trademarks acknowledged.

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PAUL SHORROCK

Lotus Domino 4.5

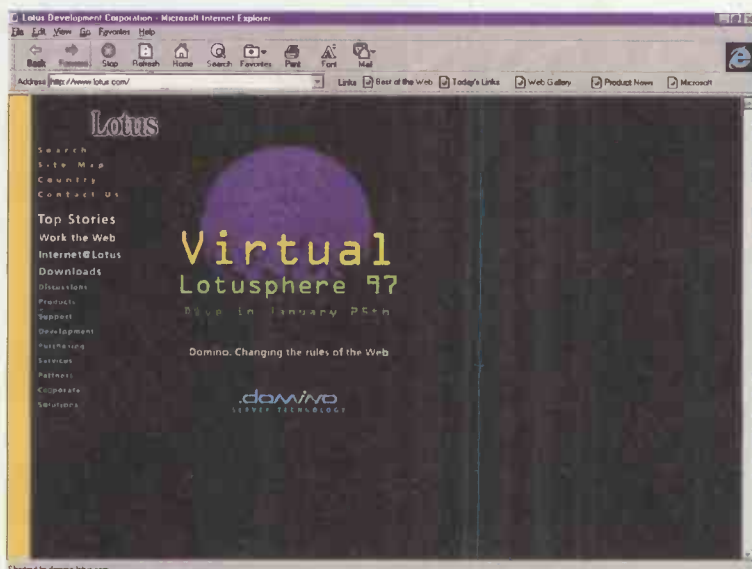
Domino is not so much an upgrade; more a case of marrying Notes to the net. Eleanor Turton-Hill reviews Lotus's bid to knock spots off the groupware market.

Lotus Domino is more than just an upgrade to existing Notes software. It is a response to the fast-moving software market in which "groupware" has undergone a process of radical change. In the past couple of years, the internet has provided businesses with a new, simpler, groupware model: one which allows users to embrace almost any type of information using a single piece of common software, the web browser. Hence the groupware market has shifted drastically, and consequently, Notes has been forced to reposition. With the release of Domino Server 4.5, Lotus hopes to re-establish its hold on the groupware market

by uniting the two worlds of Notes and the internet.

Until recently, the one disadvantage of using Notes as a groupware platform was that it required the support of a client on the desktop. The architecture proved expensive, not only because of software costs, but also because of the expertise required for its configuration and support. Many people perceived Notes as complex, expensive, and intimidating.

To alleviate some of these concerns, and to re-position itself as the leading groupware vendor, Lotus has made some bold changes. In this release, the Domino 1.0 web server add-in has been integrated with the Notes 4.x



The Lotus Domino web site is a showcase for the product itself, set up to demonstrate the powerful mix of the internet and Notes

server, making one all-encompassing platform called Domino Server 4.5 powered by Lotus Notes. Effectively, Lotus has combined the strengths of the internet with the superior security, application development and information management features built into Notes.

The Domino server translates Domino and other existing Notes databases into web format on the fly. This contrasts with Lotus's previous web solution, InterNotes, which could convert Notes databases into HTML files and make them available to clients via a separate web server. With InterNotes, the conversion process occurred at regularly scheduled intervals so that when a document was changed, or added to, on the Notes database the web document would reflect this change after the next scheduled publishing refresh. In order for this process to function at all, there had to be an InterNotes-enabled Notes server running and connected to the internet.

Domino is a kind of hybrid Notes server. It extends the capabilities of the older InterNotes technology beyond the one-way publishing solution. InterNotes was fine for pushing information out to a web server but useless as a platform for building and deploying applications. Domino does more than just publish documents and fill out forms. It allows users to make use of Notes applications over the net (or intranet) with little or no change to their design.

Security

One of the great advantages of Domino is that it provides web access to the many Notes security features. Access to any database can be configured with security restrictions right down to the field level so that any of the existing company workflow applications developed in Notes, which previously required a Notes client, can now be used over the web using an ordinary browser.

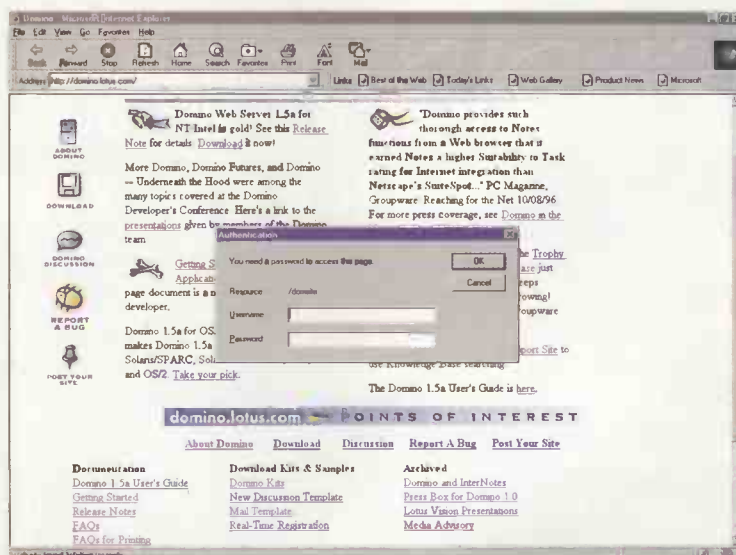
Before employing Domino, users must be assigned an HTTP password which is stored in Domino's Name and Address Book (NAB), the central repository for all user-login information. The various security features of access

control, authentication and encryption are then implemented, but in a different way to the traditional client/server model. Domino opens up access to a whole world of net-connected browsers and this throws up a load of security implications that did not exist in the old model.

Seasoned Notes administrators will know that in previous versions it was possible to set up anonymous access to a given database. This allowed users to read and write data with no registered authentication, or record, of their access. If you want to protect a database from this kind of public access, the Anonymous parameter in the Access Control List (ACL) can be set to "No Access".

The point is that this step has to be performed explicitly. If the Anonymous

parameter is not set, then users are granted all the privileges defined in a database's Default Access. This kind of security issue is not so crucial under the traditional client/server model where access to databases can be carefully configured, but with Domino's web access



architecture, data becomes far more vulnerable.

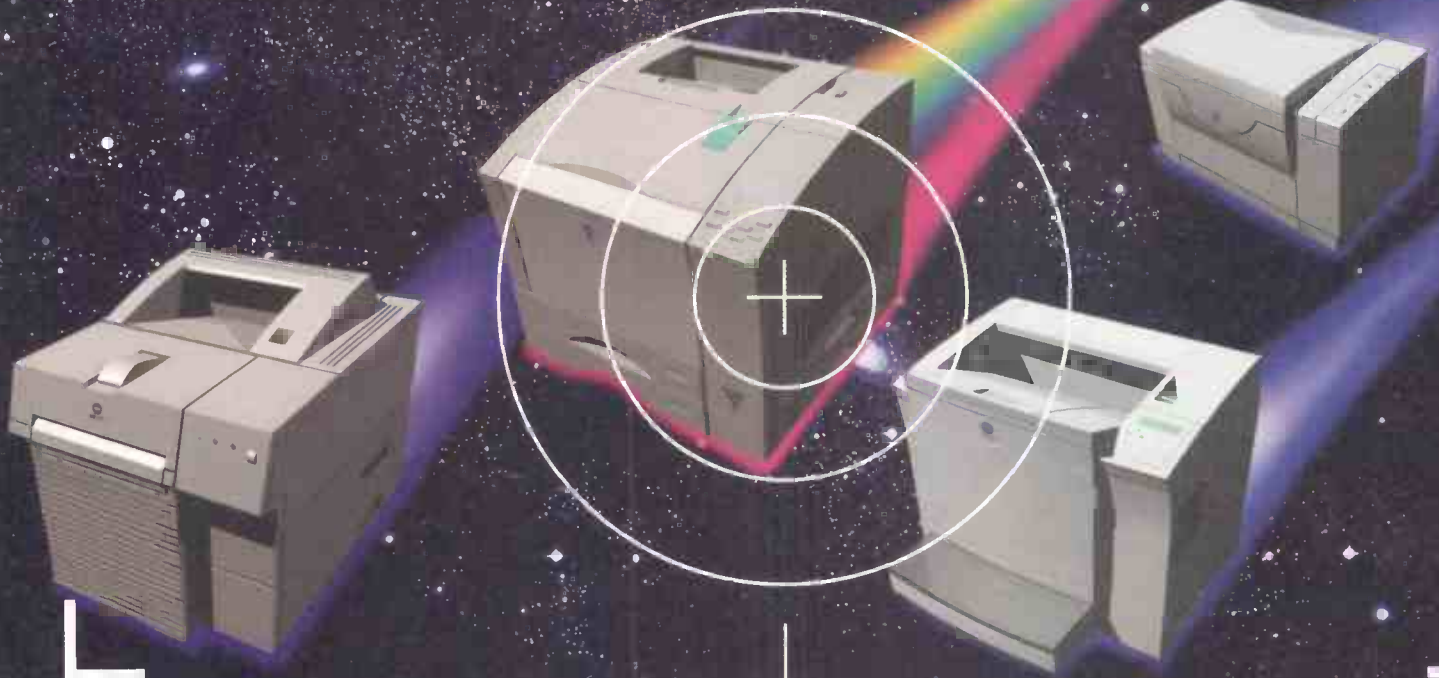
In Domino, security can be defined on two levels. ACL files can be defined for individual databases to limit access to specific users or groups. Your existing ACLs should be thoroughly checked before you install Domino as you may want to change your security policy. Then, when Domino has been installed, the NAB is updated with an HTTP password for each user so that requests to access specific databases can be validated against a given user's name and password. This provides exactly the kind of security with which users are familiar, over the web: simple usernames and passwords sent down the wire in response to access requests.

The security features built into Notes are also demonstrated on the Domino web site. Certain areas of the site are protected with user names and passwords



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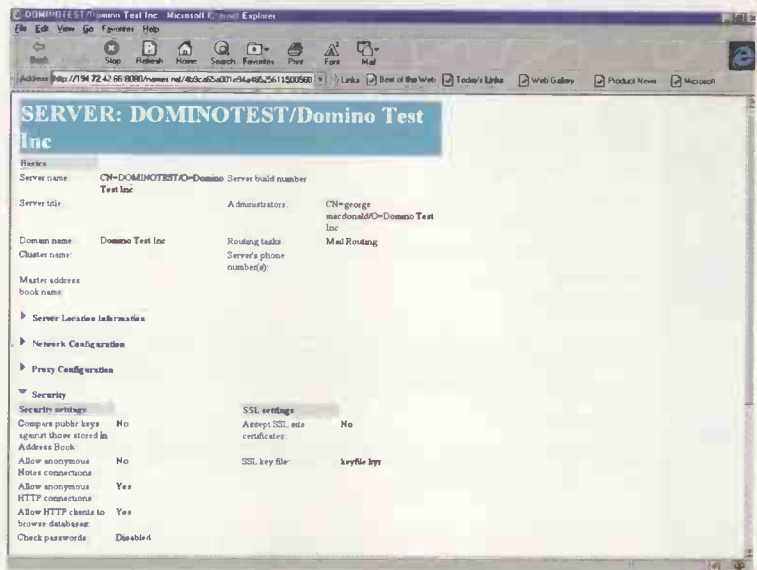
Higher-level security can be defined using SSL encryption. This ensures a higher level of protection for all transactions between the client and the server. SSL is now an industry standard supported both by Netscape Navigator and Microsoft Explorer. It provides a high level of confidence that network traffic is not being tampered with and that the appropriate messages are being sent back from the server side.

Client software

The security features built into Domino for web access seem impressive — so much so that it is difficult to justify the existence of the Notes client software. So, how exactly does the client software now fit into Notes' new architecture? The features and capabilities, which have been passed on to the web browser, are now so comprehensive that the traditional client software seems virtually redundant. So why would anyone spend the time and money on a traditional client/server setup?

The first, and probably overriding justification for implementing the traditional architecture (especially for large corporations) is security. With traditional client software, there is still a far finer control over access privileges, controlling security right down to field-level encryption. Second, certain workgroup applications like calendars, scheduling, and accessing mail offer much higher functionality under the client software.

There are many other capabilities that exist in the fully-fledged client software which are beyond the scope of a simple web client; like replication, for instance. If you are a laptop user, often away from the network and disconnected, you will need the Object store and



To protect your Notes database from users who are not in the Public Address Book, "No Access" is assigned to the "Anonymous" parameter and this causes Domino to challenge all users who attempt to access the database for their name and password. Here, the security settings to the VNU Labs Notes server are viewed from Microsoft's Internet Explorer

replication functions provided in the client software. With HTTP retrieval now added to the client, you will no longer be required to go through the Notes server for your internet access. You will be able to use Notes' agent technology locally with processes configured to periodically collect information from certain web sites.

Notes' replication facility is one of its strongest features, placing it in a unique position when compared with another type of groupware.

Notes lets you make a copy of your data on a laptop and then, even if you are not connected to a network, you can work on it and update it. When you return to the network and reconnect, Notes will synchronise your changes with the shared copy of the data, resolving any conflicts as it combines the two versions.

There are several other significant web-related improvements to this version of the client software. For example, users will now be able to launch Netscape or Explorer browsers by clicking on a URL in any Notes document. POP3 mail support is also integrated into this version so that mailboxes hosted in Notes can be accessed by any internet POP3 mail client like Eudora, the Windows 95 Inbox, or Lotus ccMail 7.0.

Tools for developers

Notes is now compatible with most major operating systems including OS/2 Warp, Macintosh, various UNIX

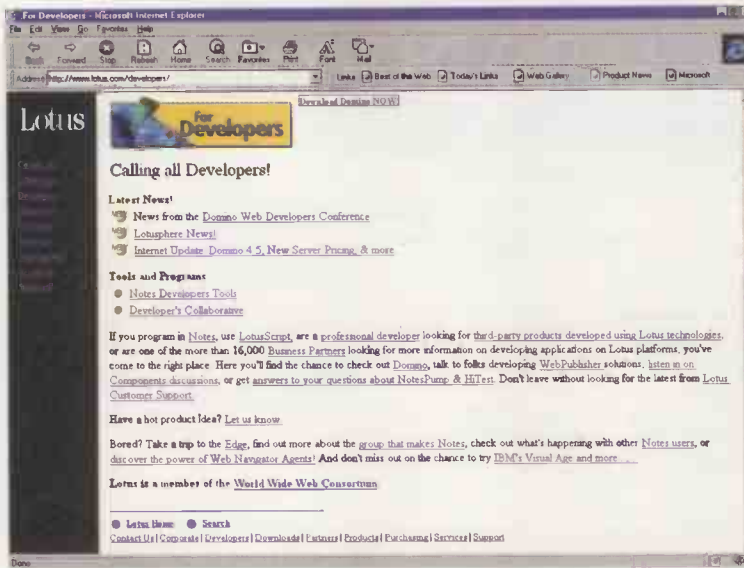
p118 >

How does Domino work?

Domino works by translating constructs, which are specific to the Notes architecture, into HTML. This translation, which is done in real time, enables Notes databases to be displayed in a web client. So all the elements which make up a Notes application (i.e. text databases, formulas, views and links) become web constructs and ultimately they become dynamic interactive web sites.

As a developer, you need have no knowledge of this translation process because it is completely transparent. All the building blocks, which you use in Notes to create applications such as links or Action buttons, are translated into URLs in the web client. When Domino translates Notes constructs into HTML, it also creates URLs where needed. So as the application designer, you need have no knowledge of the web page creation process.

For example, setting up links with Domino is achieved simply by creating Link Hotspots as you normally would in Notes. URLs are created in the web documents on the fly, and the HTML links created in Domino are much more stable than typical web page links. Because ordinary HTML links are file-based, when a file is renamed or moved, the link is broken. Notes links work differently because they depend on uniquely identifying the object of the link. A document could be reclassified, or moved, and the link will still be maintained. This is a typical example of how Domino combines the best functions of Notes and the internet.



Comprehensive support for developers is provided on the Domino web site, keeping you up to date with the latest news as well as providing discussion forums and general development advice

platforms (including IBM's AIX, Sun Solaris and HP-UX) and Microsoft Windows and Windows NT. A whole range of development tools are provided with Notes for building applications.

The language with which most people will be familiar is LotusScript, an embedded BASIC scripting language which is common to other Lotus applications such as Approach 96, Freelance 96 and Word Pro 96. LotusScript is a simple language which has developed more powerful functions over the past few years. It provides high-level functions for controlling and manipulating objects within Lotus applications.

One of the most significant improvements in Notes 4.5 is its ability to execute Java applets; an important capability for developers and for the computer industry at large. Java is, after all, a fast-growing language with important characteristics like platform independence, security, and the ability to divide processing between clients and servers; attributes which have been important in Notes' development right from the start.

The incorporation of Java applets into Notes applications has a two-fold effect. First, it enhances the dynamic nature of Domino pages and extends functionality on the client side. Second, at the server end Java can be used to implement server-based agents that talk directly to Domino's back-end services. Java classes and applets reside on the server and references are made to them from Domino documents.

Also available to the developer is the Lotus Components suite of

business applets designed specifically for Notes. These components are, technically speaking, enhanced ActiveX controls which can be used by developers as building blocks when developing business applications. There are seven applets in all, including a spreadsheet, a charting program, a file viewer and a template builder.

A C++ API is also built into Notes which provides developers with an object-orientated interface and a set of C++ classes which allow application programs to create, manage and access Notes databases. This provides developers with a consistent object model similar to that of the Notes user interface, providing access to Notes-specific functions.

The future for Notes

Lotus Domino is an impressive piece of work and despite any threat posed to the product by the explosive growth of the internet, the fact remains that Notes is a superior tool for implementing complex groupware systems. Unlike the internet, Notes was developed right from the start to be a dedicated groupware tool with a secure shared database structure, integrated email, and a rich development environment which can be used to build your own custom applications.

The web, despite its provision of easy and open access to information, still has a lot of catching up to do before it can provide the kind of facilities which Notes users have taken for granted in the past. The decision point for most businesses will centre on the level of

The intranet

The explosion of the internet had a big effect on Lotus Notes, although not everyone was quick enough to predict it at the beginning. But gradually, as the internet began to be used in business, internet programs migrated onto internal networks, i.e. LANs and WANs using TCP/IP as a network protocol. The invisible network protocols that make the internet work are TCP (Transmission Control Protocol) and IP (Internet Protocol). Although traditionally the preferred internet OS was UNIX, TCP/IP is totally platform-independent and can run any internal network alongside other network protocols. Consequently, the same programs you use on the net can be used on an internal network.

The growth of the internet led to the growth of the "intranet" and hence a whole new flurry of activity in the area of groupware. Users, as well as management in businesses of all sizes, were eager to improve their communication and workflow using the simple browser interface as their client. People found (and still are finding) that this simple architecture provided them with most of the functions they needed to do their jobs: they could instantly get hold of the information they needed and could interact with fellow employees.

One of the most important factors in the development of the intranet was the hardware independence of the browser. In any organisation, a system that is hardware independent provides an ideal infrastructure for connecting all machines together, rather than just isolated groups.

An important point to remember is that a TCP/IP network works the same whether the data resides on an intranet or the internet. If you are running TCP/IP you can access both without making any adjustments to your software.



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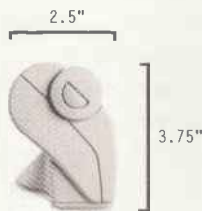
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Lotus Components

Lotus Components include six core applets: Chart, Comment, Draw/Diagram, File Viewer, Project Scheduler and Spreadsheet, plus the Lotus Component Template Builder to customise the Lotus Components into business objects. These applets are designed to work within the Notes environment and are geared to two distinct groups: users and developers.

For the end-user, these fast applets are intended as tools to speed up common daily tasks which might otherwise involve loading a separate application outside of the Notes environment. With a spreadsheet, word processor, and other general office tools available within Notes, documents can easily be created and attached to Notes documents.

For developers, the Lotus components are provided as programmable ActiveX controls designed to extend the functionality of Notes applications. Each one can be customised to the specific needs of an application and because of the high degree of integration between

them, data can easily be passed. As well as providing their own applets, Lotus is also supporting Java and hence the JavaBeans standard which defines a set of component APIs which enable developers to create more powerful cross-platform web applications.

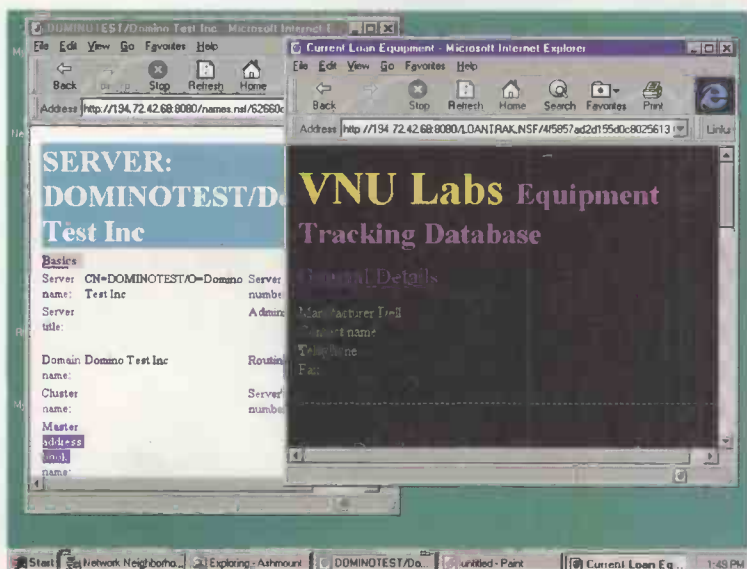
You may well be wondering where this leaves Lotus SmartSuite? The way Lotus sees it, the component applets are cut-down productivity tools. They provide very basic functions which are geared towards their integration with Notes. Each SmartSuite application, by contrast, offers full functionality. The distinction between the two types of application seems clear, yet in practice their roles in day-to-day work are bound to overlap and it remains to be seen how this will affect the suite market.

There is, of course, a large degree of integration between the new components and SmartSuite. The charting tool in the component suite has been derived directly from Freelance Graphics, and Word Pro is now a container for Lotus Components.

complexity they want in their workgroup systems.

Many intranets are built on the assumption that all you need for a groupware system is a web server, web clients connected via TCP/IP and maybe some CGI programs and security. But over time, the system begins to develop and other tools are required for HTML editing, and for managing links as they become increasingly complex. Then, as the information on the site builds up, the number of users starts to increase and you soon need to implement a proper security system. As time passes and users become more familiar with the system, they start to

Lotus Domino enables current Notes users to extend the reach of their Notes applications to any web client. Here we've linked some of our existing Notes 4.0 databases with Microsoft's Internet Explorer on the client



search the server for specific pieces of data. In other words, demand increases for functions which require application and form design tools, and eventually more complex workflow tools.

It's easy to see how a humble intranet system ends up requiring a similar level of sophistication to that which Lotus has been cultivating in Notes groupware for many years. It is accepted by most industry critics that currently-shipping web technologies aren't as powerful as Notes, but technical complexity does not guarantee success. Notes is faced with a significant challenge if it is to regain its former dominance in the groupware market.

In a way, the future of Notes is outside Lotus or IBM's control. Its success or failure depends on the dynamics of a complex software industry in which trends grow and develop and fads come and go at a furious pace. For most businesses, the crucial step is in their analysis of what kind of groupware they are going to need and how they think their system will grow in the future.

There is no reason, of course, why Notes and the web should be mutually exclusive. The two technologies challenge each other and ultimately the development that takes place will be to the business customer's benefit. The popularity of the web has certainly hastened the pace of Domino's technical development, but this has also had a reverse effect: more complex workflow, email and database application design tools are beginning to appear in rival web technologies. In the end, the overall effect of this technological change will be good for the market: you get more features more quickly, so once again the pace of change drives prices downwards.

■ Domino 4.5 costs £400 (£341 ex VAT) for a single processor version; £1,861 (£1,584 ex VAT) for a multiprocessor version. Contact Lotus 01784 445808.

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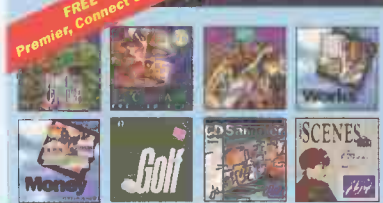
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Multimedia



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 - Latest Plug & Play Soundblaster 16
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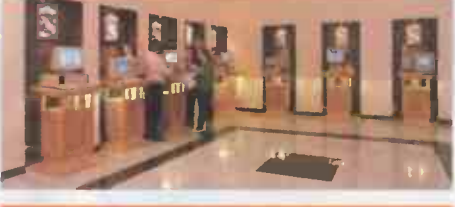
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Technology Update

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P166 Elite Plus



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Computer Shopper 'Best Budget Buy' - June 96

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- 12 Speed CD ROM
- AWE32 Plug & Play Wavetable

- MESH Elite Intel 430HX PCiset system board with Intel Pentium processor
 - Desktop case
 - Dual Channel Fast Enhanced IDE controller
 - 2 fast serial, 1 parallel & 1 game ports
 - 1.44 Mb 3.5" Floppy Drive
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 - Genuine Microsoft Ergonomic Mouse & pad
 - Microsoft Windows 95
 - Lotus SmartSuite 96
 - Altec Lansing CS5 stereo amplified speakers
- All software is pre-installed and supplied on original media with on-line documentation

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P166 MMX HOME	£1467.58	INC. VAT
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P166 Elite ProMedia



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Computer Shopper - December 96

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- AWE32 Plug & Play Wavetable

- MESH Elite Intel 430HX PCiset system board with Intel Pentium processor
 - Mini tower case
 - Dual Channel Fast Enhanced IDE controller
 - 2 fast serial, 1 parallel & 1 game ports
 - 1.44 Mb 3.5" Floppy Drive
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Technology



P200 Elite Fireblade II

Computer Buyer's Best Buy

MMX

P200 Elite Fireblade Plus

COMPUTER SHOPPER "Excellent Buy" Sept 96

PC PRO Value Award

MMX



"MESH is making marvellous machines these days. It impressed us greatly. MESH offers great performance at an excellent price. Go out and buy one at once!"
Computer Buyer 'Best Buy' - November 96



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- 512Kb Pipeline Burst cache
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- 15" FST Digital SVGA Colour Monitor
- 12 Speed CD ROM
- AWE32 Plug & Play Wavetable

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PC Lan "BEST BUY" - July 1996

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Work in progress



Famous for printers and cameras, Canon actually has its finger in lots of pies. When George Cole travelled to HQ, he found diverse plans for the next century.

Hive of industry:
Canon's
Research Centre
in Kanagawa,
Japan

Ask most people what the Japanese company Canon makes and they'll probably say cameras, copiers or bubblejet printers. But there is a lot more to this company than meets the eye. In fact, cameras only account for around eight percent of the company's sales. Copiers and computer peripherals took about two thirds of Canon's £14 billion sales in 1995. The company is also heavily involved in optical products, solar energy, biotechnology and projects that could change the face of personal computing. These include high-density memories, flat-screen displays and high-speed optical networks.

The secret behind the success of many Japanese electronics companies is simple: they invest a lot of money in research and development, keep one eye firmly

on the future, and will radically change direction to stay ahead of the game. Canon invests over ten percent of its budget on R&D and, in 1995, filed 1,087 new patents in the US, second only to IBM with 1,383. Canon's president, Fujio Mitarai, says the company is now preparing for a new age: "The backbone industry of the 21st century will be the information industry," he says.

Hiroshi Tanaka, Canon's vice-chairman, takes up the theme: "We're entering a multimedia era in which three industries will dominate: the platform industry, the distribution industry, and the content industry. We need to acquire other technologies if we are to be a leader." Hence the drive to develop new products.

Canon's Research Centre in Kanagawa is a large complex housing 229 researchers. The place is more

informal than you might expect from a Japanese workplace. Many of the staff are casually dressed and operate a flexi-time system which lets them choose the hours they work. Workers recline in easy chairs in a brainstorming room and bounce around ideas. After work, there's a games room where people can relax, have a beer or play the popular Japanese board game, Go.

One of Canon's biggest projects involves 80 workers developing a new flat-screen display. Many of the major Japanese electronics companies are investing much time and money in flat-screen systems such as LCDs, gas-plasma, plasma-addressed liquid crystals and all manner of exotic technologies. Major markets envisaged for flat-screen displays include PCs (notebook and desktop), in-car navigation systems and wall-hanging televisions. For some time now, Canon has been working on ferroelectric liquid crystal displays (FLCDs).

As the name suggests, FLCDs have a similar structure to ordinary LCDs. The FLCD molecules are sandwiched between glass plates and polarising filters. When a voltage is applied, the FLCD molecules change their orientation and, depending on the switching direction, will block light or let it pass through. FLCDs offer a number of advantages over conventional LCDs. They offer faster switching which means better contrast and resolution. They offer a wider viewing angle and are only several centimetres thick. What is more, they retain their memory when the power is switched off: you can switch off your PC monitor without losing the last screen display.

Canon began selling 15in FLCD monitors for PCs and workstations in Japan in January 1995, but at a cost of over several thousand pounds each they're not cheap. Canon admits FLCDs are too expensive when compared with ordinary LCD screens (which in turn cost far more than a conventional Cathode Ray Tube — CRT — display). Hence the move to a new type of flat screen display: the Surface Conduction Electron Emitter Display, or SED.

An SED works by coating electrons with an ultra-thin Palladium Oxide film and placing them on a quartz or sodalime glass substrate. On top is placed an array of phosphors, similar to ones used by conventional CRT displays. By applying a voltage, a stream of electrons are produced and these hit the phosphors, producing light.

SEDs offer some advantages over LCDs. They require a lower drive voltage and so are less power-hungry, and they have a wider viewing angle. An ordinary CRT display uses special circuits to focus the electrons on the correct line of phosphors, but SEDs don't need a focusing system so are simpler to construct.

Canon has developed a 3.1in SED prototype which, at present, requires a trolley-full of electronics to make it work. Using pictures sourced from a video-disc player, the SED device looks impressive. But more impressive is Canon's goal to convert this crude prototype into a commercial product by the year 2000. By this time, the company aims to launch a 40in SED set, which will be just ten centimetres deep and weigh around 18kg.

In the computer world, it seems you can never be too fast or have too much memory. When floppy disks

became too small, CD-ROMs arrived, and higher-density DVD-ROMs look set to supersede these. Canon is looking beyond optical disc technology for a new generation of memory systems which could store the equivalent of 200 CD-ROMs on a chip the size of a finger nail.

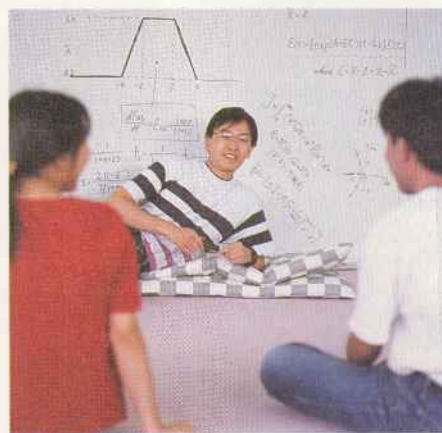
Like many new technologies, it's based on an old idea. Canon is using a substance called Langmuir-Blodgett (LB) film, which was discovered over 60 years ago. LB film is composed of organic molecules which are similar to those formed when soap floats on water. An ultra-thin film forms on top of the water, and when this is placed on a substrate you get an LB film.

In the mid-eighties, Canon discovered that by applying a voltage to certain types of LB films you could create a memory device. The voltage alters the resistance of the LB film, which is reversible, producing a switching memory. The LB memory uses an incredibly small probe which looks like a record-player stylus. The needle tip is atomic size and placed just above the surface of the LB film. A voltage is applied creating a minute recording spot that measures just ten nanometres across (a nanometre is one millionth of one millimetre). As a result, one terabit (one million million bits) of data can be recorded in one square centimetre, some 10,000 times greater than the recording density of a CD.

Don't throw away your CD-ROM or DVD-ROM drive yet, though. Canon has managed to develop LB memories that store kilobits of data rather than terabits. And the LB system won't be cheap either. Although LB memory devices open the way to storing large amounts of music and video on a chip, Canon thinks a more likely market will be for high-quality image processing and offering higher memory capacities for notebook PCs. But don't expect to see LB devices on the market for at least five years.

Another technology on the horizon is a high-speed LAN, delivering multimedia to

Bubblejet heads in production, employees involved in a brainstorming session, and Canon's HQ





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The PC market in Japan

In 1994, fewer than one in ten Japanese households had a PC. But in 1997, this figure is expected to reach one in five. As has happened in many countries around the world, the PC has turned into a consumer electronics item. Take a stroll around the Akihabara, the computer and consumer electronics centre in Tokyo which makes London's Tottenham Court Road look like a market stall, and you'll find loads of PCs, peripherals and software outlets — some department stores sell nothing but software. There are many Japanese hobbyists who like nothing more than building their own PCs, and at Akihabara you'll find every component you could need.

Around eight million PCs were sold in Japan in 1996 and, unlike many other territories, sub-notebook and notebook PCs sell well, accounting for about one third of the market. Around three quarters of home PCs have CD-ROM drives, and this year [1997] will see the arrival of the first DVD-ROM drives. DVD movie players went on sale in Japan in November 1996.

The PC market is dominated by the Japanese companies NEC and Fujitsu, which account for 40 percent and 18 percent of the market respectively. The top-selling Western PC brands are IBM (ten percent) and Compaq (less than four per cent). The Apple Macintosh has around 14 percent of the market. But when it comes to software, Microsoft rules, with Windows 95, Office and Word being some of the biggest-selling programs.

Another top-seller is a program called Ekispert (sounds like expert) which is used to calculate travelling expenses. Many Japanese employees spend a considerable time commuting to and from work, especially to major cities like Tokyo and Osaka. Ekispert presents users with an on-screen graphical display of train stations, and users simply click on the stations they use. The program then automatically calculates the cost. Ekispert is so popular that it comes pre-loaded on many home PCs.

Japanese consumers have also taken to digital

cameras, with around one million units expected to have been sold in 1996.

The internet has also exploded in Japan, with internet cafés springing up in major cities. According to Cyber Space Japan, there were over 200 ISPs in Japan at the beginning of 1996. The biggest group of internet users are aged 20 to 29, and 97 percent are male. Around three million people use online services.

Many consumer electronics companies are also offering products that span home computing and home entertainment. Sharp and Sanyo market televisions with built-in web browsers, with the latter selling around 2,000 units a month. Hitachi has developed a digital camera that records both still and moving video images on a PC Card. The 260-megabyte PC Card hard disk can store 2,800 still images, 18 minutes of MPEG-1 video, or about four hours of audio.

The Japanese electronics giants, Sharp and Fujitsu, have joined forces to launch a new type of online television guide called InterTV. The system offers an electronic program guide which displays the channel information in the form of a table on a PC screen. Users can customise the tables so that, for example, they display programmes by time, channel or genre. It is also possible to link up to web pages devoted to television personalities or television channels.

Fujitsu has developed special software that allows InterTV users to program their video recorder from their PC. Once the video timer has been sent, the data can be sent from the PC to the video recorder via an infra-red communication port.

Hitachi has developed the Interdisc, a CD-ROM which stores a mix of video clips, web pages and Netscape Navigator. The video clips use VHS-quality MPEG digital video, but PC users do not need a special video board to view them as all playback is done with MPEG software on the disc. Hitachi hopes that companies selling similar products or services will put their web pages onto an Interdisc CD-ROM.

the desktop. These networks will use fibre-optic links operating at speeds of up to 156Mb/sec. By comparison, ISDN offers speeds of up to 128Kb/sec. Canon is developing a multimedia LAN that will serve up to 32 PCs with video, sound, graphics and animation, but it won't reach the market for several years.

One technology that has arrived is a new bubblejet system which can be used for fabric printing. Canon launched its first bubblejet printer in 1981, and makes machines for Apple and Hewlett-Packard. Bubblejets use an array of ultra-fine nozzles, each one about half the thickness of a human hair. The nozzles are filled with ink which is heated. The heat causes a bubble to form, which expands and is then ejected from the nozzle. Each nozzle discharges 6,000 ink droplets a second. For comparison, a hummingbird flaps its wings 100 times per second.

"When we first developed the bubblejet, we wanted it to replace the dot-matrix printer," says Takashi Saito, director of Canon's Bubblejet Product Group. The speed at which inkjets (which includes bubblejets) have come to dominate the printer market is testament to the format's ability to offer near-laser print quality at affordable prices.

Around 60 million PCs were expected to be sold

around the world in 1996, along with 42 million printers. Dot-matrix printers were forecast to sell around six to seven million units, laser printers seven to eight million, and inkjets, a massive 30 million units. Inkjet technology is also used in faxes, photocopiers, electronic typewriters, standalone word processors and even notebook PCs with built-in printers.

Now, bubblejet technology is being used by the textile industry. Canon has invested about £30 million on the technology which can print on fabrics including cotton, silk, nylon, wool and polyester. Tests are also being done on leather and sheepskin. The bubblejet fabric printer is a massive machine which looks like a modern paper printing press and costs around £700,000.

The fabric printer prints at 360dpi and uses 9.6cm-wide print heads, each of which has 1,360 nozzles. There are eight ink stations and sixteen print heads arranged in two groups to allow two-way printing. The system offers up to 250 gradations of colour and prints at speeds of up to one metre per minute. The fabric printer can also print on materials up to 1.65 metres in width.

The fabric printing system uses special image transfer software which has a palette of 16.7 million colours. The

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Ichiro Endo, the man who discovered the bubblejet

If researchers were paid royalties on their discoveries which became commercial products, Ichiro Endo could have retired years ago. In 1977, Endo accidentally placed a soldering iron against a syringe full of ink and noticed that the ink squirted out. This led to the bubblejet printer. Bubblejets are Canon's fourth largest revenue earner, accounting for over £1.5 billion of sales. Today, Endo is managing director of Canon's New Products division, whose brief is to come up with products for the multimedia age.

Q How is the computer industry changing?

A In the past when people talked about computers and communication, the computer was the main part of the setup. But in the era of internet, intranets and extranets, the situation has changed. The computer is now part of a network and has started to merge with peripherals and AV [audio-video] equipment. The computer is becoming more transparent, and the input/output (I/O) device is becoming more critical as it becomes the interface between the user and the computer. Canon of course makes many I/O devices, such as scanners, printers and digital cameras.

Q We hear a lot about the paperless office. Will it happen?

A I think paper-based information and electronic-based information will remain, but people will want them to be seamless. Today, people copy documents onto paper and distribute them, but I think the model proposed by Hewlett-Packard, whereby people distribute documents electronically and print them locally, is more likely to grow.

Q How important are industry standards?

A We want Canon products to connect to each other and to others, so of course standards such as NetWare and Windows NT are important.

Q Who will be your main competitors in the multimedia age?

A In terms of Japanese companies, it will be giants like Toshiba, Hitachi and Matsushita [Panasonic/Technics/

JVC]. In our traditional markets, our consolidated sales are already higher than Xerox. I feel Hewlett-Packard is a strong potential competitor, although it is also an important partner.

Q You didn't mention any software companies in your list, such as Microsoft.

A My personal view is that the Wintel companies [Microsoft and Intel] are somewhat tied to the PC business, while others such as IBM, Sun and Oracle are moving towards the Network Computer. I'm not sure which will win the battle, perhaps we will see next year.

Q But in your model of the evolving computer, the PC would appear to be outdated.

A Maybe that's one interpretation, but at the same time, we should not underestimate the power Wintel has. In all honesty, we do not care who becomes the winner, as long as the I/O devices enjoy good business. What's more important is how we shift towards the human-centric side of computing.

Q What is being developed by the New Products Division?

A We have already produced a digital camera which is on the market [the PowerShot 600] and we are also developing an internet camera that can be linked to a computer anywhere in the world via the internet. So you could be in Japan and yet control a camera that was in Europe. Another product is the digital document distribution system (DDD) which will work with our digital copiers. After a document has been scanned, the software will govern where it is to be distributed. We are also developing flat-screen displays. And there'll be other products, but it's too soon to talk about them yet.



design artwork can be scanned into the system or taken from a CD-ROM or other storage medium. A PC carries out colour matching, editing and manipulation. The system runs under Windows and handles images from Adobe Photoshop.

Canon says that one of the system's big advantages is its speed. A production cycle, from design to printing, can take three days, compared with two months when using conventional fabric printing methods. Takashi Saito says that while Canon's system is in competition with rotary and flat-screen printing systems, it's not designed to replace conventional printing technologies: "If you want a fast turnover then our system is good," he says, "For instance, if you need to respond to fashion changes quickly. And if you are producing small orders of up to 50 metres; then our system is cheaper than traditional methods." He adds that the fabric printer is more environmentally friendly, as there is no waste ink or water.

But Saito admits that Canon's fabric printing system has drawbacks. The actual printing process is slow, which means higher costs. Saito says it's currently two to three times more expensive than other mass production systems but there are plans to halve this by increasing the printing speed. Vivid colours are not yet possible, and on some fabrics there is a small risk of ink rubbing off.

Even so, the Japanese company Kanebo is selling ties, scarves and other goods printed with Canon's system, and the Japanese designer, Issey Miyake, has produced leather coats printed with the bubblejet technology. Canon adds that several European companies are also interested in the technology. Another Japanese company, Okasei, is using bubblejet technology in card-vending machines on street corners which people use to make up personal and business cards.

New technologies like digital cameras and camcorders need good-quality hard-copy systems, and Saito showed what the next generation of bubblejet printers could be offering. Handing around large colour glossy prints made on a bubblejet, Saito asked the press to examine the quality. The resolution wasn't as good as that from a 35mm print but it was pretty damn close. This type of picture quality should be available in about a year.

Looking further to the future, Saito (who already has four bubblejet printers at home) foresees a time when televisions will have built-in web browsers for surfing the net: "Your television could also include a built-in bubblejet printer, for printing out reports from electronic newspapers," he says. It's the ability to generate lateral thinking like this that shows why Canon is likely to remain a major force in the multimedia age. ■



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If your bank balance is having a prohibitive effect on your PC purchasing power, a budget model might do the trick.

In December we looked at what sort of PC system you could get for around £1,300 (ex VAT). This time we've gone one step cheaper, and rounded up a group of PCs priced at around £850 (ex VAT). This is a remarkably cheap price tag for a PC, but nevertheless represents a large expenditure. The same money could buy you a decent little second-hand car that's relatively rust free, starts every time, and gets you from A to B with no unscheduled stops. In the pages that follow, we'll see if the metaphor can be applied to our PC contenders.

We asked manufacturers for a machine with a specific price tag, which had a 133MHz processor and 16Mb of RAM. We requested, but did not always receive, a starter pack of software. And we asked for the best monitor available within our budget. So if your dreams of owning a top-of-the-range PC are scotched by a reality check on your bank balance, and price is more of a consideration than performance, the ten systems we've gathered together here will show what you are likely to get for your money.

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Compiled by Lynley Oram

Bytewise Technology Swift P133

Bytewise, based in North London, has been making PCs for the last seven years. It is a small company, with a staff of seven and an annual turnover of about £1m.

Unfortunately, the Swift's parallel and serial ports are fitted to blanking plates which are in the way of two of the free PCI slots. Although Bytewise hasn't blocked off all the PCI slots, only one has a free blanking plate. This makes it difficult to install PCI cards at a later date without some serious tinkering.

A full-length card could be fitted into one of the two remaining "free" PCI slots. One slot is already occupied by the graphics card.

A 16-bit sound card, from BTC, took up one of the four ISA slots. There is one free, forward-facing 3.5in bay. Before installing anything into the spare 5.25in forward-facing bay, though, you need to remove a lump of cabling that's bound and stored there. Despite tucking most of it away, there is still enough spare cabling to obscure the RAM. A little dig around uncovered 16Mb taking up two of the four SIMM slots. There were also two vacant DIMM slots, although it's currently not recommended to mix SIMMs with DIMMs.

The Abit motherboard makes use of a Triton 430VX chipset and had 256Kb of on-board cache. Although there

is an empty CELP slot, it could be difficult to use: a fairly taut cable, linked to the processor's heatsink, ran right across it.

The magnetic shielding on the Juster speakers was minimal. Placing the speaker with the power pack next to the monitor wrought havoc with the image.

● **Monitor** The CTX wasn't bad for a budget 14in monitor. It only needed a little tinkering to remove the flicker. The plug-and-play monitor was Energy Star compliant and MPR II rated.



PCW Details

Hardware Bundle Juster Multimedia Speaker System.
Software Bundle Toplevel Complete Works.
Warranty Terms Three years RTB. On-site options are available.
Technical Support Toll-free support line, and fax support.
Price £910.63 (£775 ex VAT)
Contact Bytewise 0171 275 8853
Good Points A good price. Room for expansion and updates.
Bad Points More attention could have been paid to the build of this PC.
Conclusion A mediocre machine that deserved more attention during its manufacture.

Software Quality	★★★
Build Quality	★
Warranty	★★★
Overall Value	★★★

Choice Systems Ultra Multimedia P133

This machine differed from the rest of the PCs in our test as it came with a ten-speed Acer CD-ROM, rather than an eight-speed. This CD-ROM was quieter than the others we reviewed and had a slightly superior build quality. The asking price for this PC was one of the highest and it would be a matter of personal preference as to whether it would be worth paying a premium for these features in particular. However, it is a fast machine and achieved second place in our VNU Labs test.

The short tower case, a design which also houses the Paragon Intel P133 (see p140), is stiff and required some effort to get inside. Some of the cables obscured the RAM, which was a shame as the rest were neatly tied up out of harm's way. The 16Mb of RAM left two SIMM slots vacant, plus one empty DIMM slot.

Both the graphics card and the motherboard were made in Taiwan by TMC. The motherboard had been fitted with a Triton II 430VX chipset, and had 256K of on-board pipeline burst cache. The CELP slot was left vacant, making it possible to upgrade the cache at some time in the future.

A 1.2Gb Quantum Fireball hard drive completed the sub-system.

Only one of the three spare PCI slots will take a full-length card. The soundcard, a SoundBlaster 16 from Creative, filled one of the ISA slots. Even though it may be possible to fit a longer ISA card into one of the two remaining slots, this probably would not be desirable as the card would be pushed up against the processor. It was disappointing to find no software included.

● **Monitor** The 14in monitor, from AOC, is Energy Star compliant and MPR II rated. It had all the usual buttons, apart from degaussing.



PCW Details

Hardware Bundle Juster computer media speaker system.
Software Bundle None.
Warranty Terms 5-year RTB (first year parts and labour).
Technical Support Fax only.
Price £1,056.33 (£899 ex VAT)
Contact Choice 0181 993 9003.
Fax 0181 993 9936
Good Points Ten-speed CD-ROM. Vacant CELP slot.
Bad Points Stingy with the software.
Conclusion We would have preferred a larger monitor rather than the faster CD-ROM. A bit more thought should be put into the future of this machine.

Software Quality	★
Build Quality	★★
Warranty	★★★★
Overall Value	★★★

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Edge Conquistador P166+

Edge normally ships this PC with a Cyrix P166 processor, but in order to meet the specifications of our group test the processor supplied was an Intel Pentium 133 (the selling price remains the same).

The software that arrived with this PC was impressive. The bundle included Mechwarrior 2, Earthworm Jim, Pitfall: The Mayan Adventure, and Lotus SmartSuite 96 (which was in the box, but not loaded on the PC).

Any good feelings we had about this desktop evaporated when the casing came off. The innards were incredibly cramped and messy. The four SIMM slots were buried beneath layers of cabling, all of which would need to come out if you wanted to get to the 16Mb of RAM.

There were four ISA and three PCI slots, of which only two were occupied. Edge has made it difficult to use the remaining PCI slots, as all the adjacent blanking plates have been used for the parallel and serial ports. This effectively blocks the PCI slots, so you would need to be handy with a screwdriver if you wanted to fit any cards in here. With the remaining space filled with the processor and heatsinks, there is no room to fit anything other than half-sized cards into the ISA slots.

The sub-system comprises a Diamond Stealth 3D 2000 graphics card with 2Mb of RAM and a 16-bit Sound Adapter

sound card from KTX. The 1.2Gb Seagate hard drive sounded like there were pebbles rattling around inside.

Mitsumi made the keyboard, mouse, and the 8x CD-ROM drive that came with the machine. The KTX motherboard used a Triton III VX chipset and had 256Kb of on-board cache.

- **Monitor** The KTX 14in monitor suffered from noticeable flicker, even when we altered its controls. Its power-saving feature meets EPA requirements but we could not find any MPR II rating.



PCW Details

Hardware Bundle Advance speakers.
Software Bundle Mechwarrior II, Earthworm Jim, Pitfall, Lotus SmartSuite 96.
Warranty Terms Two years, back to base.
Technical Support Toll-free phone line and fax support.
Price £974.08 (£829 ex VAT)
Contact 0181 232 8811.
Fax 0181 232 8600
Good Points Good software bundle.
Bad Points Lacked future-proofing.
Conclusion A product quality rethink is overdue at Edge. It would not have taken much effort, and not a lot more time, to have turned this PC into a good little runner.

Software Quality	★★★★
Build Quality	★
Warranty	★★
Overall Value	★★

Express Micro Rapier ELS P133

Modems are getting cheaper, so it was great to see that at least one of our budget PCs came ready to hook up to the internet. The Choice modem used had a speed of 33.6Kbps and was BAPT approved. To get us browsing the web, a couple of net sign-up trials had been included.

The short tower casing made a definite style statement. We'd be happy to see the lilac buttons go, but recessing the LED display lights inside slots was an inspired move. The resultant soft glow evoked images of lounge lizards in smoking jackets, relaxing to Burt Bacharach music.

On the negative side, although this machine had some nice features, its performance let it down; it came last in our VNU Labs test. And, while its insides were not the messiest we saw, Express Micro could nevertheless improve its housekeeping.

Unnecessary cabling made it difficult to get to the RAM. And, with the power cable for the processor running directly over the Cirrus Logic graphics card, fitting cards in the future would be fiddly.

With various components cluttering the area, there is really only enough room to fit half-length ISA cards. But if size is your thing, there's room for larger PCI cards. The

motherboard had 256Kb of pipeline burst cache fitted into a CELP slot, and an Opti Viper chipset.

Frustratingly, Express Micro had forgotten to include a power plug in the PC's box. It's an easy item to leave out, but a vital component. It's rather like taking delivery of your new Ford Fiesta and discovering the manufacturer had forgotten to fit the ignition.

- **Monitor** While the 15in monitor from Videal looked good and had a flat screen, the image was badly focused and it didn't fare as well in testing as some of the 14in monitors in the group.



PCW Details

Hardware Bundle Arowana speakers.
Software Bundle Lotus SmartSuite.
Warranty Terms One year on-site. Option for three years on-site.
Technical Support Fax support.
Price £996.40 (£848 ex VAT)
Contact Express Micro 01909 530866.
Fax 01909 530966
Good Points At least the effort was made to include a 15in monitor even though the quality wasn't brilliant. Modem.
Bad Points Could be faster, tidier, and a bit less cramped.
Conclusion This PC has great potential. It also has features, such as the modem, that we would like to see more often.

Software Quality	★★★
Build Quality	★★
Warranty	★★
Overall Value	★★★

Fox Premier P133

The Premier P133 had a Cyrix P133+ chip running at a modest 110MHz. Fox was the only supplier to choose Cyrix for its machine and deserves a pat on the back, because the Premier outperformed most of the Intel

chips and came fourth in our VNU Labs test.

Fox has been generous with the software bundle, including a Microsoft Entertainment pack which contained MS Golf, Encarta 96, MS Works and Money, Creative Writer, and a Magic Bus CD-ROM for the kiddies.

Space is always at a premium in a desktop, yet there was no need for Fox to have clumped the cables together and jammed them into the gap between the graphics card and the power supply. Getting at the RAM and the four SIMM slots is almost impossible. Even with the cables out, installing extra RAM would probably have taken the skin off our knuckles, because one of the SIMM slots is awkwardly placed under the power supply.

The 256Kb of pipeline burst on-board cache can easily be upped to 512Kb as the Abit motherboard has a vacant CELP slot. Otherwise, there is very little room for expansion. None of the three PCI or four ISA slots will take cards longer than half size.

The 1.2Gb hard drive, from Quantum, had only been partially placed in its 3.5in bay. It had been pushed back from the front of the case by the

positioning of the power button, preventing the installation of lengthy cards nearby. Really, there is insufficient room to fit more 3.5in devices in the case, although it could be done if you were determined enough.

- **Monitor** At even its best settings, the 14in Samtron suffered a noticeable flicker. It is MPR II rated, and has a power management circuit.



PCW Details

Hardware Bundle JS Jazz J201 speakers.
Software Bundle MS Entertainment pack: MS Golf, Encarta 96, MS Works and Money, Creative Writer, and Magic Bus.
Warranty Terms Five years back to base. First-year parts and labour. Last four years labour only. Options for second and third year on-site.
Technical Support Standard phone call.
Price £994.44 (£846.33 ex VAT)
Contact Fox 0990 744500.
Fax 0990 502207
Good Points Room for increased cache.
Bad Points Cramped, messy and with little room for expansion, for either cards or devices.
Conclusion Not an ideal machine for those who want to add extras at a later date.

Software Quality	★★★
Build Quality	★★
Warranty	★★★★
Overall Value	★★★

Innovations Direct ID 3D2000 P133

This machine was let down only by its lack of speed, ending up second to last in our VNU Labs test. Apart from this, Innovations Direct has done a competent job of putting together a budget PC.

Things really improved once we got inside. Cables were neatly arranged and tucked out the way. The four SIMM slots were clearly visible and easy to get at. Two were occupied with 16Mb of EDO RAM, and these popped in and out with ease.

None of the motherboard's components were in the way of the three PCI slots, making future upgrades to full or three-quarter sized cards a doddle. Unfortunately, only one of the four ISA slots had room for a longer card. None of the slots were shared.

The sub-system consisted of a Diamond Stealth 3D 2000 graphics card and a Flagpoint FPS E1868 sound card. The Protac motherboard has 256Kb of pipeline burst cache and made use of an Intel Triton III 430VX chipset.

We were worried about the size of the Sanyo Denki heatsink, which was almost half an inch smaller than the processor. However, we were assured that

it would be able to do its job, despite being "horizontally challenged".

There was a reasonable amount of room left for extras. The company had opted to install a 5.25in 1.2Gb Quantum hard drive, leaving one empty forward-facing 5.25in bay. Of the three spare 3.5in bays, two were internal.

- **Monitor** An extra inch may not seem like much, but the Iiyama Vision Master 15 is miles ahead of the rest of the pack. The screen is flat, it is Energy Star and MPR II rated, and controls are on-screen and include all the adjustment controls you would expect.



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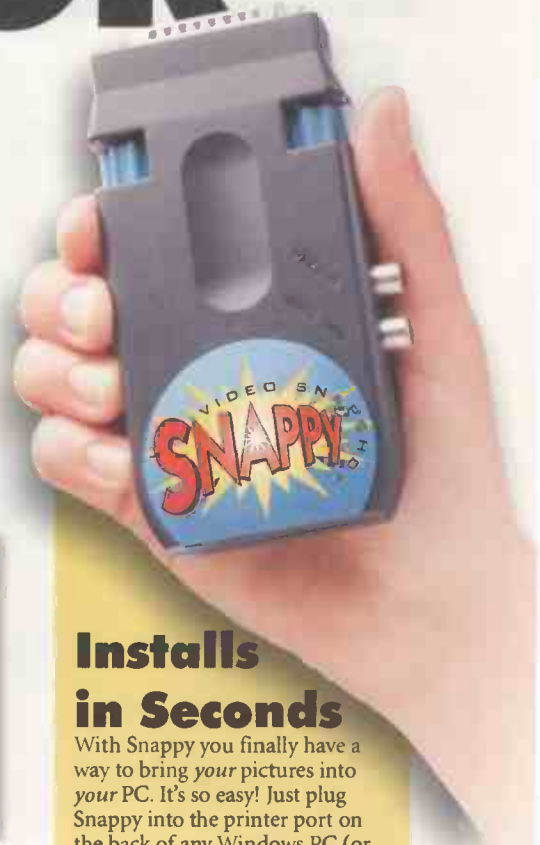
Hardware Bundle Labtec LCS950 speakers.
Software Bundle None.
Warranty Terms Five years RTB, plus advance replacement option.
Technical Support Fax.
Price £1,056.33 (£899 ex VAT)
Contact Innovations Direct 0181 923 6666.
Fax 0181 923 6655
Good Points Some space for upgrades, and for fitting extras. Long warranty.
Bad Points Quality control not up to scratch: the supplied power cable was faulty. Lacking in software.
Conclusion Definitely worth paying more for the larger monitor.

Software Quality	★
Build Quality	★★★★
Warranty	★★★★★
Overall Value	★★★★

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Paragon Intel P133

There is nothing intrinsically wrong with this PC, but there is nothing to get excited about either. If price is your sole consideration when buying a computer, then Paragon has put together the ultimate no frills budget model. It's not a fast machine, but then, this PC wasn't built for speed.

We were puzzled about why the 1.2Gb Seagate hard drive and Samsung 8x CD-ROM drive were connected to the same EIDE channel, leaving the second EIDE channel connector vacant: in past tests, we have found that this arrangement can slow hard drive performance while the CD is in operation.

Most of the components were inexpensive yet fairly respectable. The Intel motherboard uses an Intel 430VX chipset, and there's 256Kb of pipeline burst cache in a CELP slot. The Opti sound card is 16-bit SoundBlaster compatible and the graphics card has 1Mb of video memory. There's enough room to fit three-quarter length cards into some of the PCI and ISA slots. Serial and parallel ports have been inconveniently placed in one of the PCI blanking plates which will have to be moved if you want to make use of the two spare PCI slots.

Paragon has been a bit careless with its cables; they were hastily bundled and obtrusive. We could just about get to the RAM without having

to remove any cables. Of the four SIMM slots, two were occupied by 16Mb of RAM.

If you think you may want to spend more money in the future, there's room inside for a couple of extra devices. The short tower has two spare forward-facing bays (5.25in and 3.5in).

● **Monitor** The 14in Targa monitor is MPR II rated and Energy Star compatible. On a negative note, the power cable had to be jiggled about before the display would work.



PCW Details

Hardware Bundle Multimedia speakers.

Software Bundle None.

Warranty Terms Three years return to base (first year with parts and labour; second and third years, labour only). Option for three years on-site.

Technical Support Free lifetime telephone and fax support.

Price £880.08 (£749 ex VAT)

Contact Paragon 0181 478 8700.

Fax 0181 478 0001

Good Points Excellent technical support, backed by a good warranty.

Bad Points Single channel for the CD-ROM and hard drive. Ports in the PCI blanking plates.

Conclusion An inexpensive machine, okay for a first-time buyer, but could have been a bit more generous with the software.

Software Quality	★
Build Quality	★★
Warranty	★★★
Overall Value	★★★

Roldec Pro P133

Roldec has set out to make a sturdy budget PC, and it is on the right track with this model. From the point of view of configuration it doesn't particularly stand out from the crowd, but in testing it performed well, taking third place on our Labs test chart.

Roldec hasn't lavished money on the casing: one of the screws was badly threaded and had to be coaxed off, and the case needed a few thumps to get it back on.

The machine came with Lotus SmartSuite ready-installed. The innards were tidy, if a little cramped. Out of the four ISA slots, there's really only room to fit one full-sized card. It may be possible to squeeze in two, three-quarter sized, cards.

The sound card occupying one of the ISA slots was a respectable SoundBlaster Vibra 16 from Creative Labs, and a Diamond Stealth Video 2500 graphics card has been fitted into a PCI slot. That left two PCI slots spare, and three ISA slots free, with one shared.

Two of the four SIMM slots were

occupied by 16Mb of RAM. These were easy to get at but not so easy to get out. The machine was fitted with 512Kb of cache. Externally, the computer had one spare forward-facing 5.25in bay and a spare external 3.5in bay.

The keyboard certainly rates a mention. It was nicely contoured and stylish but, more importantly in these days of RSI awareness, it came with a clip-on wrist rest.

● **Monitor** The image from the Princeton 14in monitor was easy on the eyes, and the screen was Energy Star compliant and MPR II.



PCW Details

Hardware Bundle Juster multimedia speakers.

Software Bundle Lotus SmartSuite.

Warranty Terms Two years RTB, with one or two years on-site options.

Technical Support Free phone support. Fax support.

Price £998.75 (£850 ex VAT)

Contact Roldec 01902 456464.

Fax 01902 452592

Good Points Monitor. Keyboard. Software.

Bad Points Lacked the room for longer PCI and ISA cards.

Conclusion A good, if unexciting, machine.

Software Quality	★★★
Build Quality	★★
Warranty	★★
Overall Value	★★★

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• **Software on CD-ROM:** CorelDraw! 4, Claris Works 95, Quicken 4 Accounts, Lotus SmartSuite 96: (WordPro 96, Approach, Organizer, 1-2-3, Freelance Graphics & Smartcenter), Hutchinsons Multimedia Encyclopedia 96, ITN Video Atlas of Europe, TurboCad, Pipex Dial - Free Internet Trial, Maths Workshop, Professor Windows 95, Bodyworks, Megarace 2000, Creator, Route 66, World Book Multimedia Encyclopedia, AnyTime Organiser, Slay, Rats, World Atlas, Dogz, Cyberspeed, Assault Rigs, Mech Warrior 2, Wipeout & Netscape Navigator. (All software supplied on CD-ROM with on-line documentation where appropriate).

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Personal Computer World

Good Points: Software bundle, large hard disk, excellent graphics card. **Bad Points:** None **Conclusion:** Twelve speed CD-ROM, 3.2 Gb HDD. ATI graphics card who could want for more. Great specifications and good selection of software make this an attractive choice... (PCW Proteus review Feb 97)

PC Pro

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 - Lifetime Technical Support
 - **Software on:** Windows 95, otu Smartsuite 96 (WordPro 96, Approach Organizer, 1-2-3, Freelance Graphics & Smartcenter) Claris Works 95, Corel Draw 4, Quicken 4, Pipex Dial, WorldBook Multimedia Encyclopedia, Anytime Organiser, Slay, Rats, Pipex Dial - Free Internet Trial, Dogz, World Atlas Netscape Navigator & Cyberspeed.
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Personal
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Stak Trading Diamond Discovery

Having seen so many examples of sloppy workmanship, this machine was a joy to behold. It had been put together with care and we liked the way the motherboard had been arranged. It had twice as much cache as most other PCs in this group, with half of the 512Kb cache on-board and half installed in a CELP slot.

A quick glance at our VNU Labs test results shows that this PC was the fastest in the group. Oddly, Stak has opted to connect both the CD-ROM drive and the 1.6Gb hard drive to the same EIDE channel and, as could be the case with the Paragon (see p140), this may slow down the operation of the hard drive. There is a spare EIDE connector vacant.

All the cables had been glued into position to keep them in place during transit. According to the company, the glue should just peel off. This wasn't as easy as it sounded and needed a flat-edged tool. There were four PCI slots, with only one occupied and none shared. A VideoLogic Grafixstar 400 graphics card took up one of these, and it would be possible



to fit a full-length card in here. A three-quarter sized card is as large as will fit in the ISA slots. The 16Mb RAM could be removed with ease and along with the four SIMM slots there was a DIMM slot. Stak gained status by including a Logitech Pilot mouse and Creative speakers, and the software bundle is substantial.

● **Monitor** For its size, the 14in monitor from ADI produced one of the best images in our test. The screen regulation was excellent and the picture was flicker free.

PCW Details

Hardware Bundle Creative CS120 speakers.
Software Bundle MS Encarta 96, Actua Soccer, Disney's Toy Story, and Hunchback of Notre Dame.
Warranty Terms 1-year RTB; no options.
Technical Support Customer service number. Fax support.
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Contact Stak Trading 01788 577497. Fax 01788 544584.
Good Points Cache. Performance. Mouse.
Bad Points Glue. Single channel for the CD-ROM and hard drive.
Conclusion A good machine for beginners, and offers future potential for more experienced users on a tight budget.

Software Quality ★★★★★
 Build Quality ★★★★★
 Warranty ★★
 Overall Value ★★★★★

Tiny P133 Multimedia System

Most of the computers in this test had Intel chips but this was one of two that didn't. Instead, Tiny has gone for an AMD K5 PR133 processor, with a speed of 100MHz.

Despite the slower speed, this PC still managed a respectable sixth place in our VNU Labs test.

The company hasn't been stingy with the software. This machine came with a whole bag of software goodies, from MS Works to Actua Soccer.

We had to invest a lot of elbow grease in removing the casing. There's one screw to remove and the casing should then just slide off — at least, that was the theory. In reality, it took two people to open it. Once in, though, there was a whole pile of cabling to be moved out of the way before we could get at the RAM. Two of the four SIMM slots had been fitted with 16Mb of RAM, with a DIMM slot left vacant.

The VideoLogic Grafixstar 400 card had been fitted into one of the two PCI slots (there were four in total) that would take a longer than half-length card. There were three ISA slots, one of which was occupied by a Crystal 16 sound card. The



motherboard was one of Tiny's own, a Spear SR-M504, and had been fitted with 256Kb of on-board pipeline burst cache.

There were two spare 5.25in bays, one of which was internal.

Forget fitting any 3.5in devices though: there's one internal bay spare, but we would have had to take out the 1.3Gb Fujitsu hard drive to get at it.

● **Monitor** The SM483C 14in monitor, made in Korea by Samsung, produced a good picture and was Energy Star compliant.

PCW Details

Hardware Bundle Unbranded speakers.
Software Bundle Encarta, MS Works and Money, MS Dangerous Creatures, plus 3D games: Mechwarrior, Terminal Velocity, Havoc and Actua Soccer.
Warranty Terms One year back to base; options for first, second and third years on-site.
Technical Support Fax support.
 Price £962.33 (£819 ex VAT)
Contact Tiny 01293 821333. Fax 01293 822514.
Good Points Software.
Bad Points Messy and cramped inside.
Conclusion Not a bad machine, but could do with more room inside for fitting extra devices.

Software Quality ★★★★★
 Build Quality ★★
 Warranty ★★
 Overall Value ★★

VNU Labs Report: How we did the tests

Different types of applications measure different aspects of a PC's performance, so it is important to use more than one benchmark to gain an accurate and rounded picture of each machine. With each successive PCW group test new technology appears, therefore our tests are continually enhanced to reflect these changes.

Each of the ten machines reviewed here has been put through two separate tests. The first is a standard system-level test designed to closely simulate real-world use. Complete versions of industry-standard Windows 95 applications are installed (currently Word, Excel, WordPerfect and FoxPro) so that performance can be assessed in the three key areas of word processing, spreadsheets and databases.

A collection of macros is then run in each application and every process is timed and recorded. When a copy operation in a spreadsheet is about to take place, the application macro containing the {COPY} instruction will first trigger the stopwatch. When the copy has completed, the time taken is written into a database file. Each test is run three times to provide a consistency check, and the performance score recorded for each application test is averaged out to produce one overall figure.

The second is a low-level benchmark test run in DOS (native mode) measuring the frame-rate performance from Doom 2. You can try this test on your own PC. Quit Windows or shut down and restart in MSDOS mode, set up Doom 2 to run full-screen (no status bar or sound), then exit. At the command prompt in the Doom

directory, type
DOOM2 -
TIMEDEMO
DEMO1

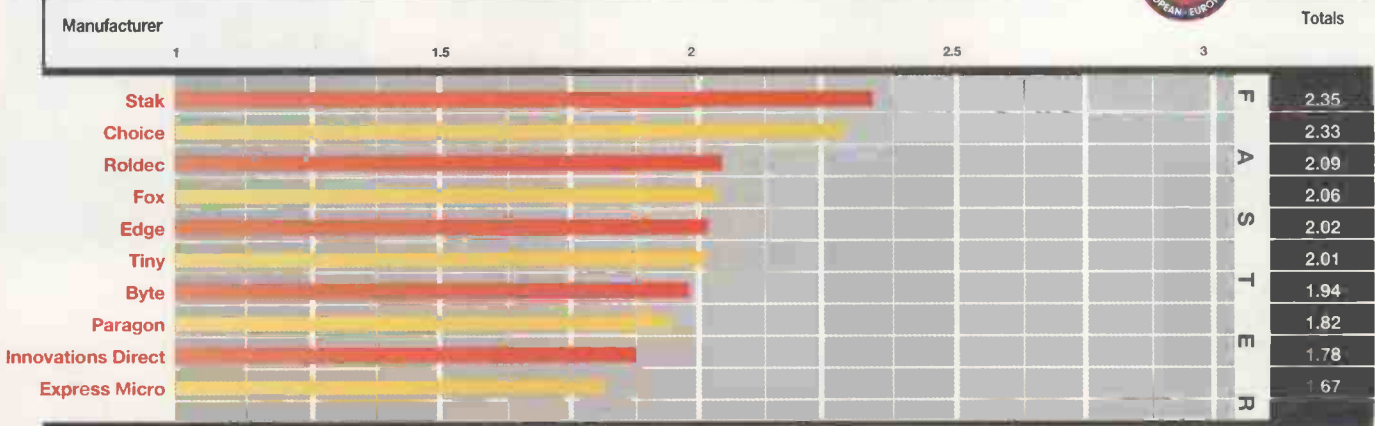
which starts one of Doom's demos. It runs for a short time and then exits, producing two figures. Divide the first by the second and then multiply by 35. The final figure is a measurement of frames rendered per second (see the Results graphs, below) where bigger is faster and better.

The Doom 2 test is an important low-level test which particularly stresses the graphics card, processor and hard disk, and gives a good impression of how the machine will perform while running games which are resource intensive.

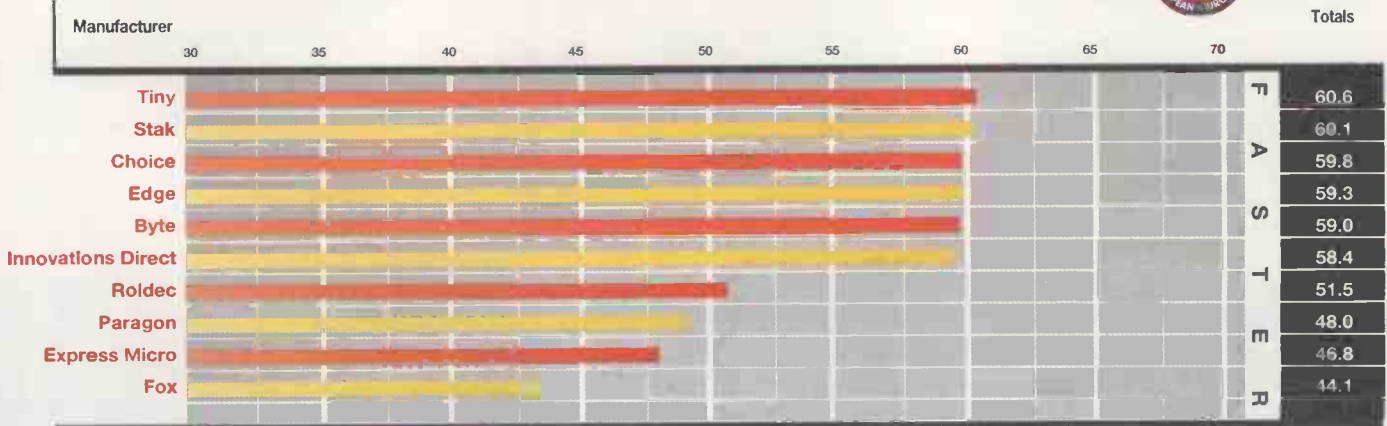


Eleanor Turton-Hill

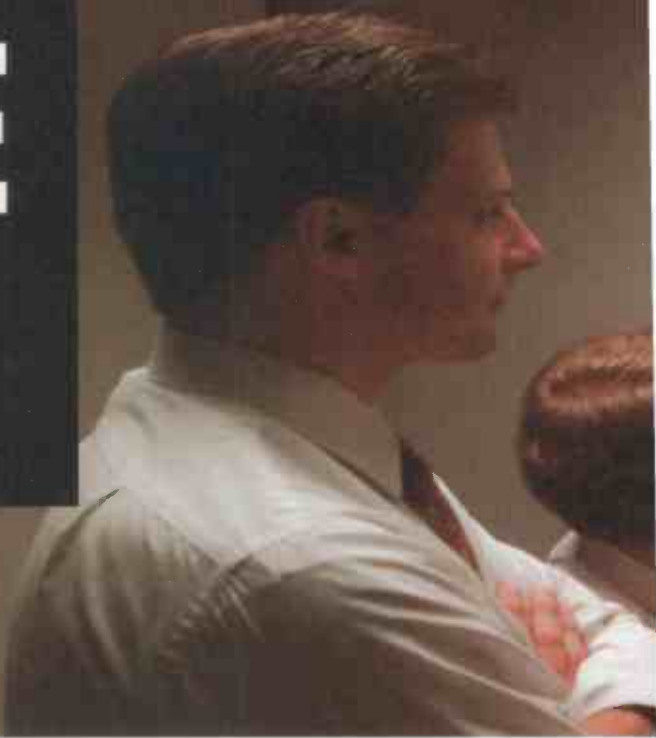
Windows 95 Office application benchmark test results



Doom 2 benchmark test results (frames per second)



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†† Lock secures both Millennium TransPort and MicronDock™ Multimedia Port Replicator

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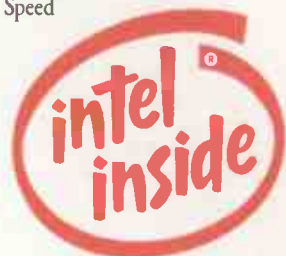
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Personal
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**Editors
Choice**

Editor's Choice

This group test taught us a thing or two about budget PCs. We were surprised at the variable quality of the machines and the sort of features a computer from the lower end of the market could offer.

Of course, we're not talking about state-of-the-art 3D graphics cards or Zip drives here. We were pleased enough that one of the PCs came with an internal modem, and that a couple of companies opted for 15in monitors.

When we first drew up the specifications for this group test, we were going to ask for a 120MHz processor. However, many companies we approached had dropped that model and were installing 133MHz chips into entry-level machines. There was a bit of variety here, with eight of the machines using Intel chips, one opting for Cyrix and another choosing an AMD processor.

Typically, these budget PCs came with a 1.2Gb hard drive, 256Kb of Level-2 cache, a basic 16-bit sound card, 8x CD-ROM drive, average 14in monitor and very little software. There were a few exceptions. Express Micro managed to get an internal modem into its machine; a definite plus, and one we'll hopefully be seeing more of at this level. Choice installed a slightly faster 10x CD-ROM, and there were a couple of lockable cases from Bytewise and Fox.

The winner of our Highly Commended award, Innovations Direct, went for a 15in monitor which in our opinion is a wise choice. Several manufacturers tend to use 14in and 15in respectively as code for poor or good quality monitors. Innovations Direct came close to getting our Editor's Choice award, but was let down by its speed and lack of software. What did push it to the top of the heap was its lengthy warranty — five years return to base. The advance replacement option could prove to be very handy if you were relying on this machine to help run a small business.

Both Roldec, and the winner of our Editor's Choice award, Stak, had opted to



install 512Kb of cache. Performance alone didn't influence our decision as there was very little difference between the top speed of Stak's machine and the second fastest performance of Choice's PC.

What really clinched the award for Stak was the care and attention that had gone into putting its system together. Someone who's opting to buy a budget PC probably won't be spending much more money on replacing peripherals. Stak has thought of this and has included some goodies, like a Logitech mouse and Creative speakers.

For regular readers of PCW, who drool over the latest gear but haven't got the money to match, Stak's PC has some future-proofing features. The insides were tidy, with easy access to its components, and there was room to fit extras. Another plus was the Western Digital hard drive, which had a sizeable 1.6Gb-worth of storage space. What also appealed to us was the something-for-everyone software bundle that came with this machine. For the ultimate software package though, Edge came up trumps, including Lotus SmartSuite

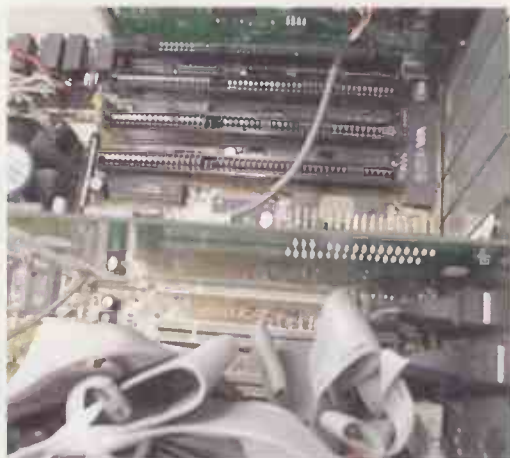
as well as some stonking games like Mechwarrior II and Pitfall.

We were bothered by the level of build quality encountered with most, although not all, of these PCs. Unnecessary and messy cabling that, in various machines, obstructed access to the RAM, covered a CELP slot, or blocked in a graphics card. Serial and parallel ports unnecessarily fitted to the PCI blanking plates. A missing power cable. Cramped motherboards with no room to fit longer cards. Dodgy casing... the list goes on. Although most people would not expect to be able to buy a top-of-the-range item from for £850 (plus VAT), we do not think it is unreasonable to expect a PC to have been competently put together.

The overall impression given by all this is one of companies not willing to waste their time for such relatively trifling sums of money. This attitude sells the company short as well as its customers. After all, these are customers who may think they only want a budget PC today. But once bitten by the bug, who knows what they could end up buying tomorrow. ■

How not to build a PC: These photos show an alarmingly common mistake made by several of the manufacturers featured in this group test.

Right Despite being able to mount the serial and parallel ports directly onto the case, they have instead been fitted to blanking plates and, worst of all, screwed into the gaps of the spare PCI slots. These plates would have to be removed and relocated to fit more PCI cards, and that's if you can get past the maze of cabling. **Far right** Notice the serial and parallel ports on blanking plates next to the video card where other PCI cards should go, and the tragically unused punch-out holes in the case



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There seems to be an unwritten rule with computers. No matter how large the hard drive, you'll eventually find a way to max it out. Unless, of course, you get one that never really fills up, right? For example, the EZFlyer™ 230, the latest removable cartridge hard drive from SyQuest®. Don't let the small 3.5 inch cartridge deceive you, this thing is huge. 230 megs that rip along at twice the speed of any removable in its class.

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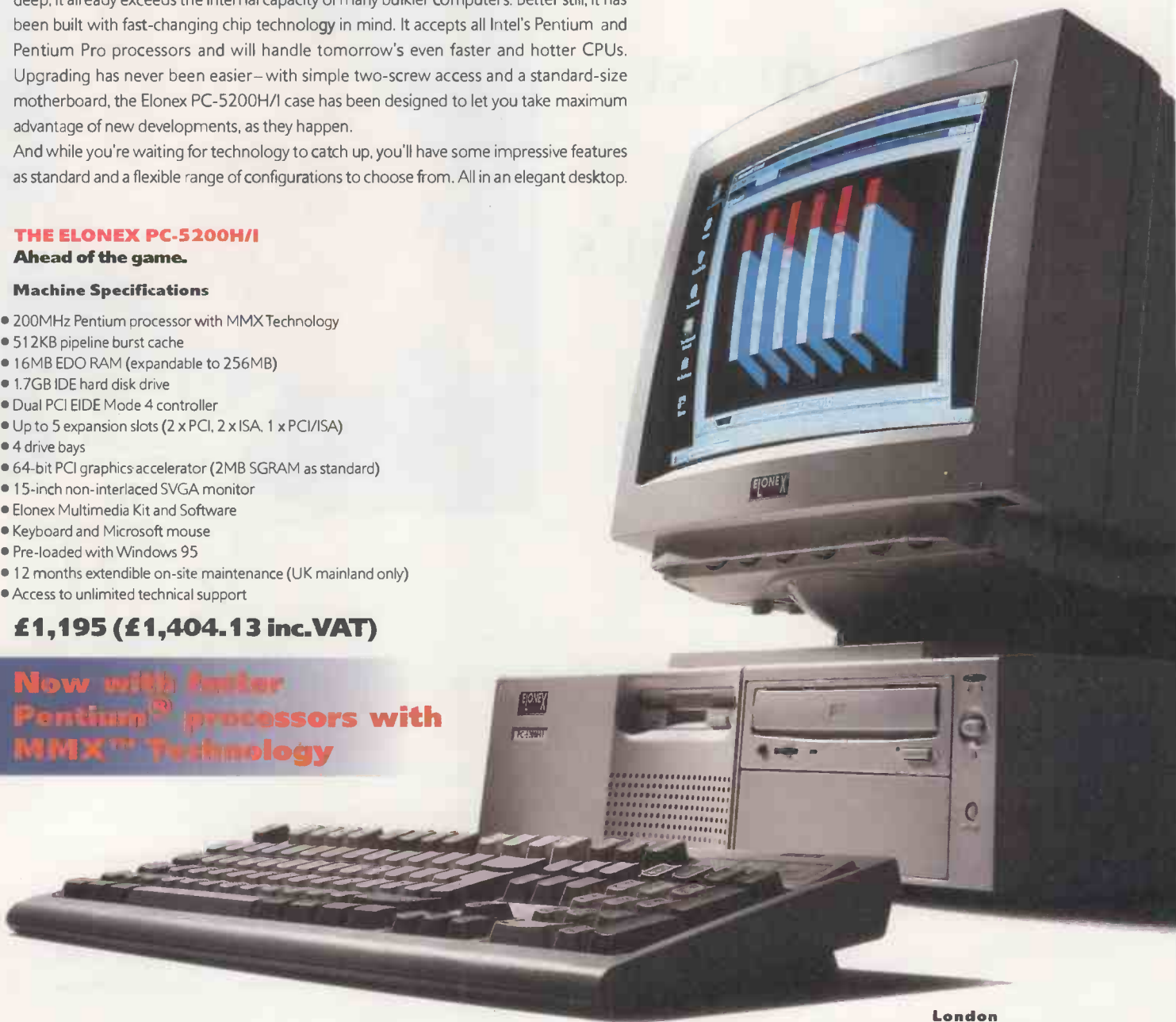
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Table of Features

					
Manufacturer	Bytewise Technologies	Choice Systems	Edge	Express Micro	Fox
Model	Swift P133	Ultra Multimedia P133	Conquistador P166+	Rapier ELS P133	Premier P133
Tel No.	0171 275 8853	0181 993 9003	0181 232 8811	01909 530866	0990 744500
Fax	0171 275 8344	0181 993 9936	0181 232 8600	01909 530966	0990 502207
Price	£910.63 (£775 ex VAT)	£ 1,056.33 (£899 ex VAT)	£974.08 (£829 ex VAT)	£996.40 (£848 ex VAT)	£994.44 (£846.33 ex VAT)
Processor	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Cyrix 6x86 133
PCI slots	3	3	3	3	3
ISA slots	4	4	4	4	4
Shared slots	1	1	0	0	0
Motherboard manufacturer	Abit	TMC	KTX	Protac	Abit
Motherboard model	PR5	PCI ISTV	8500	MB 75-200	Triton III
Chipset	Triton 430VX	Triton 430VX	Triton 430VX	Opti Viper	Triton 430VX
No. of spare 3.5in bays	1	1	1	2	-
No. of spare 5.25in bays	1	1	2	1	2
Hard disk					
Manufacturer	Seagate	Quantum	Seagate	Seagate	Quantum
Model	ST31276A	Fireball 1280 AT	ST31276A	ST51270A	Fireball 1280 AT
Size (Gb)	1.3Gb	1.2Gb	1.2Gb	1.2Gb	1.2Gb
Interface	EIDE	EIDE	EIDE	EIDE	EIDE
Average access time (ms)	12	11	11	10	11
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max. RAM	128Mb	128Mb	128Mb	128Mb	128Mb
RAM type	EDO	EDO	EDO	EDO	EDO
Secondary cache (Kb)	256	256	256	256	256
Max. secondary cache (Kb)	512	512	512	512	512
Cache type	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst
Multimedia					
CD-ROM manufacturer	Hitachi	Acer	Mitsumi	Goldstar	Hitachi
CD-ROM model	7930	10x/Zuego	FX810	GCD-R54C	CDR 7930
CD-ROM speed	8x	10x	8x	8x	8x
Sound card manufacturer	BTC	Creative Labs	KTX	Advance Logic	Aztec
Sound card model	16-bit	SoundBlaster Vibra 16	16-bit Sound Adaptor	ALS Sound Card 16-bit	16-bit B&P
Graphics					
Graphics card manufacturer	miro	TMC	Diamond	Cirrus Logic	Spitfire
Graphics card model	2Mb DRAM 64-bit	S3 DRAM	Stealth 3D 2000	5434 PCI	1Mb PCI
Graphics card RAM/Max. RAM	2Mb/2Mb	1Mb/2Mb	2Mb/4Mb	1Mb/2Mb	1Mb/1Mb
Monitor manufacturer	CTX	AOC	KTX	Videal	Samtron
Monitor model	1451C	4V	XPM-1000	PV 1564A	SC-428
Monitor size (inches)	14	14	14	15	14
Monitor NI refresh at 800 x 600	72Hz	72Hz	72Hz	100Hz	60Hz
Other Information					
Modem included?	○	○	○	●	○
Modem speed	-	-	-	33.6Kbps	-
Speakers	Juster Multimedia	Juster Multimedia	Arowana	Arowana	JS Jazz J201
Software supplied	TopLevel Complete Works	○	Mechwarrior II, Pitfall, Earthworm Jim, Lotus SmartSuite 96	Lotus SmartSuite	MS Entertainment Pack
Standard warranty	3-yr RTB	5-yr RTB (1st year parts and labour)	2-yr BTB	1-yr on-site	5-yr BTB. 1st yr parts & labour; last four years labour only
Warranty options	On-site	○	○	3-yr on-site	2nd & 3rd yrs on-site
Tech support line	●	○	●	○	●
Fax support	●	●	●	●	-
Company turnover *	£1m	n/a	n/a	£8m	£5m
Number of staff	7	6	20	63	21

KEY

● Yes ○ No * (most recent figures available)

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- 12 Months Stak Premier Service Warranty
- Win 95 Pre Loaded Latest Version with Disks and Manuals

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- Enhanced IDE Controller
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- Medium Tower Case
- 14" ADI SVGA Non-Interlaced low radiation monitor
- 3.5" floppy drive
- 105 key UK Windows Keyboard
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pentium	intel (INC VAT)	Non Intel CPUS (INC VAT)
P100		579/630.33
P120	599/703.83	589/692.08
P133	629/739.08	609/715.58
P150	649/666.50	619/727.33
P166	739/868.33	639/750.83
P200	879/1032.83	699/821.33

pentium	intel (INC VAT)	intel MMX (INC VAT)	Non Intel CPUS (INC VAT)
P100			639/750.83
P120	669/786.08		649/762.58
P133	689/809.58		659/780.08
P150	709/833.08		679/797.83
P166	799/938.83	849/866.50	699/821.33
P200	939/1103.33	979/1150.33	769/903.58

pentium	intel (INC VAT)	intel MMX (INC VAT)	Non Intel CPUS (INC VAT)
P100			809/950.58
P120	839/985.83		819/962.33
P133	859/1009.33		839/985.83
P150	879/1032.83		849/997.58
P166	969/1138.58	1019/1197.38	869/1021.08
P200	1109/1303.08	1149/1350.08	939/1103.33

* WINDOWS 95 SUPPLIED ON CD ROM WHERE A CD ROM DRIVE IS FITTED OTHERWISE SOFTWARE IS ON FLOPPY DISK
PICTURES SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY AND MAY DIFFER FROM ACTUAL HARDWARE SUPPLIED. SOME SYSTEMS SHOWN WITH OPTIONAL SPEAKERS

**SEE OUR
HARDWARE
PAGE
ALSO ON
PAGE 375**

Stak upgrades for Stak Diamond systems

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ADI 15" SVGA Non-Interlaced digital monitor	£59	69.35
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ADI 17" Microscan.26 dp	£259	304.33
ADI 21" Monitor	£899	821.33
INPUT DEVICES		
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High quality Natural keyboard	£25	29.38

Microsoft Natural keyboard	£39	45.83
2 Button ergonomic mouse	£10	11.75
SOFTWARE		
NEW MS NT 4.0 OEM Workstation (REPLACES 95)	£79	92.83
MS® 6.22 + Windows FW 3.11 (REPLACES 95)	£10	11.75
MSWorks '95 OEM	£39	45.83
MSOffice '95	£159	176.50
MSOffice '95 PRO	£229	269.08

Multimedia Options

We can fit any of the Multimedia bundles shown in our Multimedia Matrix on Page 375 at the prices shown. Special offer for systems the Creative SoundBlaster Discovery Pack Only £145-170.33 (INC VAT) includes 8 speed CD Rom, SoundBlaster 32 soundcard, speakers and software. Call for full details

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Specifications & Prices are subject to change without prior notice. Delivery charged at Business Post courier rates. E&OE. All trademarks & registered Trade Marks are acknowledged. SPS applicable to UK mainland only. Pictures shown are for illustration purposes only and may differ from actual hardware supplied. Some systems shown with optional speakers.

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Table of Features

Manufacturer	Innovations Direct	Paragon Computers	Roldec Systems	Stak Trading	Tiny
Model	ID 3D2000 P133	Intel P133	Roldec Pro P133	Diamond Discovery	P133 Multimedia System
Tel No.	0181 923 6666	0181 478 8700	01902 456464	01788 577497	01293 821333
Fax	0181 923 6655	0181 478 0001	01902 452592	01788 544584	01293 822514
Price	£1,056.33 (£899 ex VAT)	£880.08 (£749 ex VAT)	£998.75 (£850 ex VAT)	£998.75 (£850 ex VAT)	£962.33 (£819 ex VAT)
Processor	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	AMD PR133
PCI slots	3	3	3	4	4
ISA slots	4	4	4	3	3
Shared slots	0	0	1	0	1
Motherboard manufacturer	Protac	Intel	Abit	Ten Technologies	Tiny
Motherboard model	MB5200	Intel Pentium VX	PN5	PT-2006	Spears SR-M504
Chipset	Triton 430VX	Triton 430VX	Triton 430HX	Triton 430VX	Triton 430VX
No. of spare 3.5in bays	3	1	1	1	0
No. of spare 5.25in bays	1	1	1	2	1
Hard disk					
Manufacturer	Quantum	Seagate	Quantum	Western Digital	Fujitsu
Model	QBF 1280 A	ST31276A	Fireball 1280 AT	Caviar 21600	M1636
Size (Gb)	1286Mb	1.2Gb	1.2Gb	1.6Gb	1.3Gb
Interface	EIDE Mode 4	EIDE	EIDE	EIDE	EIDE
Average access time (ms)	15.5	11	11	11	11
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max RAM	256Mb	128Mb	128Mb	128Mb	128Mb
RAM type	EDO	EDO	EDO	EDO	EDO
Secondary cache (Kb)	256	256	512	512	256
Max. secondary cache (Kb)	512	512	512	512	256
Cache type	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst
Multimedia					
CD-ROM manufacturer	Hitachi	Samsung	Samsung	Creative	Goldstar
CD-ROM model	CDR 7930	SCR-830E	SCR-830	SCR-8300c	GCD-R580B
CD-ROM speed	8X	8x	8x	8x	8x
Soundcard manufacturer	Flagpoint	Opti	Creative Labs	Creative Labs	Crystal
Soundcard model	FPS E1868	16-bit SoundBlaster compatible	SoundBlaster Vibra 16	SoundBlaster 32 PNP	Crystal 16
Graphics					
Graphics card manufacturer	Diamond	Sigma Design Magic	Diamond	Videologic	Videologic
Graphics card model	Stealth 3D 2000	TR10 64V	Stealth Video 2500	Grafixstar 400	Grafixstar 400
Graphics card RAM/Max. RAM	2Mb/2Mb	1Mb/2Mb	2Mb/2Mb	2Mb/2Mb	2Mb/4Mb
Monitor manufacturer	Iiyama	Targa	Princeton	ADI	Samsung
Monitor model	MF8515F	M145 PNLD	E040	Provista	SM483C
Monitor size (inches)	15	14	14	14	14
Monitor NI refresh at 800 x 600	100Hz	75Hz	72Hz	72Hz	72Hz
Other Information					
Modem included?	○	○	○	○	○
Modem speed					
Speakers	Labtec LCS950	Juster Elite	Juster Multimedia	Creative CS120 Speakers	Unbranded
Software supplied	○	○	Lotus SmartSuite 96	MS Encarta 96, Actua Soccer, Disney's Toy Story, and the Hunchback of Notre Dame	MS Works & Money, MS Encarta 96, Havoc, Dangerous Creatures, Mechwarrior, Terminal Velocity, Actua Soccer
Standard warranty	5-yr RTB	3-yr RTB (1st, parts & labour; 2nd & 3rd, labour). Free lifetime technical hardware support	2-yr RTB	1-yr RTB	1-yr BTB
Warranty options	Advance replacement	3 years on-site	1- or 2-year on-site options	○	1, 2 & 3 yrs on site
Tech support line	○	●	●	●	○
Fax support	●	●	●	●	●
Company turnover *	n/a	£3m	£7.5m	£8m	£100m
Number of staff	n/a	9	51	25	330

KEY ● Yes ○ No * (most recent figures available)

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- Desktop or mini tower case
- 2Mb Integrated 64 bit graphics accelerator with full screen MPEG
- 3 ISA and 4 PCI slots
- 3.5" diskette drive
- Two serial ports with 16550 UART
- One ECP/EPP parallel port
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- Latest MS Windows NT workstation
- Full tower case
- 3 ISA and 4 PCI slots
- 3.5" diskette drive
- Two serial ports with 16550 UART
- One ECP/EPP parallel port
- 105 key Alps keyboard and Locland mouse
- MS Windows 95 with all disks and manuals

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A stylized illustration featuring a woman in profile on the left, wearing a red shawl and looking towards the right. In the foreground, a computer monitor sits on a red surface, with a mouse to its right. On the right side, a man in a suit is shown in profile, holding a mobile phone to his ear. The background consists of a blue field with a large, dark, curved shape. The text 'Money talks' is overlaid on the bottom left of the monitor.

Money
talks

James Taylor looks at choosing small-business accounting software and reviews ten packages.

Once, it was clear cut: large corporations used large corporate software at large corporate prices. One-man businesses made do with a cheap, cashbook-only, program. Small businesses could use a mid-range, integrated package. All three categories of software are still available but the distinctions have become blurred.

The idea of what constitutes a mid-range package is now quite elastic. On a comparison of features, several packages thought of as being at "entry level" are capable of providing all the accounting functions needed by small businesses. Competition among mid-range, integrated software can only widen the choices available, eating into the position hitherto held by the modular systems.

The cost of computerising your accounting functions can be held down if you forswear Windows and choose DOS-compatible software. Accounting is one of the last bastions of DOS computing, with plenty of products available.

We are concerned with software which has some pretensions to business accounting. All the packages reviewed here offer the facility to record income and expenditure, and allocate them to various headings or accounts. All allow you to produce management information and statutory accounts. Most add further functionality for day-to-day operations. Most software lets you choose your own accounts headings for analysis, and some even includes typical details for broad categories of business, as well as forms of business like partnerships or limited liability. So read on to see just what is available.

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- ★★★★ Great buy
- ★★★ Good buy
- ★★ There's a better buy somewhere
- ★ Buy it and weep

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Choosing the right package

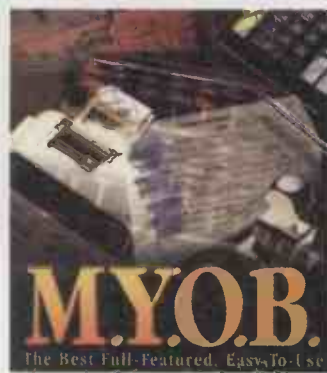
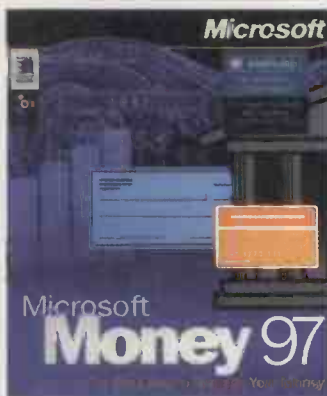
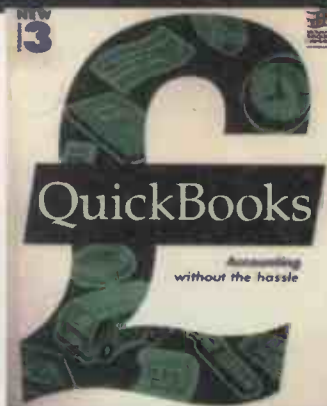
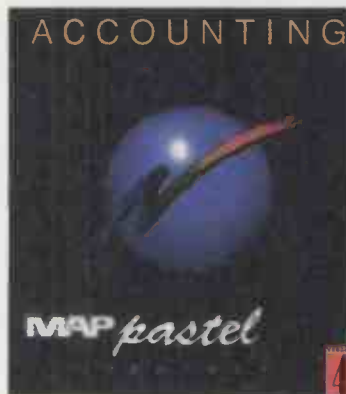
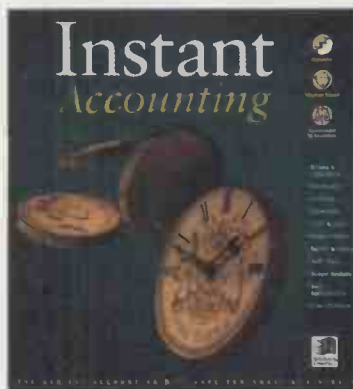
Most accounting packages will accommodate the different forms of business — sole trader, partnership or limited (corporate) company, although it's worth checking that software of foreign origin has been endorsed by UK legal and taxation specialists. The accounting software trade organisation is BASDA, which may be able to advise you.

- Ask your accountant's advice: if your accountant is an ICAEW member you might be able to benefit from special offers on software or training.
- Base your selection on ease of use and features for your business, remembering that price is not necessarily an indication of suitability. Get a demonstration disk, if available.
- Draw up as complete a specification as you can. The cost of software is nothing compared with the time it can take to set it up properly and you only want to do it once. If you only use a cashbook, don't buy a multi-module major package. On the other hand, don't reject fully-featured software if it's easy to use — you can always ignore the bits you don't need.
- Almost all programs can account for VAT, but it's worth checking if you want to operate VAT cash accounting or are involved with any of the special schemes or sales in Europe.
- Make sure the nominal ledger gives you enough different categories (like sales, travelling, or telephone) to analyse your expenditure and income in sufficient depth.
- Some software lets you carry out secondary analysis, such as allocating sales by territory or expenditure by executive. All software should provide an audit trail.
- Not all accounts software offers a stock-control function, so if you keep stock this could limit your choice. A good stock-control module will enable you to list stock items, quantities, re-order levels, prices and discounts and allow you to reserve, use, or replace stock.
- Consider whether you need sales-order or purchase-order processing — not the same

as the sales/purchase ledgers. These functions allow you to generate instructions to your works/stores or other departments or to your suppliers, linking to your ledgers and stock-control module as appropriate. Some sales-order routines will make up final assemblies, or at least picking lists, from stock components and automatically generate invoices.

- Not all businesses have the same operating priorities, which is why not all accounting programs offer the same range of features. Among some of the additional facilities variously available are:
 - Fixed asset recording/depreciation
 - Variable accounting periods
 - Retail or POS routines
 - Job costing
 - Cash-flow forecasting
 - Loan calculations
 - Budgeting
 - Bank interest checking

These functions can also be found on separate programs, which may be standalone and/or may integrate with the major accounting packages.



Glossary of accounting terms

- **Accrual VAT accounting** — The normal method of accounting for VAT whereby the VAT is due as soon as your invoice is issued, whether or not you have been paid by your customers. VAT on purchases can also be offset as soon as your suppliers' invoices arrive.
- **Aged balances** — Unpaid invoice values, grouped according to how long they have been unpaid, as an aid to chasing settlement.
- **Audit trail** — A list of all the transactions making up a set of accounts, errors included. Ideally, it should not be possible to delete or edit any entries.
- **Cash VAT accounting** — An alternative method of accounting for VAT, whereby the VAT is only paid once you have been paid by your customers. Of most use to a business

- which offers credit terms to its customers. VAT on purchases is also deferred until you pay your bills.
- **Cash flow forecast** — Predicted income, expenditure and calculated balances for a future period.
- **Corporate organisation** — A business trading as a limited company (Ltd or Plc), as opposed to a sole trader or partnership, and which exists in its own right.
- **Integrated package** — Software in which all functions are provided in one program.
- **Modular package** — Software in which different functions are provided by different "add-on" modules.
- **Nominal ledger** — Where all accounts information is stored, analysed by user-defined categories of income, expenditure,

- equity and so on.
- **Period end** — A convenient time to "close" the books in order to consolidate that period's trading figures: typically, at year-end and month-end, the latter being optional in many packages.
- **Purchase ledger** — Where expenditure is recorded, usually by supplier, then by invoice. May also be analysed by categories of goods or services.
- **Report** — A listing produced by the program detailing aspects of your business accounts, such as sales, purchases, bankings and balance sheet, usually at period end.
- **Sales ledger** — Where income is recorded, usually by client and then by invoice. May also be analysed by categories of goods or services.

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For small and growing businesses we have our Windows based Pegasus Capital family of products.



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Personal finance software

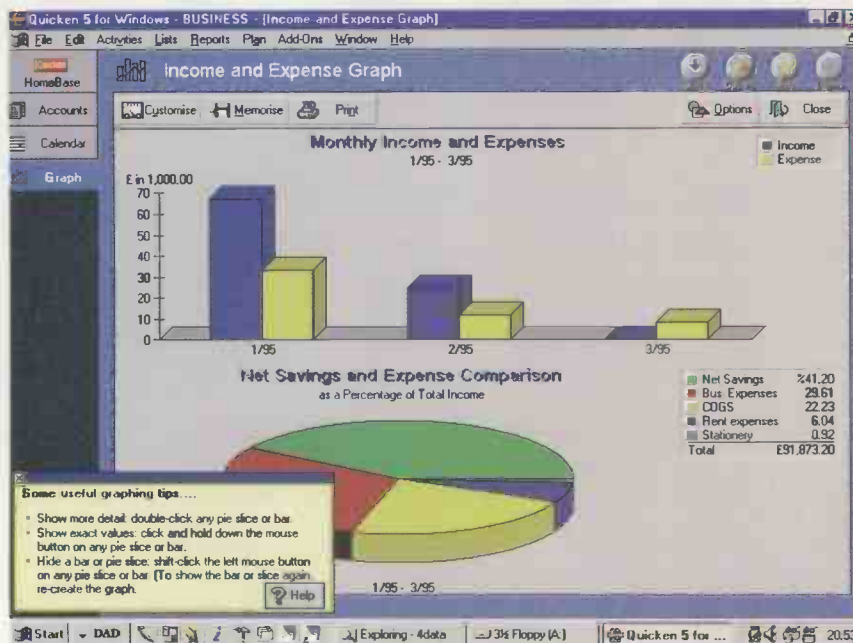
A few years ago, when people were asked what they thought they might use a PC for, a common answer was: "To reconcile my cheque book." And indeed, such was the development of consumer software then, that this was all the available software could handle. You paid out half a week's wages for a program that let you enter a date, cheque number, a very brief comment and the amount, and the computer gave you back a list to check against your bank statement.

A few years on, it's no longer half a week's wages but can nevertheless amount to a significant sum. The software still lets you reconcile your cheque book but incorporates a bit more functionality, too.

One of the principal improvements, mostly due to the Windows graphical screen, is the ease of entering information in a familiar column format (payments, deposits and balance) while simultaneously viewing previous entries for verification. Usually the "transfer" of money to both the payee and the



Above Even if you're not interested in home banking, Microsoft's new Money 97 has a lot to offer



Left Some software (this is Quicken, illustrated) is equally adaptable as either personal or simple small-business software

expense category is eased by using an on-screen representation of a cheque book. This makes keeping the data up to date less of a chore. And of course, it's only after you have built up a personal financial history that you can use the software to analyse past patterns and make any worthwhile forecasts.

The other principal advantage is the capacity to use several different accounts at once, including different forms of income. You can therefore keep track of your current, savings, deposit, credit-card, loan and building-society accounts simultaneously, with the better software being able to consolidate these and other figures like your fixed and current assets, to calculate your net worth. Current assets are things you own and can quickly convert into cash (like jewellery), while fixed assets are things you own but can't

convert quickly (such as your house).

Many of today's personal-finance programs are cut-down versions of small business-accounting software. They incorporate business features like dozens of category codes enabling you to closely analyse your expenditure. They may also have a VAT tracking facility which is useful for micro-businesses, clubs and so on, which don't need full three-ledger accounting (even though it's there, lurking under the structure). If you're just starting out as a sole trader, such an inexpensive package might be all you need initially, after which you'll know a lot more when you come to choose a bigger system.

Other facilities available include standing orders, direct debits and post-dated cheques. You can also set up budgets against which you can judge your expenditure, forecast

cashflow to see when you'll be able to afford that new Corniche, estimate your tax liability and evaluate loan proposals.

Some programs have particular features exclusive to them. Microsoft Money 97, for instance, offers online access to your bank via its Home Banking facility. At the moment, only Barclays is included and its service is only just due to be launched. Barclays' customers with Money 97 will be able to carry out assorted financial transactions from home.

Quicken has its own exclusive feature too, at least in its deluxe Home Pack version. With its home inventory you can keep detailed records of your possessions, noting down purchase prices and replacement values: useful in the event of a robbery (unless your computer is stolen), the list can be imported into the Quicken personal-accounts program as a record of your assets.

PCW Details

A selection of personal finance software

- **Money Manager Personal Edition (DOS)**
Price £39.95 (£34 ex VAT)
Contact Connect Software 0181 743 9792
- **Quicken deLuxe Home Pack (Win3.x)**
Price £69 (£58.72 ex VAT)
Contact Intuit 01932 2578501
- **MS Money 97 (Win95)**
Price £30 (£25.54 ex VAT)
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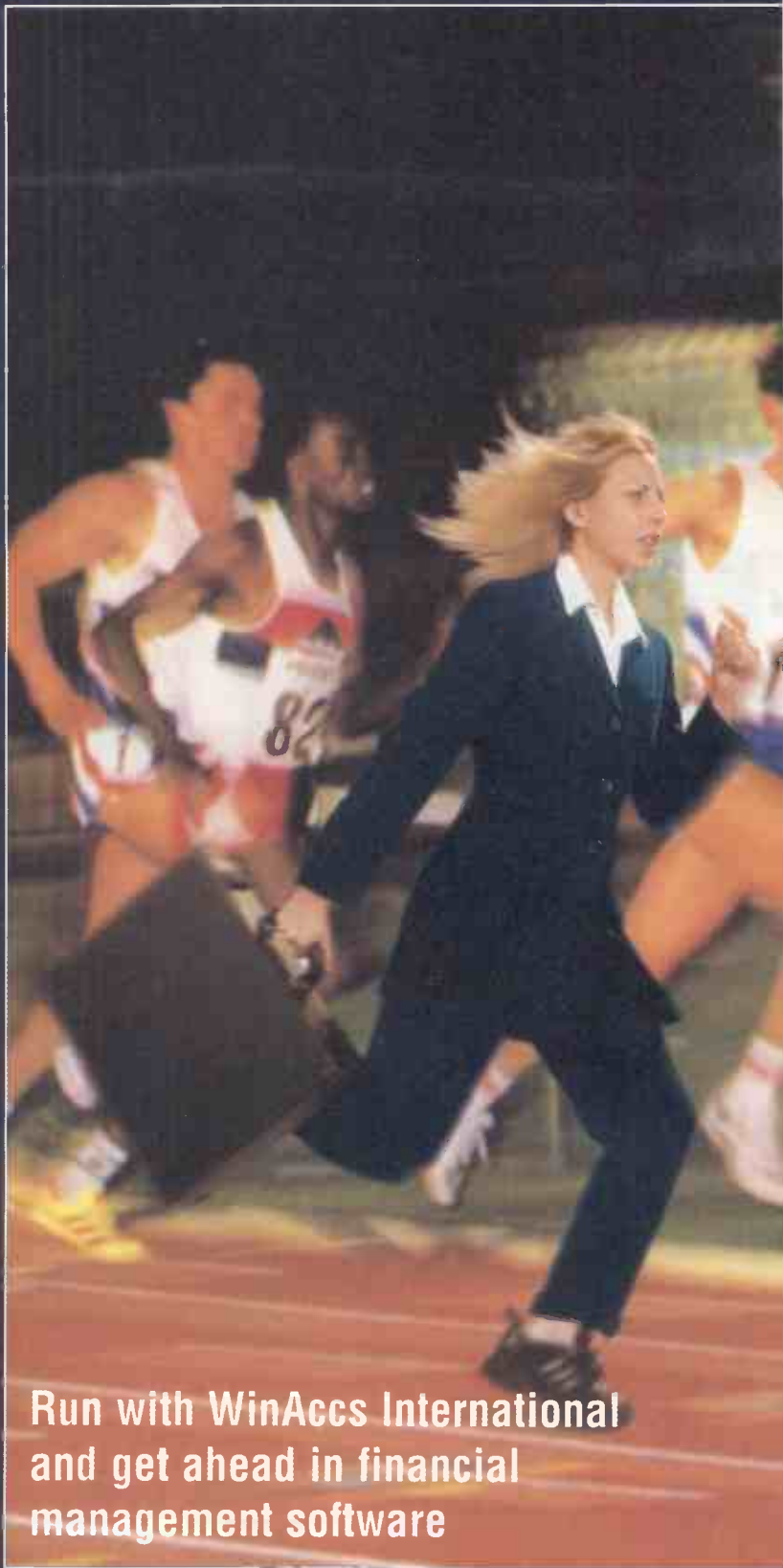
Main features include:-

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M.Y.O.B v6

This is the brand-new version 6 of M.Y.O.B. Yes, it does stand for "Mind Your Own Business" and yes, it is a silly name. The software itself, though, is very serious. It's a full three-ledger system: nominal, sales and purchase, offering integrated double-entry accounting. These three ledgers, plus stock control, a card file of addresses and your cheque-book records, form the main modules of the system. There's a "Command Centre" interface (context-sensitive hierarchical flow chart) to help you navigate, but the standard Windows menu is still there if you prefer this.

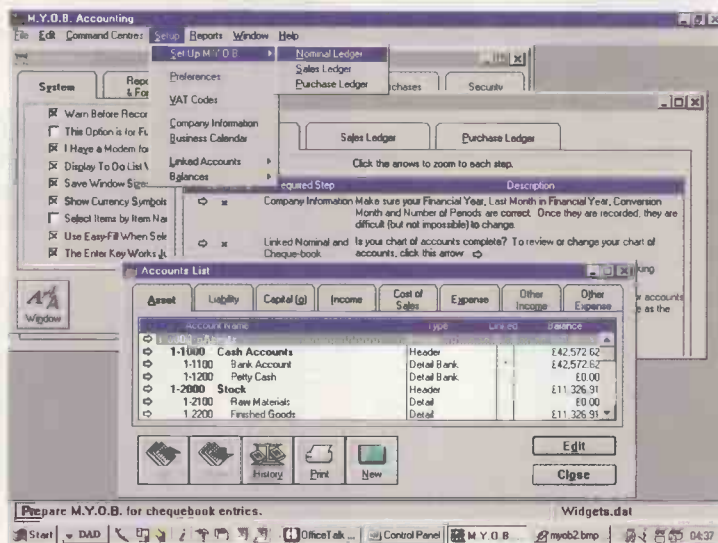
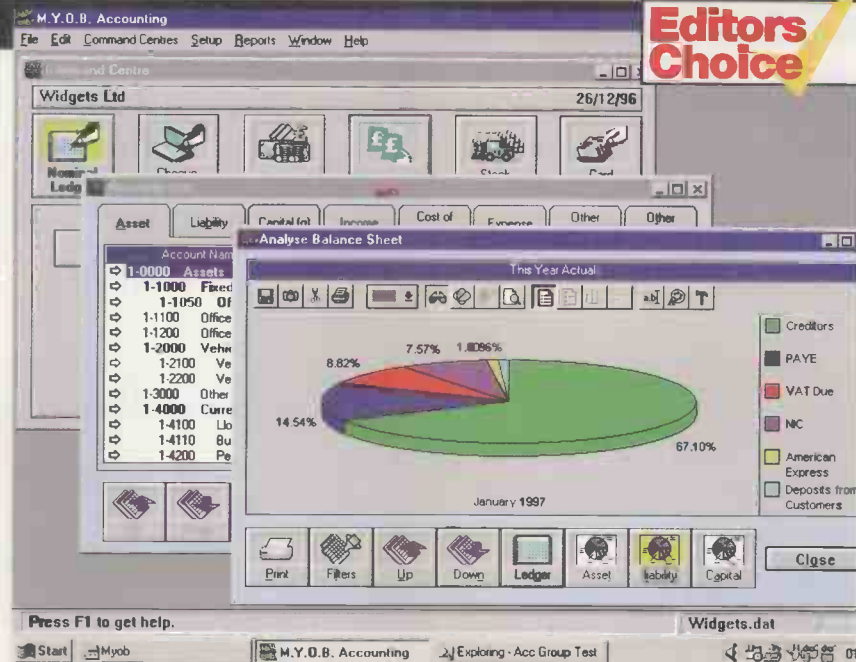
Among the enhancements to version 6 are options to customise reports: to select which fields appear on the report, to drag and drop fields into a preferred order, to add colour (displaying negative numbers in red, for instance) and to drill down to the details. There's also a new job-management facility whereby jobs can be organised under job headers and details, and include important information like start and completion dates, project manager and client contact.

Reimbursable expenses can be linked to specific jobs and even invoiced automatically.

Other additions include cue cards to hold your hand through some of the less frequent and trickier transactions like dealing with bounced cheques, importing data from Quicken and exporting data to spreadsheets and word processors.

Otherwise, it's business as usual. The nominal ledger offers eight types of account: asset, liability, capital (or equity), income, expense, cost of sales, other income and other expense — that should be sufficient. There are also up to four levels of account nesting, each level linked to the one above, giving you plenty of categories with which to closely analyse your figures. Help in choosing your initial list of accounts is facilitated by about a hundred pre-defined sets, ranging from freelance writers to funeral directors, from computer dealers to cobblers (or should that be cobblers to computer dealers?) or you can define your own. It also knows about VAT cash accounting. Updating is instantaneous and compulsory, so if you need to operate batch posting, this is not for you.

The sales ledger lets you assign both default and customer-specific credit terms, and you can, if you so choose, calculate and impose finance charges on overdue accounts. As well as invoices and credit notes there are "pending" or pro-forma invoices, the issue of which has no effect on ledgers or stock and so can be used as quotations or



Above There's more than one way to view MYOB's data, including drill-down

Left MYOB can be extensively customised to suit your way of working

for anything from credit control to sales prospecting. You can make notes of your conversations and set a follow-up date.

Should you make a mistake entering data, you can rectify it seamlessly as long as it hasn't yet been saved, but if it has there's a routine for that, too. It is easy to access detailed information using drill-down techniques, right back to the original entry if necessary.

M.Y.O.B comes with a full complement of reports (about 100), which include customer/transaction histories allowing you to analyse and list everything you need to know about your business. Reports, together with invoices and their derivatives, statements, purchase orders and cheques, can be customised for fonts, fields and layout. This is particularly useful if you elect to print on plain paper or on your own letterhead. Instead of the pre-printed M.Y.O.B forms.

acknowledgements. As well as opening individual customer accounts, you can establish any number of jobs for each customer, each job's income and expenditure being separately tracked.

Purchase orders can be formatted for goods, services or "professional" layout. Stock control is handled automatically, stock levels (and values) being reduced as you invoice sales and increased as you send out purchase orders. And you can adjust stock manually to accommodate those inevitable stock-taking discrepancies. All stock can be individually priced (at cost or selling price), although you can override those figures for individual transactions. Stock items can be grouped together to allow automatic parts assembly.

M.Y.O.B incorporates a record card file for customers and suppliers which, together with its To-Do List, gives you simple contact management albeit at a level of sophistication equal to that of a real card index. You can assign up to ten single-letter identifiers to a card, enabling you to categorise your contacts

PCW Details

Price £229 (£194.89 ex VAT)
Contact BestWare UK 01752 201901
Good Points Childishly easy to use without forfeiting sophistication.
Bad Points Nothing obvious.
Conclusion A big-business accounting system at a small-business price.
 ★★★★★

Pegasus Capital

Pegasus is one of the UK's major publishers of accounting software, perhaps better-known for its corporate-level modular systems. In Capital, it looks as if the company may have introduced its own competitor for the lower reaches of that market. Capital is not as well-specified as, say, Senlor, but it does pack a lot of the average modular package's essential functionality into a relatively inexpensive, integrated system.

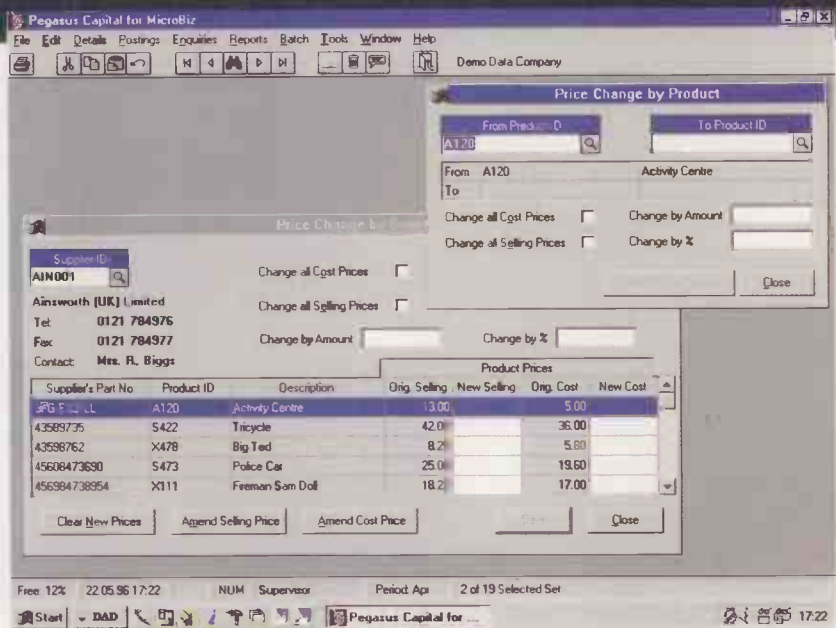
Running under Windows, Capital offers the usual sales, purchase, and nominal ledgers, cash book and invoicing, and there is stock control together with sales-order and purchase-order processing. Capital makes claims to no particular small-business niche, being configurable for product and/or service businesses, and it accommodates sole traders through partnerships to limited companies. In response to customers' demands, the sales ledger in the latest version now supports up to £9,999,999.99 on a single paying-in slip and bank reconciliation handles £99,999,999.99

(we should be so lucky!). The package can also offer a choice between 12 or 13 accounting periods in a year.

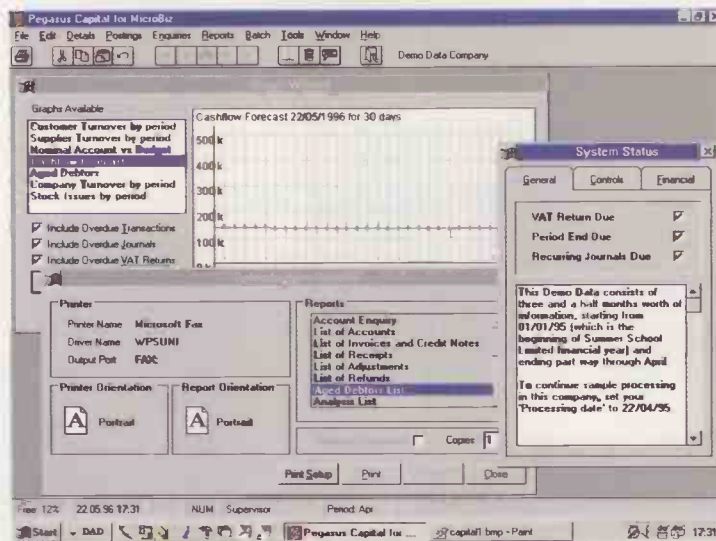
A Set-up Wizard helps you create an appropriate set of accounts for your particular circumstances, which you can modify, including nominal accounts and analysis codes. Day-to-day transaction facilities include postings for invoices, credit notes, receipts and payments. Files are

updated as soon as postings are made so enquiries, which include routines to view account balances, stock levels and other business information, always show the up-to-date situation. Batch processes take care of such periodic functions as automatic purchase payments, while items like standing orders and direct debits are looked after by a recurring journal update function.

One of Capital's less usual (in this price range) but more welcome features is sales-order processing. This facility, which stores and processes details of sales and purchase orders from reception to despatch and invoicing (however long that may take) is particularly useful to contracting, manufacturing and similar organisations whose projects may run for a long time and involve considerable mass. Most of the information needed can be entered from your customer's order, and if it is a previous customer, Capital will add information from the customer-account record, including credit limit and current balance. It also automatically



Above All Capital's operating records are easily changed to reflect new conditions



Left Capital's on-screen information includes the Status display which gives you a picture of your business balances, at a glance

allocates the next sales-order number, notes the date on which the goods are due to be delivered, and remembers any settlement discount already agreed as well as any overall discount to be applied to the whole, and the carriage details. You receive a stern warning if you try to release sales orders when the relevant customer account is on hold, over its credit limit or about to exceed it.

When you come to total the items ordered, the program retrieves all the relevant product information including stock levels, description, price and customer line discount. The order totals already include any carriage charge which has been entered. The program checks stock levels and advises you if they drop below critical levels. Printing an invoice automatically updates the ledgers with the invoice details, including the customer's account and the relevant accounts in the nominal ledger.

Reporting facilities include options to print and view reports and to export information to spreadsheets or word processors. Cashflow forecasts, aged debt, customer, supplier and

product turnover can be illustrated by one of the built-in graphs and exported to your word processor. Plus, there is a VAT Return option to calculate and print your VAT100 form.

Pegasus runs its own software and book-keeping training courses at various UK regional centres, or you can buy training from authorised, independent Pegasus trainers. Service Cover provides you with telephone support direct from Pegasus and your first 90 days are free.

There's a lot in Capital for small- to medium-sized businesses with manufacturing or contracting interests. When things get too cramped, there's an easy upgrade path to the (DOS) Opera software by the same publisher.

PCW Details

Price £646 (£549.78 ex VAT)

Contact Pegasus Software 01536 495200

Good Points Almost everything the average small business needs in accounting functions.

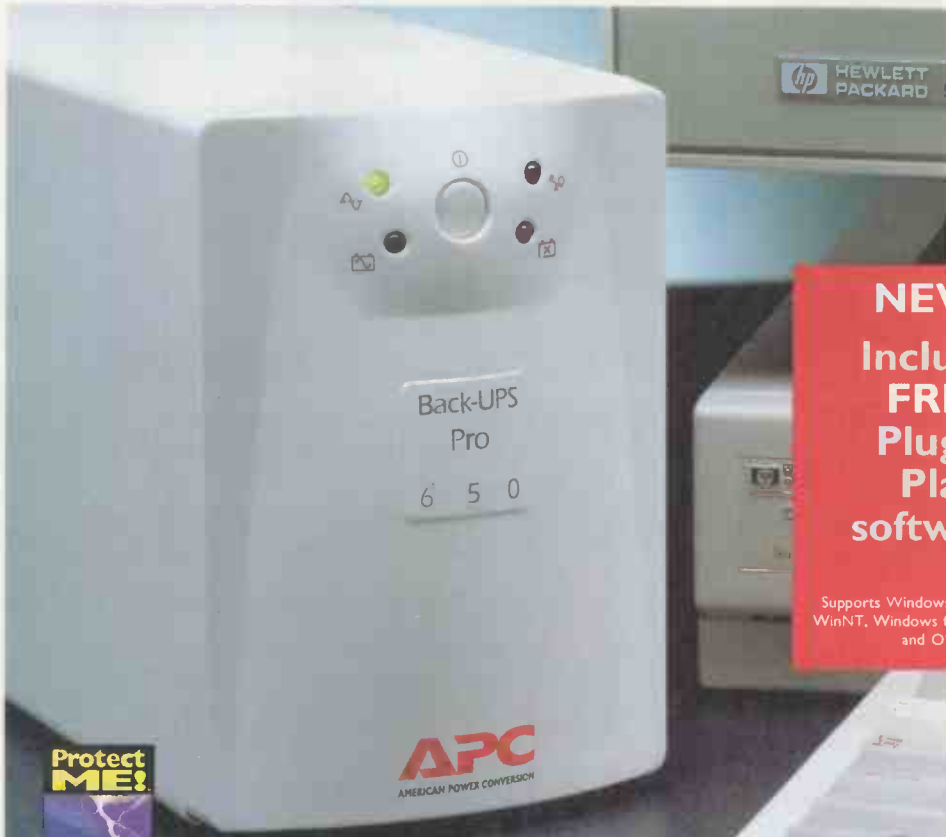
Bad Points You need a basic grasp of accounting first.

Conclusion A versatile accounting suite, particularly cost-effective for those who need sales-order processing.

★★★★

IT'S NOT IF, IT'S WHEN

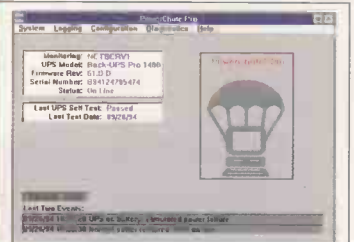
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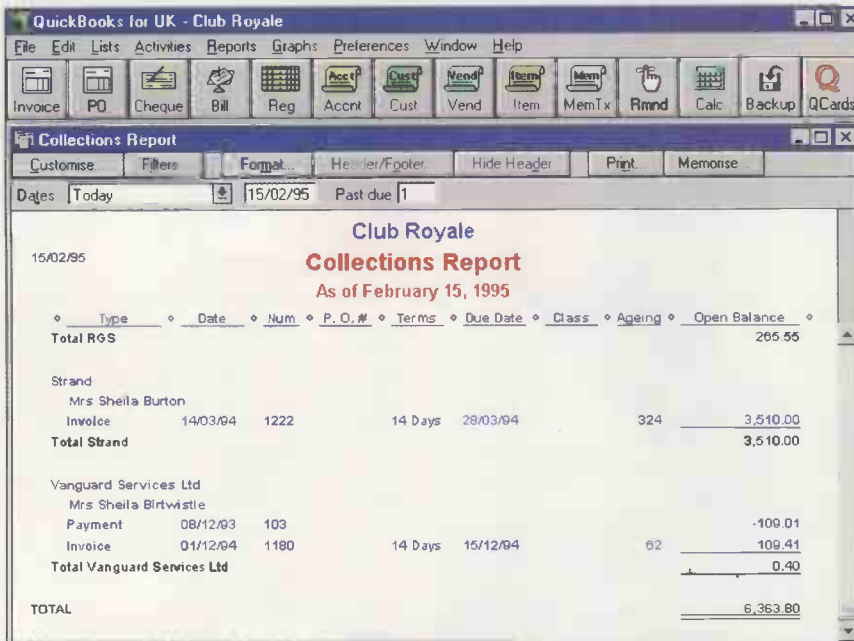
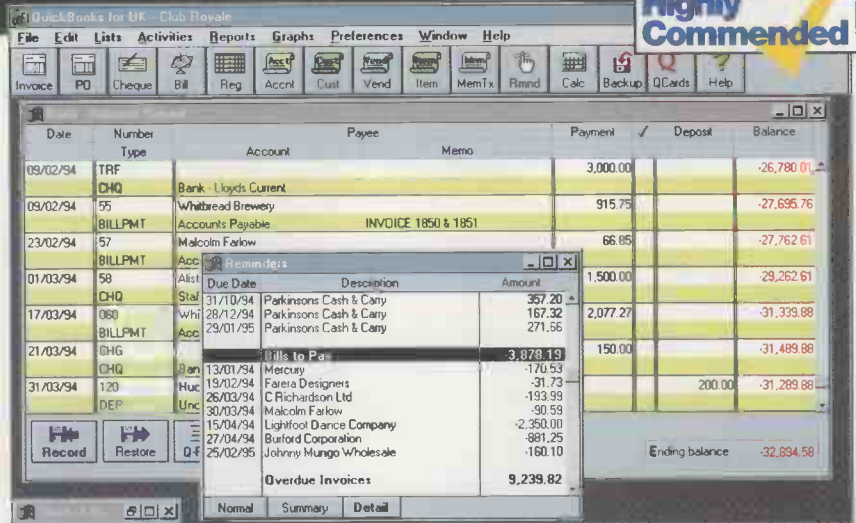
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Personal Computer World
Highly Commended

QuickBooks v3

The best-selling QuickBooks is a basic three-ledger double-entry accounting system, although it's deliberately designed so non-accountants won't know that. It avoids those terms, as it does words like debit and credit. The sales ledger becomes "accounts receivable", the purchase ledger becomes "accounts payable". This will suit those who are not, and don't particularly want to be, accountants. Money to be paid out is entered on an on-screen representation of a cheque (as is cash paid out which, initially, can be confusing). Invoice details are entered into fields laid out as the paper form.

Invoices and purchase orders can make use of goods or service item descriptions predefined by you, and include all the necessary VAT categories and analysis codes. All the



Above The QuickBooks Register and Reminder keep you up-to-date with your finances

Left The QuickBooks Collection Report helps you chase your debtors

usual nominal analysis codes are possible: on setup you can choose from over 20 predefined sets, depending on the type of business you run. You can, of course, add and amend. Invoices may not only be issued to particular clients in the usual way, but also against specific jobs for that client. Three different invoice layouts (professional, service and goods) let you add, drop or rename fields until the information on the form is exactly what you want. You can do the same thing with cash-sale receipts, credit memo forms and purchase orders.

When invoices haven't been paid by the due date, you can add finance charges, choosing your own percentage interest rate or charging a fixed sum. Although everyone says they want this facility to penalise late payers, few seem to use it when they've got it.

Your "cashbook", which includes income and expenditure, both in total and analysed, is listed in QuickBooks' Registers, which is searchable by date and amount. It can also be interrogated using drill-down and can be directly edited. You get a separate register for

each bank/cash account, which shows your balance too. Additionally, there is a separate Reminder window which can be set to appear on startup, showing your bills and invoices due.

Payments, in and out, in settlement of outstanding bills or invoices can be applied to specific outstanding amounts. As well as settling bills in this way, you can also record other cash and cheque payments, either against the cheque number or a voucher reference. After incoming payments have been allocated to particular invoices, you can record your banking deposit against your paying-in slip number, so everything is easily traceable.

QuickBooks includes an integrated stock-control and stock-reporting facility which, when active, gives you a "stock part" item category which you can increase by making purchases and decrease by making sales. There is no "parts explosion" facility but you have the option to turn stock control off, when it reverts to being an equally useful Invoice Item which can be applied to service invoices.

Another optional feature is the audit trail

which is implemented so that the original entry and any subsequent changes appear on the list together. You do not have to use it if you don't want to, but if you do it is password protected against disablement.

Monthly accounting and management information reports are predefined but you get a wide variety of options. Sales report, for instance, can be listed by item, by customer or by sales area or representative. Management reports include cashflow forecast, project or job reports and missing cheques, as well as the usual profit and loss, balance sheet and trial balance. Certain reports can be converted into graphs (which can be printed out) for a better appreciation of your finances.

You might find the monthly Collections report useful in that it analyses your invoices by their (variable) settlement periods to produce a list of what you can expect to receive and when, so you can phone your customers to find out why you haven't had it yet.

Together with its personal finance stablemate, Quicken, QuickBooks may fairly be said to have considerably influenced the market for "non-accountant" accounting software and it remains one of the best implementations of that philosophy. What's more, its price makes it doubly worth investigating.

PCW Details

Price £146 (£124.25 ex VAT)

Contact Intuit 01932 578501

Good Points Extremely easy to use, with all the basic features.

Bad Points Probably won't suit an accountant.

Conclusion QuickBooks is a competent business tool which should be perfectly satisfactory for most small-business/sole-trader users.

★★★★

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The new EPSON STYLUS COLOR 800. 1440dpi. 7ppm colour.

Live life in the fast lane with the new EPSON Stylus Color 800. Epson's unique PerfectPicture Imaging System™ takes PhotoReal colour supersonic! But if speed doesn't thrill you, how about this? The EPSON Stylus Color 800 breaks the quality barrier with 1440dpi resolution and Super MicroDot – and with an EPSON, you won't need additional options for best results. Hold onto your seats because you

also get Windows®/Mac compatibility, AcuPhoto halftoning, Super MicroWeave, Quick-Dry Inks, and optional PostScript and network capability.

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EPSON®

Sage Instant Accounting

A careful mixture of old and new accounting practices, Sage's entry-level business-accounting software for Windows, Instant Accounting, retains some of the traditional accounting controls including an authoritative audit trail. Despite this, it makes useful concessions to non-accountants who are computerising their business for the first time and who probably make up its main market, by allowing easy, if limited, correction of mistakes (including the reversal of mis-postings) without resorting to double-entry ledger transfers.

Immediate updating of bank and other account balances is possible, but for companies where accounts are maintained by clerical staff who prefer to prepare invoices, credit notes and statements in batches (for later checking by senior personnel), this option is available too. Invoices generated by the system can be product or service-based, the latter accepting free text. Invoices produced manually, and already sent to your customers, can be logged at any time. Actually, you can periodically "clear down" Instant Accounting's audit trail, too, removing completed transactions (preferably having first taken a copy for your accountant).

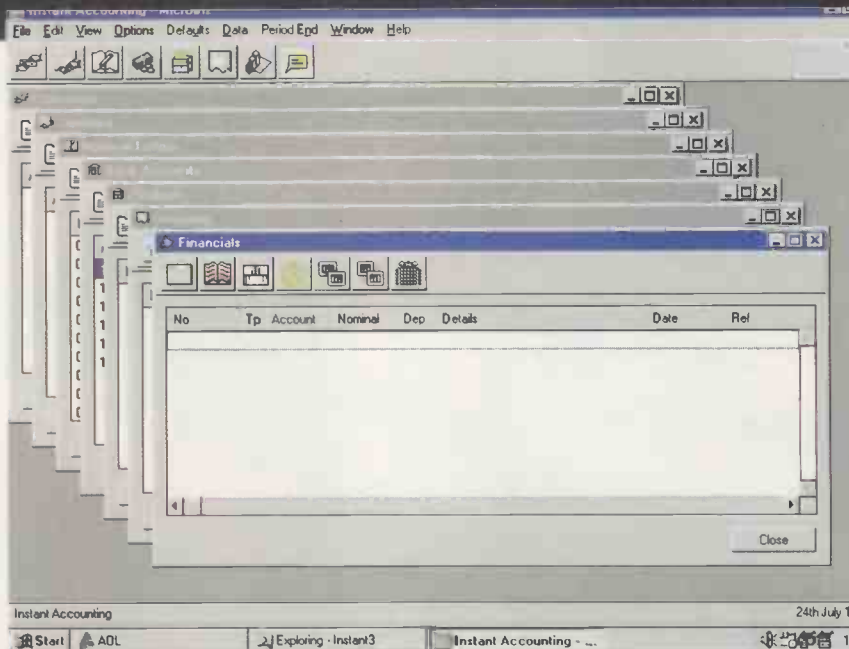
The essential features on offer include sales and purchase transaction recording: cash and credit-trading facilities (including credit cards), cash and accrual VAT accounting, and financial and management reports. There is no stock control but you are unlikely to attempt to run a complex manufacturing operation on an £84 package. You can maintain a descriptive list of products, including pricing. This is then presented, during invoicing, as a drop-down list from which you can make your selection, knowing that the details will be accurate.

These days, a drill-down traceability facility is practically mandatory and Instant Accounting has one. You can analyse a transaction into the individual items that comprise it by double-clicking on a line of the report. This covers transaction activity reports for customers, suppliers, nominal or control accounts.

Equally useful, if you are not an accountant, are Instant's wizards which hold your hand through awkward, if little-used, procedures like transferring money from one bank, cash or credit-card account to another.

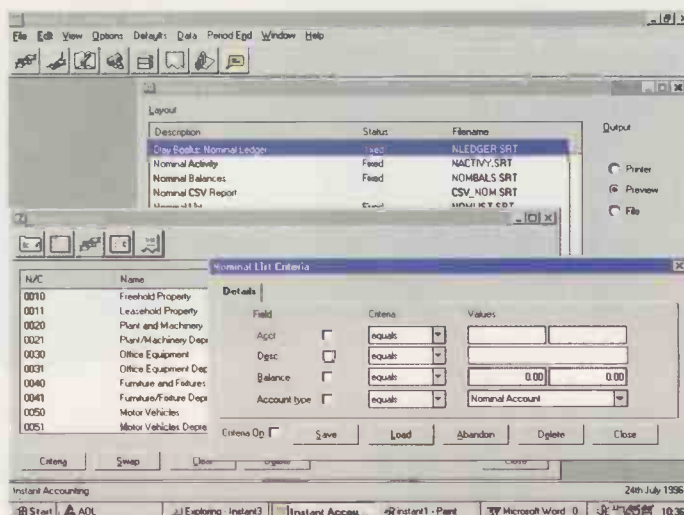
As with all Sage's products you get impressively versatile document-customising facilities, allowing you to produce invoices and reports on your own pre-printed forms, plain paper (laid out however you wish) or Sage-supplied stationery. Reporting content can be quite extensively customised for a product in this price range. You can decide which periods will be used in reports (either calendar months or the number of days), include transactions dated after the report date and automatically group consecutive transactions of the same type on your statements (for instance, those that share the same date or reference).

Transactions themselves can be assigned to up to 999 different departments and you



Above Instant Accounting's interface is easy enough to use

Right Viewing and analysing your data can be carried out using your own selection criteria



get 999 different product categories for analysis purposes. You can also select report data using criteria you define yourself for such matters of interest as customers, suppliers, nominal accounts, product records and invoices. You can set up and save frequently-applied criteria for re-use. Instant Accounting will also write "begging letters" to your customers, asking to be paid, and you can mailmerge any fields in your records.

Data entry is aided by vivid representation of actual forms on-screen (an effect pioneered by Sage, but nowadays everybody is doing it), so, for example, payments are recorded on a representation of a cheque. The VAT calculation, too, is presented on a realistic-looking replica. Such familiar metaphors certainly make it easier for the novice.

Instant Accounting is one of the few packages to be certified by the Institute of Chartered Accountants in England and Wales. It also qualifies for free initial telephone support from Sage: on the box it states 30 days but we have been told 90 days.

When you are ready to upgrade, the recommended Sage upgrade path is to its own Sterling package which incorporates extra facilities such as stock control and order processing. And you may like to know that Instant Accounting shares its menu format and icons with Sterling for Windows.

PCW Details

Price £99 (£84.25 ex VAT)

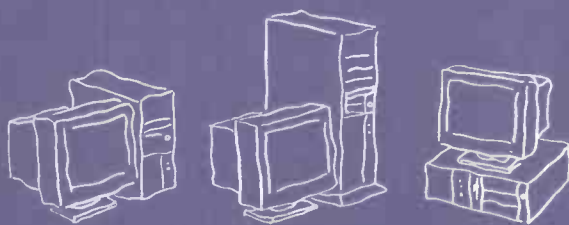
Contact Sage Group 0191 255 3000

Good Points User-friendly interface. Versatile printed document layouts.

Bad Points No stock control, so not really suitable for manufacturing or distribution operations.

Conclusion Sage's baby business book-keeper makes a useful starting point for service-orientated businesses.

★★★



MJN

Whatever you want - MJN have the answer

"MJN is one of the best value systems on the market today"

PC Advisor



Quality Is The Key To Our Success

Quality is the driving force within MJN. We use the highest quality components available and all new PC systems are designed to comply with CE safety and emission standards. MJN service, support and systems are all certified to the ISO 9002 quality standard.



Certificate No. FS 28122
BS EN ISO 9002:1994

Choice Of Expandable Case Styles

MJN systems feature a choice of ergonomically designed cases with small footprints and massive expansion potential. These include a seven bay desktop, seven bay midi tower and nine bay full tower with heavy duty CE approved power supplies.

Backed By Superb Service And Support

Our highly qualified, knowledgeable sales staff can provide you with the advice on your specific requirements and recommend the solution that fulfils your individual needs. They are backed by teams of trained support staff to quickly resolve any problems should they occur.

Extensive Range Of Software Options

The superb Lotus software suite (Lotus SmartSuite 96 for Windows 95) comes as standard with many of the systems. The software is pre-loaded ready for use with on-line documentation. We also provide a fabulous range of bundled multimedia titles with Multimedia systems.



MJN P150 and P166+ systems are available in an ergonomic seven bay desktop (P150) or midi-tower (P166+) case.

All systems feature latest Intel® Pentium® processor based motherboards with upgradeability to Intel 200MHz Pentium MMX™ processor, ultra fast 64-bit PCI graphics, large enhanced IDE hard disks, fast eight speed CD-ROM drives with 16-bit sound and Lotus SmartSuite 96 together with other programs

Multimedia (MM) systems also include superb multimedia titles such as Infopedia multimedia encyclopaedia and BodyWorks together with stereo speakers and PC joystick.

Our best buy P166+ multimedia system comes with an incredible 32Mb EDO RAM, 33.6 modem, large 15" screen and full-feature eight speed multimedia at just £999+VAT (=£1173.83 inc VAT).



MJN P150MM desktop

- Intel 150MHz Pentium® processor
- Upgradeable to Intel P200 MMX™ processor
- Plug & play motherboard with Intel socket 7
- 16Mb EDO RAM, (max 128Mb)
- 2.1Gb enhanced IDE hard disk
- 33.6 Internal BABT fax/data modem
- 256k Pipeline burst mode cache
- Eight speed IDE CD-ROM drive
- Integrated 16-bit stereo sound, PC joystick and 4w speakers
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- High performance 64-bit graphics accelerator on board with video acceleration (uses 1Mb of system RAM)
- Software MPEG capability allowing playback of MPEG videos
- 14" crisp sharp 0.28dp NI SVGA screen
- 105 Windows® 95 keyboard and mouse
- Expandable desktop case with 7 drive bays

Software

- Microsoft® Windows 95 with CD & manual
- Lotus SmartSuite 96 for Windows® 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD multimedia titles

£1056.33 inc. VAT

£899 +VAT

MJN P150 MM Best Buy desktop

with 15" screen

£1115.08 inc. VAT

£949 +VAT

MJN P166+ MM Midi Tower

- 6x86 P166+ processor (IBM/Cyrix)
- Upgradeable to Intel P200 MMX™ processor
- Plug & play motherboard with Intel socket 7
- 32Mb EDO RAM (max 128Mb)
- 33.6 Internal BABT fax/data modem
- 2.1Gb enhanced IDE hard disk
- 256k Pipeline burst mode cache
- Eight speed IDE CD-ROM drive
- Integrated 16-bit stereo sound, PC joystick and twin 15w stereo speakers
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- High performance 64-bit graphics accelerator on board with video acceleration (uses 1Mb of system RAM)
- Software MPEG capability allowing playback of MPEG videos
- 15" crisp sharp 0.28dp NI SVGA screen
- 105 Windows 95 keyboard and mouse
- Expandable midi tower case with 7 drive bays (shown over the page)

Software

- Microsoft Windows 95 with CD & manual
- Lotus SmartSuite 96 for Windows 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD multimedia titles

£1173.83 inc. VAT

£999 +VAT

CD Software Titles

included with all models

- Infopedia UK
- Multipedia Bookshelf
- Comptons Interactive World Atlas 97
- BodyWorks v5.0
- Project Manager Pro
- KeyCAD PRO 2.0
- Gizmos and Gadgets
- Read, Write and Type
- Labels Unlimited
- Comptons 1997 Encyclopedia

Other Options

Please call for details

Quickshot PC microphone, MJN mouse mat, MJN total cover 3 year warranty, Lotus back-up CD

Printers

HP DeskJet Mono, HP DeskJet Colour, Epson Stylus Color 200, Epson Stylus Color 500, Facit Laser Printer

Both VAT inclusive and VAT exclusive prices shown.



Telephone

MJN 01 282 777 555

Sales Lines Are Open Mon-Fri 9-7pm Sat 9-5pm

MJN Technology Ltd, Granville House, Blackburn Rd, Simonstone, Burnley, Lancs, BB12 7GT.

Tel. 01 282 777 555, Fax 01 282 77 08 44. All prices exclude delivery (£25+VAT=£29.38) for UK mainland excluding Scottish highlands. Prices shown with and without VAT at 17.5%. Software applications are provided on CD or pre-loaded with on-line documentation. Screen sizes shown are CRT sizes as per industry practice. Pack shots shown for purposes of illustration only. Goods are normally despatched within 10 to 14 days. All orders will be fulfilled within 28 days unless otherwise notified. Specifications, prices and availability are subject to change without notice. Products sold subject to our conditions of sale copies of which are available on request. The peripherals and upgrades listed are sold only with the purchase of an MJN system. Intel Inside and Pentium logos are registered trademarks of Intel Corporation. E&OE.

"A Fast Well Equipped PC - A Great Choice For Experts and Beginners alike"

Computer Buyer



A Quality Range Designed By You

Extensive research into our customer requirements highlighted the most important features they would like to see within their PC systems. These included more choice, higher performance, quality components and easy upgradeability - all of which we incorporated at the most competitive prices and with the highest quality of service and support.

Optimised For Windows 95

All Windows 95 systems feature 16Mb or 32Mb EDO RAM and are built utilising components which are optimised for the smooth and rapid operation of Windows 95.

Future-Proof Upgradeability

All MJN systems can be upgraded to Intel Pentium 200MHz processor. Our systems are also designed to ensure easy upgradeability of RAM, graphics and storage devices.



Highest Performance Components

The motherboards, graphics adaptors and hard disks used in these systems are amongst the highest performance components available. Our high performance systems feature the latest Intel 430HX chipset with 512k burst mode cache, EDO RAM and fast 64-bit PCI graphics cards with synchronous 'SDRAM' or 'SGRAM'. Many of our most popular models feature the latest Intel shared memory bus architecture which allows powerful 64-bit on-board graphics accelerator to use 1Mb of fast 64-bit main RAM as graphic memory. This can be increased to 2Mb to give higher resolution / more colours, using the software setup at no extra cost - particularly useful with 16Mb systems.

The Best Value in the UK

MJN's manufacturing strength, direct relationship with the world's leading component manufacturers and direct supply to customers without dealer outlets enables us to offer the highest quality systems at unbeatable prices.

MJN high performance Midi-tower systems are available in two best selling configurations.

The popular P166MX model includes 32Mb EDO RAM, 256k pipeline burst cache, large 15" screen, 2.1Gb hard disk, 33.6 modem and full-feature eight speed CD multimedia at £1149 +VAT (£1350.08 Inc. VAT).

Our new high performance P200+ model features one of the fastest processors available, the IBM/Cyrix/ST 6x86 P200+ and is simply unbeatable in terms of performance, specification and price.

It comes with a massive 32Mb EDO RAM for smooth multi-tasking, ATI 3D 4Mb SGRAM graphics, 3.2Gb fast EIDE hard disk, 12 speed CD-ROM, 33.6 V34 modem and crisp sharp 15" NI screen. All this at a sensational £1299 +VAT (£1526.33 Inc. VAT)

Both systems come with Lotus SmartSuite 96 and a range of other programs and CD multimedia titles as listed below.

Both systems are upgradeable to Intel 200MHz Pentium processor with MMX™ technology.



MJN P166MX MM midi tower

- Intel 166MHz Pentium® processor with MMX technology
- Upgradeable to Intel P200 MMX™ processor
- Plug and play motherboard with Intel socket 7
- 32Mb EDO RAM (max 128Mb)
- 256k Pipeline burst mode cache
- 2.1Gb enhanced IDE hard disk
- Eight speed IDE CD-ROM drive
- 33.6 Internal BAPT fax/data modem
- Integrated 16-bit stereo sound
- Twin 15w stereo speaker system
- Quickshot joystick
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- High performance 64-bit graphics accelerator on board with video acceleration (uses 1Mb RAM)
- Software MPEG capability allowing playback of MPEG-1 videos
- 15" crisp sharp 0.28dp NI SVGA screen
- 105 Windows® 95 keyboard and mouse
- Expandable midi tower case with 7 drive bays

Software

- Microsoft® Windows 95 with CD & manual
- Lotus SmartSuite 96 for Windows 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD multimedia titles

MJN P200+ MM midi tower

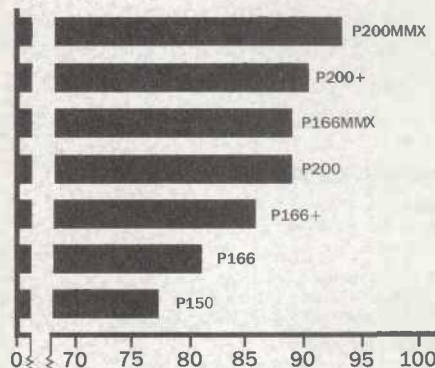
- IBM/Cyrix/ST 6x86 P200+ processor
- Upgradeable to Intel P200 MMX™ processor
- Plug and play motherboard with Intel socket 7
- 32Mb EDO RAM (max 128Mb)
- 512k Pipeline burst mode cache
- 3.2Gb enhanced IDE hard disk
- Twelve speed IDE CD-ROM drive
- 33.6 Internal BAPT fax/data modem
- Soundblaster 32 hardware wavetable stereo sound
- Twin 15w stereo speaker system
- Quickshot joystick
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- ATI Rage II 3D graphics card with 4Mb SGRAM
- Software MPEG capability allowing playback of MPEG-1 videos
- 15" crisp sharp 0.28dp NI SVGA screen
- 105 Windows® 95 keyboard and mouse
- Expandable midi tower case with 7 drive bays

Software

- Microsoft Windows 95 with CD & manual
- Lotus SmartSuite 96 for Windows 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD Multimedia titles

Processing Power

Models are available with Intel Pentium® or the higher performance IBM/Cyrix/ST 6x86 processors. Relative performance of the processors is shown by Ziff-Davis Winstone 96 benchmarks. For entry level we recommend P150 systems. For general home and business use we recommend the more powerful P166+ or P166MMX systems. For Power users we recommend P200+ or P200MMX systems. In general systems with faster processors are also well specified usually featuring more RAM, faster modem and larger screens. All the systems featured include Intel socket 7 and are upgradeable to Intel Pentium 200 with MMX™ technology processors. Pentium Pro systems are not recommended unless you are running Windows NT as these may be actually slower than Pentium systems when running typical Windows 95 programs. Relative processor performance based on Ziff Davis Winstone 96™ as certified by MDR labs.



MJN Business Solution Rental is available to business users, subject to status, who have traded for 3 years or more. All rental figures are given ex VAT, and are collected quarterly over a 3 year term. Full details of finance facilities are given on order. Terms and conditions will be sent to you before you sign.

All the MJN multimedia systems come with the best CD multimedia titles and Lotus SmartSuite 96 software. Software is pre-loaded or on CDs. Pack shots are shown for illustration only.



£1350.08
inc. VAT

£1149
+VAT

£1526.33
inc. VAT

£1299
+VAT

Telephone

MJN 01 282 777 555

Sales Lines Are Open Mon-Fri 9-7pm Sat 9-5pm

MJN Technology Ltd, Granville House, Blackburn Rd, Simonstone, Burnley, Lancs, BB12 7GT.

Tel. 01 282 777 555. Fax 01 282 77 08 44. All prices exclude delivery (£25+VAT=£29.38) for UK mainland excluding Scottish highlands. Prices shown with and without VAT at 17.5%. Software applications are provided on CD or pre-loaded with on-line documentation. Screen sizes shown are CRT sizes as per industry practice. Pack shots shown for purposes of illustration only. Goods are normally despatched within 10 to 14 days. All orders will be fulfilled within 28 days unless otherwise notified. Specifications, prices and availability are subject to change without notice. Products sold subject to our conditions of sale copies of which are available on request. The peripherals and upgrades listed are sold only with the purchase of an MJN system. Intel Inside and Pentium logos are registered trademarks of Intel Corporation. E&OE.

"MJN Produced The Fastest Performing Machine"

PC LAN

MJN multimedia performance systems come in truly expandable 7 bay midi tower or 9 bay full tower cases.

Our P200+ midi tower model is the ultimate in terms of performance, specification and price. It comes with the latest Intel 430HX chipset with 512K pipeline burst cache, a massive 32Mb EDO RAM for smooth multi-tasking, 3.2Gb fast EIDE hard disk, twelve speed CD-ROM, 33.6 modem superb Soundblaster wavetable sound card and crisp sharp 17" NI screen. This system also includes ATI Rage II 3D 4Mb SGRAM based graphics card with sparkling Windows 95 performance and is available at £1499 +VAT (£1761.33 Inc. VAT)

The P200MX includes 64Mb RAM and 15" screen at just £1599 +VAT (£1878.83 Inc. VAT) or with a 17" screen for just £1799+ VAT (£2113.83 inc. VAT). Both systems come pre-loaded with Lotus SmartSuite 96 and a range of other programs and CD multimedia titles as listed below.



"you can put the exceptional performance down to the fact that the machine uses good quality brand-name components"

What Personal Computer

Buy MJN with confidence

Fast processors

All systems use fast Intel Pentium® processors or 6x86 processor manufactured by IBM/Cyrix/ST.

Advanced motherboards

Latest plug & play motherboards with Intel socket 7 for future upgradeability to 200MHz Pentium with MMX™ technology.

Advanced 64-bit graphics

Many of our systems feature advanced 64-bit accelerator graphics on board with fast windows acceleration and video acceleration. The 64-bit graphics use 1Mb of system RAM and can be BIOS selected to use 2Mb RAM in 16Mb systems. Our top of the range systems feature ATI 4Mb 'SGRAM' graphics with 3D.

32Mb RAM and burst mode cache

All our multimedia systems now include at least 16Mb EDO RAM with most featuring 32Mb This together with fast pipeline burst mode cache gives superb performance when running Windows 95. Windows 95 runs slowly on all 8Mb systems. P200MMX systems have 64Mb as standard.

Fast CD-ROM drives & modems

Fast eight speed or twelve speed CD-ROM drives with top quality sound cards are now standard in all systems. All of our systems now also include fast 33.6 fax/data/Internet modems.

Top quality business software

Lotus SmartSuite 96 for Windows 95 is the latest and best version of this superb software suite that includes everything you are likely to need for business use. We also include top quality educational and leisure software.

Personal Finance

All systems are available on Personal Finance APR 19.8%. Please call for details. Be sure you can afford the payments before entering into a credit agreement.

6MJNFT7B

All the MJN multimedia systems come with the best CD multimedia titles and Lotus business software including SmartSuite 96. Software is pre-loaded or on CD. pack shots are shown for illustration only.



MJN P200+ MM midi tower 17"

- IBM/Cyrix 6x86 P200+ processor
- Upgradeable to Intel P200 MMX™ processor
- Plug and play motherboard with Intel socket 7
- Latest Intel 430HX chipset
- 32Mb EDO RAM (max 128Mb)
- 512k Pipeline burst mode cache
- 3.2Gb enhanced IDE hard disk
- ATI 3D 4Mb SGRAM graphics card
- Twelve speed IDE CD-ROM drive
- Soundblaster 32 wavetable sound card
- 33.6 Internal BAPT fax/data modem
- Powerful 70w stereo speaker system
- Quickshot joystick
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- 17" crisp sharp 0.28dp NI SVGA screen
- 105 Windows 95 keyboard and mouse
- Expandable midi tower case with 7 drive bays

Software

- Microsoft Windows 95 with CD & manuals
- Lotus SmartSuite 96 for Windows 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD multimedia titles

£1761.33
inc. VAT
£1499 +VAT

MJN P200MX MM Full Tower

- Intel 200MHz Pentium processor with MMX technology
- Plug & play motherboard with Intel socket 7
- Latest Intel 430HX chipset
- 64Mb EDO RAM (max 128Mb)
- 512k Pipeline burst mode external cache
- 3.2Gb enhanced IDE hard disk
- ATI 3D 4Mb SGRAM graphics card
- Twelve speed IDE CD-ROM drive
- Soundblaster 32 wavetable sound card
- 33.6 Internal BAPT fax/data modem
- Powerful 70w twin stereo speaker system
- Quickshot joystick
- 3.5" 1.44Mb floppy drive
- Enhanced parallel, PS/2 mouse and 2 high speed serial ports
- Superb 15" 0.28dp NI SVGA screen
- 105 Windows 95 keyboard and mouse
- Expandable full tower case with 9 drive bays

Software

- Microsoft Windows 95 with CD & manuals
- Lotus SmartSuite 96 for Windows 95 including, Word Pro 96, Freelance 96, Approach 96, 1-2-3, Organizer, SmartPics graphics pre-loaded
- GSP Pressworks and Designworks drawing and DTP suite pre-loaded
- GSP Homewise and Quicken v5 pre-loaded
- 10 CD multimedia titles

£1878.83
inc. VAT
£1599 +VAT

MJN P200MX 17"

As above but with 17" screen

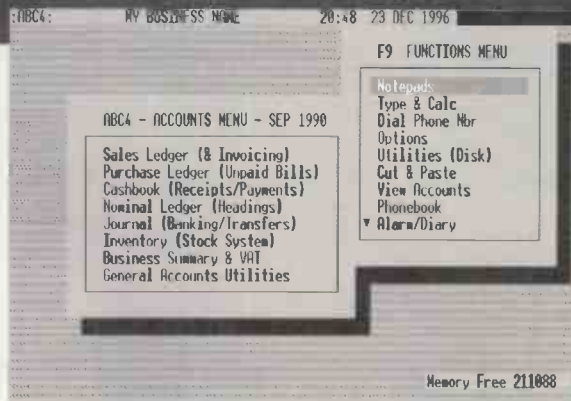
£2113.83
inc. VAT
£1799 +VAT

ABC4

ABC4 is DOS software. It's unusual, coming complete with a "typing" module, a filing module and a spreadsheet: in fact, a simple office suite. The "typing" function is a basic word processor for letters, reports and quotations, "filing" is a simple flat-file database able to store, sort, select and print information, and "Calcsheet" is a basic spreadsheet, good for cashflow forecasts. There's a label printer and a phone book too.

Apart from mailmerge, an accounts-viewing window and a cut-and-paste facility, the separate programs offer only limited integration. Neither do they compare in sophistication with similar modules from the heavyweight office suites. But they do provide all the functionality that many small companies are likely to need. The biggest limitation is the small number of printers offered (four). True, you can edit or create printer tables, but these days you shouldn't have to.

The accounting function offers a three-ledger, double-entry integrated book-keeping system with sales, invoicing and credit notes, statements, cash, banking and VAT, plus stock control. There's a proper audit trail and formal period-end procedures. You get routines for nominal journal adjustments (transfers), bankings and reporting, including



trading (P/L), balance sheet, VAT and aged debtors. There is also an option to use Cash VAT accounting.

Useful touches include a warning message if your customers exceed their pre-set credit limits (it can be ignored) and the facility to post-date your invoices. Individual invoices can be treated either as pre-paid or VAT-inclusive. In allocating money to invoices, you can choose to dispose of awkward balances by writing them off as discounts, saving many tedious journal entries.

As a mini-suite, ABC4 offers a more useful set of modules than the "big three" suites, although each section could do with more sophistication and, above all, integration. Nevertheless, it seems to have its share of satisfied users. There's an active user group

A practical suite of ancillary programs complements ABC's three-ledger accounting system

and a periodic newsletter as well.

The combination of functions and presentation seems to aim the product at business people who don't necessarily like computers, so these people could be well advised to consider it. More experienced users might like to wait for ABC for Windows which is promised for some time this year.

PCW Details

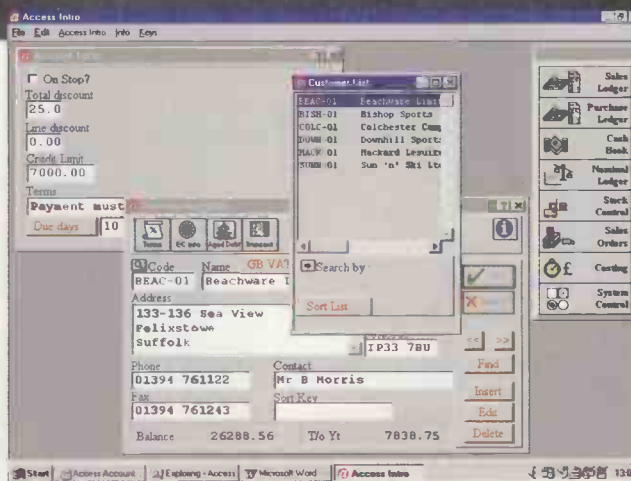
Price £293 (£249.36 ex VAT)
 Contact ABC Direct Sales 01257 480502
Good Points Frill-free and simple to use without stinting on functionality. Useful extra facilities.
Bad Points Help system could be better, some menu items could be less cryptic. No tutorial or demonstration data.
Conclusion Ideal for the computer-wary small business, especially if using older machines.
 ★★★

Access Intro

Access Intro, a cut-down version of the multi-modular Access v3, is sold only through dealers. The dealer will install it for you (for a fee), which is a good job because there is a cunningly executed deadfall which will absolutely guarantee the program won't run (it can be fixed by delving into the File Properties box). When you do get up and running, you'll probably find that the help file appears to be missing, too. These things do not make for a confidence-inspiring start, for owner-installer customers.

Access Intro gives you a standard three-ledger system (sales, purchase and nominal) with a cash book. Stock control, job costing and invoicing/sales-order processing can be had for more money, as can a multi-user licence and the facility to run more than one company or data file. These are not supplied separately but are "unlocked" from your original purchase.

The sales ledger offers the usual transaction recording, including invoices, credit notes and receipts, and you can define contract terms and EC VAT rate. If you want VAT cash accounting, there's a different version (at no extra cost). The aged debtors/creditors list can include several lines



Flexibility in feature selection is a keynote of Access Intro

facility in the costing module useful too.

Having the advantage of a low starting price, the fully expanded Access Intro is directly competing against the likes of Sage Sterling and should be useful to a wide range of businesses. It's just a shame about the imperfect conversion from its bigger brother.

of information for each customer or supplier, plus all their outstanding transactions. You can also put defaulters on "stop" (you can't send goods or raise invoices).

As well as using the usual nominal accounts, you can analyse certain transactions by department and project. And when reconciling your bank account, you can reconcile any other nominal accounts too.

Sales orders are used principally to allocate stock and immediately generate documentation like despatch notes, picking lists and invoices, making the feature ideal for distributors. Contractors and bespoke manufacturers will find the project/cost centre

PCW Details

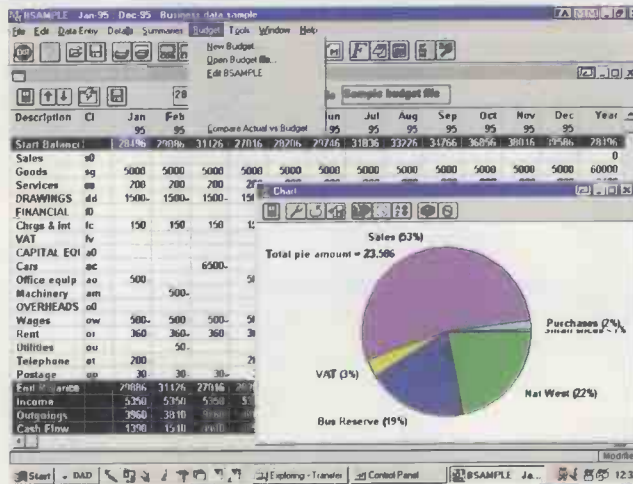
Price £347 (£295.31 ex VAT)
 Contact Access Accounting 01206 322575
Good Points Useful base module with pick-and-mix extras building up to a practical blend of features.
Bad Points Will defeat owner-installers, who will also be better with a little accounting experience.
Conclusion Traditional structure, ideal for accountants. Expensive unless you want most of the extras.
 ★★★

Money Manager

Money Manager for Windows Business Edition is now in version 5, so it must be doing it right. Also available to run under DOS, it's impressive software, particularly at the price, and especially when you consider that it's multi-company and multi-currency capable.

Money Manager certainly doesn't subscribe to the clean-screen philosophy and might be intimidating to computer tyros, especially non-accountants. It must be said, though, that half the screen is often occupied by a list of analysis codes (where others might favour drop-down boxes), faintly reminiscent of a DOS product. You can have up to 10,000 transactions per month, allocated between account codes, sub-account codes, class codes, and "mark" codes.

Account codes define your major "control" accounts like bank, cash and VAT. Sub-account codes refine these by identifying individual customers and suppliers. Class codes categorise expenditure or income, like machinery, stationery or salary, and let you analyse income/expenditure for particular classes. Mark codes are optional and useful labels which you can use to collate entries for further analysis such as separating petrol



expenses between partners without having separate class codes. You get bank reconciliation, cheque printing on your own cheques and a good selection of reports.

You can, of course, enter invoice details but there's no invoicing in Money Manager itself (see *Case Study*, page 183) so it's use your word processor or look elsewhere.

Connect Software offers two add-on programs you might find useful. At £49.95 (ex VAT), Final Accounts for Windows adds end-of-period reporting: producing your trial balance, profit-and-loss report and balance

Money Manager gives you plenty of options for analysing your accounts

sheet as well as looking after things like fixed asset depreciation, capital allowances and tax. When installed, it integrates with Money Manager (apart from having to switch menus) to provide a reasonably featured accounting system at a reasonable price. The other add-on is Office Manager, offering invoicing, a stock database, letter templates, contacts lists and more. But it runs under DOS only, which is a bit of a drawback for a Windows companion.

PCW Details

Price £94 (£80 ex VAT)

Contact Connect Software 0181 743 9792

Good Points High data-entries capacity. Multi-company.

Bad Points Potentially confusing screen layout.

Conclusion Flexible and versatile with excellent analytical features.

★★★

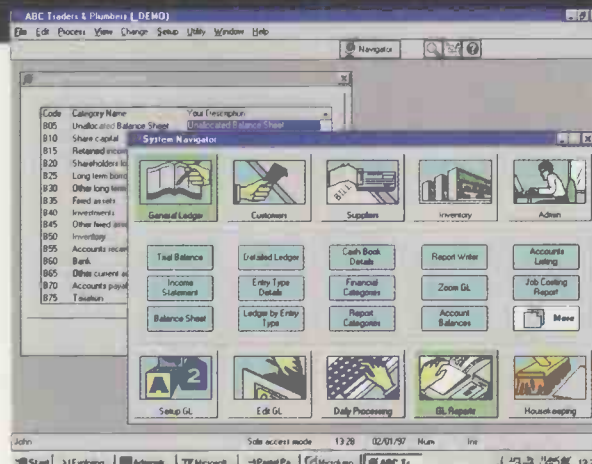
MAP Pastel Accounting

Now established in the UK under the MAP imprint, Pastel Accounting (as the former Pastel Partner would like to be called) has reached version 4.1a: version 4 is Windows-only and DOS users must continue to use version 3, which is both DOS and Windows.

Among the changes in version 4 are improvements to the interface: customisable layouts including column positions in data tables, drill-down enquiries, better reporting and a remote monitoring program. Pastel is now multi-currency as standard, handling up to 16 currencies in addition to the pound.

Pastel owes much to traditional accounting practices like double-checking, batch updating and period closing. In addition to a general ledger, cash book, sales and purchasing ledgers, invoicing, job costing, budgets and a report writer, you also get up to ten cash books, up to 30 separate tax types and up to 32 types of entry. You can create purchase orders and supplier invoices, and prepare and process quotations and sales orders.

In the UK you also get Pastel's "manufacturing" module (an extra elsewhere) with bills of materials and parts build-up. A linked codes function brings up all the inventory codes associated with an invoice



item — useful where given items are sold separately and in standard packs or assemblies. As well as inventory item codes, Pastel also handles bar codes and bin numbers for inventory items. Bills of materials can include labour and overheads as well as components by description and quantity, with Pastel calculating the finished cost, mark-up and selling price of the manufactured item. You can also break down a manufactured item, recreating the original component items.

You can't say Pastel isn't feature-rich. For instance, it has a special date-limited price list for seasonal items or special offers, individual prices for each inventory item (coded to individual customers) and multiple delivery

Personal Computer World

Highly Commended

Choose to navigate by Pastel's comprehensive System Navigator or the standard Windows menus

addresses for each customer. You even get a card game, a puzzle and a doodle pad.

The manual, to quote Boswell quoting the 18th century Duke of Gloucester, is a "damned thick, square book" and all the better for it. And in addition to the normal help file, there's a Knowledge Base of tips and techniques.

PCW Details

Price £469 (£399.14 ex VAT)

Contact MAP Computer Products 0161 624 5662

Good Points Arm-long features list. Multi-everything.

Bad Points Assumes some accountancy knowledge.

Conclusion A fully-featured system for almost any business as long as it has some accounting expertise.

★★★★

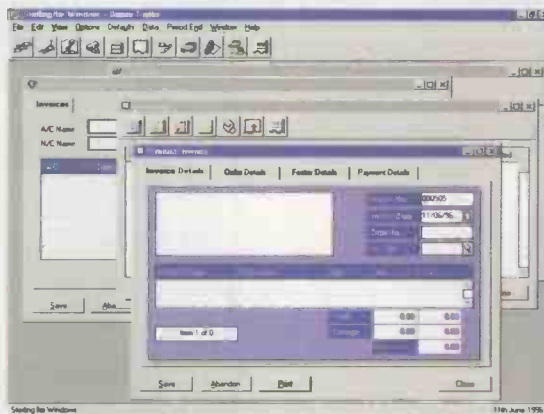
Sterling Financial Controller

Acknowledged as the largest British software company, Sage offers accounting software covering all sizes of business and most platforms. The Sterling range is no exception, boasting a progressive functionality, from Accountant at £350 through Accountant Plus at £500, to Financial Controller (£650) reviewed here.

For your money you get the usual three ledgers (sales, purchase and nominal) plus invoicing, sales and purchase-order processing, stock control, credit control, fixed asset management and a wide range of customisable management reports. There's a separate payroll program available for £300 (plus VAT).

You can link Financial Controller to Sage's own dedicated contact manager, TeleMagic, as well as to other business software like word processors, spreadsheets and databases. You can produce invoices (and credit notes) for goods or services, the first including quantities and rates. Raising invoices for stock items automatically updates stock control.

You get multi-company and multi-user flexibility and the package claims readiness for the year 2000 (but not for the euro). Batch invoicing, better drill-down, free text invoicing, and bank reconciliation are new features. You can analyse your invoice entries by user-defined tax, nominal and department codes



either item-by-item or for the entire invoice. There are separate product categories, too.

To get the best out of Sterling you can (for a fee) take advantage of Sage's support and training services via a network of over 2,000 UK dealers providing specialist support for small- and medium-sized business customers.

Sage claims it will produce year 2000-compliant versions of all its Windows software packages during 1997, so make sure you get a current copy. This will include the Sterling range of accounting and payroll products, Sovereign for Windows, TeleMagic contact management software, and the Timeslips time and fee billing package.

All Sage business-accounting software

Sterling's invoices can be entered from the keyboard or generated by the sales-order processing function

products are accredited by the Institute of Chartered Accountants in England and Wales (ICAEW).

Sage set the standard for small-business accounting software and is a yardstick by which others measure themselves. Pricewise, particularly if you include support and budget for some training to make the most of its features, it starts to look a bit expensive.

PCW Details

Price £763 (£649.36 ex VAT)

Contact Sage Group 0191 255 3000

Good Points Comprehensive and flexible. Excellent report and form layout formatting.

Bad Points May be overkill for many small companies. Benefits from some accountancy knowledge.

Conclusion If you need comprehensive financial controls, Sterling Financial Controller is one to look at first.

★★★★

TAS Books 2

There are two TAS Books programs. TAS 1 is the starter program with its three ledgers, cash book and invoicing. TAS 2 is the upgrade. Functionally it is identical, but adds sales- and purchase-order processing and stock control. Accredited by the ICAEW, it offers a drill-down facility to the ledgers and daybooks and there's a semi-automatic double-entry function plus more flexibility in handling recurring transactions.

The stock-control function can handle standard products, non-stock items, assemblies and consumables. Each item can be assigned a category, and there is support for serial- and batch-number tracking (essential if you operate quality control). You can monitor item movement history, stock valuation, stock levels and stock taking. Purchase-order processing handles over-deliveries and short-deliveries, including price and quantity mismatches, for contract and consumable materials. Stock records are automatically updated by the sales-order processing operation, which will also look after back-orders and negative stock.

The order-processing function also generates quotations, pro-formas, order acknowledgements, invoices and credit notes. It gives detailed sales analyses by



customer, product or salesperson. Sales-order (and purchase-order) processing automatically updates Intrastrat details if you deal with the EEC.

You can use up to eight rates of VAT and accrual and cash-accounting facilities. You can switch between them at any time or you can ignore VAT if you are not registered.

Although incorporating period-end procedures to advance your accounting year, TAS Books doesn't actually close off any transactions so you can bring up any item in detail from however long ago, thereby giving you the best of both worlds.

TAS Books runs under DOS, which partly

A wide-ranging feature set is available to users of TAS Books 2

accounts for obscure error messages: "Please run program 0.3.1" doesn't help if there's no clue to which one that is.

It cannot be denied that the swing is away from DOS, making TAS less likely to be acceptable to a first-time user with a new computer full of Windows software. Megatech's forthcoming version for Windows 95/NT may rectify that, promising a median between the functionality of TAS Books 1 and 2.

PCW Details

Price £410 (£348.93 ex VAT)

Contact Megatech Software 0181 874 6511

Good Points Good range of facilities, coupled with traditional accounting procedures for those that need them.

Bad Points You really need to be an accountant to get the best out of it.

Conclusion Nicely suited to traditional accounting procedures, TAS Books 2 gives you a lot for your money.

★★★

The desktop bank

Online business banking has finally arrived: the ability to interrogate your bank account by computer and modem, pay cheques, change standing arrangements and order new services.

Over 68 percent of the UK's working population already benefits indirectly from BACS, a form of online banking. The Bankers Automated Clearing Services (also known as Cashless Pay, or Direct Pay, or Direct Credit) is the reverse of direct debit. Instead of giving someone your bank account number and authorising them to subtract unspecified amounts of cash from it, you give them your bank account number and let them put in unspecified amounts. BACS can be used to pay suppliers of goods and services, even occasional ones, but its main application tends to be in the administration of payroll, pensions and expenses. Its main benefits are reduced risk of robbery, prompt and regular wages payments (because they're automatic) and lower insurance premiums.

You need accounting software with a BACS capability and this tends to be the higher-priced modular systems (Global, MAP, Pegasus and Sage). Or, you can use a payroll bureau instead. BACS can supply leaflets and a demo disk, comprising a presentation and a benefits calculator.

For other services you should talk to your own bank. Lloyds Bank offers LloydsLink, which also lets you interrogate your bank accounts from your own computer. NatWest's BankLine Cash Manager*.

Right The Cashless Pay disk will prepare a savings estimate based on your own figures

Below NatWest's BankLine Checkout disk will verify your computer's compatibility

AN ILLUSTRATION OF POTENTIAL SAVINGS OF SWITCHING TO CASHLESS PAY VIA BACS

Prepared By : Hugh Jampton
For : Purple Press
On : 9/9/95

	Current Cost B.F.	BACS/W	Sub Total	Estimated Saving
No. of Employees				
Stationery				
Secure Area Programme				
Security carrier insurance				
Input of Wage data				
Wage Packet/CHK				
CHEK Wages/CHK				
Distribution				
TOTAL	2600.00			231.00

Key to controls: Back, ESC Quit, F3 to return to Main Menu, Next

Check System Configuration
NatWest BankLine

Your computer has:

Computer type	American Megatrend, 80386
Memory	3072K
Video card	VGA, Dchhd, ProDesigner II
Dos version	6.2
Network	MS-NET Compatible
Mouse	Serial Mouse 8.20
Parallel ports	1
Com ports	2
Windows version	3.1
Modem type	Unknown
Free disk space	422 Mb

Please insert your modem type.

Buttons: Back, Exit, Continue, Next

You can move sterling and foreign currency between your accounts, as well as making payments. You can also calculate projected cleared balances.

The Royal Bank of Scotland operates its Royline service, linking your computer to your bank. Royline lets you administer your own accounts as well as being able to transmit your payroll details to the bank on pay day. Other services include multi-account reconciliation reports and credit-card processing.

As well as standard BACS and its Mid-Tel phone transfers, Midland Bank has its Hexagon service for cash management between your own accounts, trade services (documentary credits) and market information. Like many others, Hexagon will start up your computer, unattended, and communicate with your bank at cheap off-peak times if

required. Many of these services run independently of your accounting system, using software supplied by the bank. ■ BACS 0800 191191

Keeping up to date

As you will have noticed, there is much excitement about the implications for computer software come the turn of the century. The year 2000 date change has been described as a ticking time bomb which could completely wipe out your business unless you take steps to do something about it now. Yes, you.

Not only do you need to know that the integrity of your software is secure, but that your suppliers' software can be trusted, too. So start pestering.

The simplified explanation is this. Dating from the time when memory was not so readily available, programmers saved a couple of bytes on every instance of a date by assuming the century. Thus, 1996 is represented by 96 and 1999 by 99.

There is plenty of general information about the year 2000 on the internet, although the content is almost entirely American

When the millennium arrives, you might expect 2011 to be represented by 11, except that your software will think you mean 1911 and process accordingly.

Users of packages like those reviewed here will need to get a replacement from the publisher (but don't expect it to be free). That will take care of future entries but what about

historical data, already sitting on your hard disk in two-figure format? If you sell date-stamped goods or services, you'll need to get it all converted to four figures. Start now. Your accounts data should be less of a problem because you'll simply close at the end of the year and treat it as historical. You'll have to carry over any time-sensitive entries when you start your new year, of course.

The table shows which packages are currently ready for the year 2000, although all publishers say, of course, that by the time 2000 comes, they'll be ready for it.

The other significant date you need to consider is earlier: 1st January, 1999. This is when, if all goes as planned, the euro will come into circulation. If the UK joins that dubious club, your accounts will have to be able to handle a dual base rate (the euro and the pound) and be able to trade in either. This is not the same as having a multi-currency capability. Read our Table of Features (page 186) to see which packages are ready.



Case Study: TAS Books 2 at Avery Dennison

Avery Dennison (Ireland) is part of the Avery Dennison Corporation, a leading labelling and stationery company. During the past two years, Avery's adoption of a just-in-time system for its warehouse operation coincided with the introduction of new accounting systems throughout the organisation, which together have provided some dramatic decreases in stock holdings. The accounting system chosen was TAS Books 2 by Megatech, and replaced a system based on an IBM System 36 minicomputer.

At its Dublin distribution centre, Avery has implemented all the system's modules including stock control, purchase-order processing and sales-order processing. At its manufacturing plant in Cork, a similar system manages an operation producing ranges of document folders and other products for the export market. At both sites, four-user Novell networked systems are used by sales, purchasing and warehouse staff as well as by financial management.

According to Frank Morrison, Avery Dennison's financial manager, who is responsible for both sites, the performance gain was considerable. "The report generator is powerful enough to produce all the information we want very quickly," he said. "In some areas of the business, resources tied up in stock have been cut by more than 70



percent. It is impossible to attribute savings to individual systems, but rapid access to sales and stock purchasing information, via TAS Books 2, plays an important part."

At the Dublin warehouse, managed by warehouse controller, Ray O'Brien, orders for replacement stock are automatically generated at pre-set stockholding levels. These "suggested orders" are then cross-checked with reports produced by TAS Books before issuing actual purchase orders to suppliers.

"We use Low Stock and Product Movement Reports generated three or four times a week as the basis for actual orders," explained Ray O'Brien. "But, by generating suggested orders, the system saves a considerable workload."

TAS Books 2 is unusual in that it has real-time stock control with sales-order information communicated to the stock control module at the end of each line of an order. Many other systems update the stock system in periodic batches or at the end of a completed order that may include dozens of items. Real-time operation is of particular value when telephone sales staff are competing for limited stock of the same item. Equally important is the facility to re-credit items to stock the instant an order is cancelled or altered, the salesperson simply hitting the cancel button to make that stock immediately available for other orders.

From the financial management point of view, Frank Morrison can quickly and easily edit existing transactions like mis-allocated figures, on the days he visits the Dublin site. "The Account Processor avoids the need for contra-entries, so it is quick, and accounts remain clear and uncluttered," he said. "This all helps to ensure that we can always get a clear picture of the situation." Once a change has been made, all other aspects of the accounts affected are immediately updated.

Avery Dennison discovered that learning to use TAS Books 2 proved relatively quick and easy for all levels of staff. To simplify its operation, the system is tailored so that operations staff only see that part of the system they actually use. ■

Case Study: The ABC of photojournalism

One Christmas, Tony Sleep was given a Box Brownie camera. Within weeks he'd taken a photograph which unaccountably turned out well and he has had the shutter-bug ever since. Not that he turned professional right away (he was eight years old at the time); he tried his hand at a variety of jobs before deciding to embark on a career as a freelance professional photographer.

Today, after the best part of two decades, he is a dedicated press photographer with an established clientele of magazine and newspaper publishers; mainly the specialist consumer and trade press. You'll find his work in motorcycle magazines, for example (he's a biker himself), medical journals, RNIB publications and the AA magazine. Based in

London, he does editorial work for some charities and housing organisations. Most of his business comes from referrals and recommendations.

As a sole trader, with no employees and no statutory audit requirements, Tony doesn't need fully-featured accounting software. Nevertheless, he chose ABC. Tony's been using ABC for ten years now and likes it principally for its flexibility, simplicity and speed. He doesn't use the Calcsheet or Typing modules any more, but does find the flat-file database useful in keeping track of over 140,000+ negatives by subject, date, location and client. He can get at that information from the Accounting module. The database facilities also enable him to design any report, labels, or CSV export he might want, using the accounts data, freeing him from the confines of standard reports.

Ideally, Tony would prefer the Windows environment but considers that "Nothing I have looked at comes close to ABC4's clunky old DOS accounts for speed and simplicity".

Most of Tony's work is commissioned, which means he gets the chance to discuss rates and fees before

proceeding. He requires flexibility in handling his invoice charges because his fees can vary (he does not charge charities at his commercial rate). Sometimes, though, he has to accept the rate offered. ABC lets him set up several "stock" items, the codes for which he uses as service descriptions, complete with rate or flat-fee charges. This considerably simplifies the invoicing procedure to his regular customers. One-off expenses can also be added to his final invoice.

Tony uses the annual services of an accountant to prepare his end-of-year figures. He closes his books at the end of each month and calculates his VAT quarterly. As a non-accountant, he believes it is important and economical to use software which is simple to operate, while at the same time presenting his figures in a form familiar to his accountant.

■ Tony Sleep 0181 840 3463;
email halfone@cix.co.uk



Tony Sleep, photographer



Back Up Your Hard Disk with CD-Rs from £3.49 (£4.10 inc VAT)

Product Description £.ex VAT £ inc VAT

PHILIPS 2x 6x SCSI CD RECORDERS

Let's make things better.



The Philips New CDD2600 (2x Record 6x Play) SCSI CD Recorder conforms to the new CD UDF standard

The CD UDF (Universal Disc Format) standard defines a common scheme of packet writing to assure interchangeability of CD-R discs & to greatly increase performance and flexibility when storing large & small files on CD-R. With CD UDF and yet to be released software, the CD-R will have the capacity to behave much like a floppy disk but with a 680MB capacity. CD UDF also creates a bridge between the ISO 9660 layout of CD-ROM discs and the UDF file format selected for DVD.



CDD2600 Features

- Records CD-ROM (XA), CD-Bridge multi-session, CD-I and CD-Audio discs
- Conforms to Write-Once CD format (Orange Book part II)
- Track At Once, Disc At Once and Incremental Packet Writing modes supported
- 2x speed recording and up to 6x speed playback
- Motorised tray for easy operation
- SCSI-II interface
- 1MB buffer
- Windows 95 and NT plug-and-play as a playback CD-ROM drive

CDD2600

£269

ex VAT

Philips CDD2600 Internal CD Recorder 2x record 6x play (bare drive)	£269	£316.08
Philips CDD2605 External CD Recorder 2x record 6x play (bare drive)	£323	£379.53

YAMAHA 4x 6x SCSI CD RECORDERS



Introducing the New YAMAHA CDR400 (pictured) + CDE400 - The World's First 4x Record 6x Play 2MB Buffer CD Recorders.

Thanks to the developed exclusive optical head, spindle motor, high speed signal processing LSI and control unit, Yamaha have engineered a super high precision 4x recordable and 6x readable internal CD drive the CDR400 for the PC. (The external version, the CDE400 is available for PC and Mac users).

The selectable speed allows for switching between 4x, 2x and 1x for recording with up to 6x playback.

Format Compatibility - This two-in-one unit is a CD drive that boasts highly compatible recordable/readable features in 4-formats CD-ROM (including MPEG and VideoCD), CD-ROM / XA, CD-I and CD-DA. An analogue audio terminal has been added for convenient CD-DA operations.

CDR400

£427

ex VAT

Yamaha CDR400C Internal CD Recorder 4x record 6x play (bare caddy or tray drive)	£427	£501.73
Yamaha CDR400TX External CD Recorder 4x record 6x play (bare tray drive)	call	

SCSI CD RECORDERS (BARE DRIVES) WITH SOFTWARE

Philips and Yamaha CD Recorders in this section come with a choice of CeQuadrat ToGo! or Elektrotron Gear both for (Windows 3.11 / Win 95). This package does not include SCSI card or cables.

Philips CDD2600 Internal CD Recorder 2x record 6x play with software	£286	£336.05
Philips CDD2605 External CD Recorder 2x record 6x play with software	£340	£399.50
Yamaha CDR400C Internal CD Recorder 4x record 6x play with software	£444	£521.70
Yamaha CDR400TX External CD Recorder 4x record 6x play with software	call	

PressIT CDR LABEL PLACING SYSTEM

PRESSIT Recordable CD Label Placing System



If you are one of the growing number of users that have come to appreciate the benefits of low cost CD-R, you appreciate the need to give your CD-R that professional finish top side.

While a felt tip pen marked CD-R is acceptable for personal use, when it comes to distributing your finished work you need something that's going to look good and reflect the quality of your digital data.

That's where PressIT comes in. You can now print special pre-cut labels in your laser printer and PressIT will ensure your label is accurately positioned and fixed crease and bubble free to your CD. PressIT helps you finish off your CD with that professional image.

Rocky Mountain PressIT Label-Placer with 100 CD-R labels	£39	£45.83
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CD RECORDER KITS



cord up to 650MB on a single CD-R. Sourcing all the components needed to upgrade your PC to a CD recording system can sometimes be a bit time consuming. To overcome this we offer a range of all-you-need CD Recorder upgrade kits. **All-you-need CD Recorder Upgrade Kit** CD Revolution all-you-need CD Recorder Kits come complete with everything needed to work with your appropriately specified PC.

Kit Contents

- Choice of Philips or Yamaha Internal SCSI CD Recorder
- Windows 3.11/95 based CD recording software CeQuadrat ToGo or Elektrotron Gear
- Adaptec 1505 ISA SCSI Card, software, cables
- CD-caddy (where applicable)
- 2 blank 74 minute recordable CDs & CD marking pen
- Easy to follow installation and user instructions

CD Revolution CD Recorder Kits Recordable CDs are the most effective, durable, permanent storage medium and can provide decades of safe storage. Any file can be quickly accessed and read directly by using any multisession CD-ROM drive. To record a recordable CD (CD-R) you need a CD Recorder with software which will allow you to re-

CDR packaged - CDD2600 Internal CD Recorder 2x record 6x play with accessories	£335	£393.63
CDR packaged - CDR400 Internal CD Recorder 4x record 4x play with accessories	£493	£579.28

EXTERNAL CD RECORDERS WITH INTEGRAL HDDs

CD Revolution Storage Micro Tower with integral SCSI CD Recorder and SCSI HDD

The Storage Micro Tower is an external mains powered system which includes a choice of CD recorder with either two speed or four speed record and four speed or six speed playback along with a choice of fast SCSI hard drive with a storage capacity of 2, 4 or 9GB.

It connects to a PC or Mac via a single SCSI cable and comes complete with a choice of WinOnCD ToGo CD recording software for PC users or Toast CD recording software for Mac users.

Given it's portability the CD Revolution Storage Micro Tower is ideal in any application where budgets on large storage/CD recording are restricted or in installations where security is an issue and where both hard drive and CD recorder need to be locked away in a security/ fire safe after use.



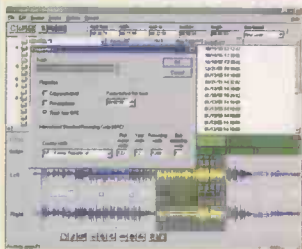
CD Revolution/ Philips CDD2600 2x 6x with 2.0GB SCSI HDD+software	£728	£855.40
CD Revolution/ Philips CDD2600 2x 6x with 4.3GB SCSI HDD+software	£1,050	£1,233.75
CD Revolution/ Philips CDD2600 2x 6x with 9.0GB SCSI HDD+software	£2,035	£2,391.13
CD Revolution/ Yamaha CDR400 4x 6x with 2.0GB SCSI HDD+software	£897	£1,053.98
CD Revolution/ Yamaha CDR400 4x 6x with 4.3GB SCSI HDD+software	£1,219	£1,432.33
CD Revolution/ Yamaha CDR400 4x 6x with 9.0GB SCSI HDD+software	£2,204	£2,589.70

RECORDABLE CDs (CD-Rs)



CIS (no label/ blank) Recordable CD, 4x speed, 74 mins 650MB, Orange Book		
10 to 49 - price each	£3.49	£4.10
50 to 99 - price each	£3.38	£3.97
100+ - price each	call	call
Philips Label Recordable CD, 4x speed, 74 mins 650MB, Orange Book		
10 to 49 - price each	£3.75	£4.41
50 to 99 - price each	£3.64	£4.28
100+ - price each	call	call
TDK Label Recordable CD, 4x speed, 74 mins 650MB, Orange Book		
10 to 49 - price each	£3.86	£4.54
50 to 99 - price each	£3.75	£4.41
100+ - price each	call	call
Yamaha Label Recordable CD, 4x speed, 74 mins 650MB, Orange Book		
10 to 49 - price each	£3.62	£4.25
50 to 99 - price each	£3.52	£4.14
100+ - price each	call	call

CD RECORDER SOFTWARE



CeQuadrat WinOnCD 3 - Amazing all-in-one CD Recording Software

- Native Windows 95 program - Supports the Joliet extension of ISO9660 for long file names of up to 64 characters, international character sets, unlimited directory tree depth, etc. Also works with Windows NT
- CD formatter for all current CD formats, CD-ROM, CD-Digital Audio, CD-ROM XA, PhotoCD (requires PhotoCopy and a Philips/Kodak CD recorder), CD-I, Video CD (requires VideoPack), Bridge Disk, Hybrid Disk, CD Extra and Bootable Disk

CeQuadrat WinOnCD 3.x for Windows 95	£299	£351.33
CeQuadrat WinOnCD 3.x (upgrade from WinOnCD 2.x) for Windows 95	£149	£175.08
CeQuadrat WinOnCD 3.x (upgrade from WinOnCD ToGo) for Windows 95	£249	£292.58

Elektrosen GEAR - a full featured CD recording software package compatible for use with most popular CD recorders.

- ISO-9660 (Up to level 3 support)
- 64 character file naming with optional ISO override conventions
- Automatic/manual character conversion options
- XA, XA Interleaver (Form 1, Form 2)
- Pre-interleaved file support
- Integrated Manual Interleaver with ADPCM control
- EB, Bridge, and MMCD formats
- Digital Audio and Mixed-Mode Disc
- 44.1K Red Book audio
- WAV, AIFF file conversion and header editing

- Advanced HFS Support allows True Hybrid Disc with shared data areas
- Improved functionality for CD DA recording
- Track at once or Disc at once CD Recording (if supported by the CD recorder)
- Incremental Packet Writing for economical back up or data exchange

High Speed Formatting The full "on the fly" writing option takes almost no space on the hard disk makes CD production faster and directories can be placed onto any area of the CD. Furthermore the CeQuadrat Smart File Placement allows the best possible placing for a particular application.

New WinOnCD 3.0 CD formats

- Bootable Disc for direct booting from the CD (if supported by the PC's BIOS)
- CD-Extra (formerly CD PLUS) in the BlueBook as a multisession disc containing audio in the 1st & video, lyrics etc in the 2nd session.
- Advanced HFS support now enables the user to create Shared Hybrid CDs from the PC which up until now was only possible on Mac.
- Advanced Audio Support
- Incremental Packet Writing (plus loads more)

- Enhanced Music CD (CD plus)
- DA and Data tracks in Multi-session XA format (Microsoft, Sony, Philips standard)
- Multimedia Authored Files/Images
- CD-I, VideoCD files
- XA (Bridge, EB, PhotoCD)
- Game Titles (3DO, Nintendo, Sega, Sony)
- Proprietary & Custom Disc Control
- Subcode and Pregap setup
- Mode select and sector sizing
- Track List Files
- Audio, Data, Mixed-Mode
- Variable pregap size
- Orange Book Mastering Modes
- Track at Once
- Disc at Once
- Multi-session
- Wide Recorder Support

Elektrosen Gear Desktop - Multimedia	£89	£104.58
Elektrosen Gear - Multimedia - UNIX, HP, Sun	£749	£880.08

ALEA CD-MAKER



ALEA CD-MAKER 4/41 Produces multiple CDs at up to x4 speed

The ALEA CD-Maker System is a new generation of CD-ROM duplicator which is a stand alone unit and does not require connection to a host PC, although there is a facility to import a CD-image from an external PC.

Using low cost recordable CDs (CD-Rs), CD Maker is able to copy and create CDs in ISO 9660, HFS, CD-I, CD-Audio, VideoCD, Unix formats and any CD which is read able on any standard CD-ROM drive.

A unique cache design ensures futurability of CD-Maker right up to 16x writing performance.

CD-Maker's 2 split process technology maintains a 2.8MB/sec aggregate transfer rate during recording of 4 concurrent CD-ROMs. With this kind of speed, production rates of up to 16 CD-ROMs per hour can be achieved. This will save tremendous time for large ar-

chival storage projects or where distribution of information through multiple copies is needed.

CD-Maker 4/41 Features

- Platform and operating system independent
- multiformat and networkable
- able to create CDs in ISO 9660, HFS, CD-I, CD-Audio, Unix formats
- makes CDs that are useable on any standard CD-ROM drive

CD-Maker 4/41 - Command List Summary

The letters used are those used on the front panel.

- A Audio Processing
- Burn Audio Track(s)
- Import Audio from CD-ROMsource SCSI Device Select
- delete existing TOC descriptor
- display CD table of contents
- display CD-Maker TOC
- import audio from CD to cache
- import by track number
- import by MSF standard
- quit
- Import Audio from .WAV file
- Play Audio from CD-Maker
- Burn a New CDR
- CD to CD Copy
- C Execute Diagnostics on CD-Maker
- E Export Cache Image File
- F Low Level Format of CD-Maker
- G Grab a DOS Raw Image File
- 1 Import CD-Image from External PC via SCSI-2
- K Kill any pending SCSI Process
- L List connected SCSI Devices
- M Make ISO from Split/ External
- P CD-I Processing
- Check CD-I File for Sync Field & Length
- Copy CD-I File to CD-Maker
- Burn CD-I Track
- View Current CD-I Image Info
- Q Quick Format
- R Re-install or Update Software
- S Stand By
- T Track Validator
- U Update CD-Image File
- V View CD Image Information

Alea CD-Maker 4/41 - CD Mastering Station with 4 x CDR400	£6,999	£8,223.83
Alea CD-Maker 8/41 - CD Mastering Station with 4 x CDR400 + 4 x CDE100 II	£9,999	£11,748.83

PCs with a difference from CD Revolution



Product Description £ ex VAT £ inc VAT

CD REVOLUTION CD RECORDING PCs



Our Intel Pentium Processor based Multimedia PCs play CDs at 6x and records CDs at 2x

Think about it. Would you purchase a VCR that could play video tapes but couldn't record them? Probably not!

So why think about purchasing a multimedia PC that can play CDs but can't record them?

Costing only a few pounds, recordable CDs are the most effective, durable, permanent means of storing up to 650MB onto a single CD and can provide decades of safe storage. Any file can be quickly accessed and read directly using any multisession CD-ROM drive or CD-Recorder on any PC.

Alternatively you may want to use recordable CDs (CD-Rs) to distribute large amounts of data, including imaged and OCR documents, to

your clients or throughout your organisation or even publish your own multimedia titles.

Our CDR Record-26 Pentium processor-based PC comes complete the new Philips CDD2600 2x record and 6x play CD Recorder, with easy to use Windows 95 drag-and-drop CD recording software.

The CDR Record-26 is a part of our range of PCs that all do that bit extra

CD Revolution PC Specifications

- Choice of Intel 133/ 166MHz Pentium® Processor Motherboard with 256KB Cache 64-bit Memory, Pipeline Burst Cache
- or choice of Intel 180/ 200MHz Pentium® Pro Processor with Aurora ATX Motherboard.
- 32MB EDO RAM expandable to 128MB (72-pin)
- 1.6GB fast IDE Hard Drive + 3.5" 1.44MB Floppy Drive
- SCSI Card + 3.5" 1.44MB Floppy Drive
- 16-bit Sound Blaster Sound Card + Yamaha YSTM15 Speakers
- G-Force 128-bit video card 2MB RAM
- 15" High Res Colour Monitor (The monitor pictured is an alternative slightly extra cost 17" monitor)
- Professional Keyboard & MS Ergonomic Mouse + Windows 95
- Internal Philips CDD2600 - 2x speed SCSI CD Recorder with 6x playback with 2 blank CDs
- or Internal Yamaha - 4x speed SCSI CD Recorder with 2 blank CDs (please add £150 to the prices below)
- Windows based CD recording software (loaded)
- Adaptec SCSI card for CD Recorder

CDR PC with Intel 133MHz Pentium + Philips CD2600 2x 6x CD Recorder	£1,299	£1,526.33
CDR PC with Intel 166MHz Pentium + Philips CD2600 2x 6x CD Recorder	£1,399	£1,643.83
CDR PC with Intel 180MHz Pentium Pro + Philips CD2600 2x 6x CD Recorder	£1,599	£1,878.83
CDR PC with Intel 200MHz Pentium Pro + Philips CD2600 2x 6x CD Recorder	£1,699	£1,996.33

CD REVOLUTION MPEG-1 ENCODING BASED PC



This MPEG real-time encoder PC is only for users with vision

If you're in the business of impressing people by way of multimedia presentations or multimedia titles you need impressive equipment to do the job.

When it comes to making an impact there's nothing better than a well thought out interactive, digitally encoded MPEG television program that can be viewed in full-screen full-motion video on a computer monitor or TV set, along with stunning stereo sound.

Our CDR P MPEG-1 Encoder PC with CD recorder can directly take sound & vision from quality cameras or playback equipment and in real-time encode directly onto the system hard drive.

Playback quality can be equivalent to S-VHS with a stereo sound quality to match. MPEG-1 is now part of the MPC-3 standard and is

set to be the digital television de facto standard for PCs. But if you are waiting for MPEG-2 then for a cool £27,000 ex VAT we can even supply you a broadcast quality MPEG-2 encoding PC.

CD Revolution PC Specifications

- Choice of Intel 133/ 166MHz Pentium Processor with Elite Motherboard, Triton chip-set, 256KB Cache 64-bit Memory, Pipeline Burst Cache
- or choice of Intel 180/ 200MHz Pentium Pro Processor with Aurora ATX Motherboard.
- 32MB EDO RAM expandable to 128MB (72-pin)
- 2GB fast SCSI Hard Drive + Adaptec 2940 PCI SCSI Card + 3.5" 1.44MB Floppy Drive
- 16-bit Sound Blaster Sound Card + Yamaha YSTM15 Speakers
- G-Force 128-bit video card 2MB RAM
- 15" High Res Colour Monitor (The monitor pictured is an alternative slightly extra cost 17" monitor)
- Professional Keyboard & MS Ergonomic Mouse + Windows 95
- Windows based CD recording software (loaded)
- Internal Philips CDD2600 - 2x speed SCSI CD Recorder with 6x playback with 2 blank CDs
- Adaptec SCSI card for CD Recorder
- OmniMedia Z-Lite real-time full-screen full-motion MPEG-1 Encoder and Decoder



OmniMedia Z-Lite is a high quality, easy to use video codec for your desktop and the Internet. Its a real-time audio/video MPEG-1 encoder/decoder PCI board with s-video and composite video inputs, as well as stereo audio inputs and outputs. It performs encoding and decoding and has video conferencing capabilities all on a single board.

CDR PC with Intel 133MHz Pentium + OmniMedia real-time MPEG-1 Encoder	£1,749	£2,055.08
CDR PC with Intel 166MHz Pentium + OmniMedia real-time MPEG-1 Encoder	£1,849	£2,172.58
CDR PC with Intel 180MHz Pentium Pro + OmniMedia real-time MPEG-1 Encoder	£2,049	£2,407.58
CDR PC with Intel 200MHz Pentium Pro + OmniMedia real-time MPEG-1 Encoder	£2,149	£2,525.08



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Case Study: A friend to Saint Francis

Formerly in practice providing a service to small businesses, now a consultant with Maynard Heady, Don Heady is a chartered accountant, a member of the Council of the Institute of Chartered Accountants in England and Wales and a member of that body's IT faculty committee. He's the invited founder and, it has to be said, sole member of SPUD (Society for the Preservation of Users of DOS). He is honorary treasurer of the Saint Francis Hospice Development Trust and one of its trustees.

Saint Francis Hospice, which is in Havering-atte-Bower, Romford, is a registered charity offering care to patients with cancer or other terminal illnesses. It offers in-patient and day care, a home-care service and has a telephone advice line. It's also an education

and resource centre, teaching others about the needs of patients who are seriously or terminally ill.

The Trust derives its income entirely from donations, with its expenditure, apart from its own overheads, being by grants to the hospice, thus putting both sides of its day-to-day finances on a cash basis. On taking up the office of treasurer, one of Don's first improvements was to computerise its financial records which, until then, had been manually maintained. Being a Money Manager user himself, and thoroughly familiar with its potential, he installed that software — the DOS version 4. This provided the necessary cashbook and investment recording facilities.

The Trust needs to keep records of expenditure, all its sources of income and whether donations are private or corporate.

Money Manager's Class Codes take care of this. In addition, the Trust would like to know who its individual donors are, so Money Manager's "Marks" (additional and optional codes which can provide an extra level of analysis without affecting or subdividing existing analysis categories) provide the solution.

The Windows version 5 has now been installed to take advantage of the greater analysis provided.

The hospice uses both versions of Money Manager to monitor its £2m income and a similar amount of expenditure, which requires a considerable degree of analysis. The hospice perseveres with Money Manager for DOS because of its speed of data entry. It uses the Windows version for its drill-down facility which helps when examining monthly reports or year-end figures. With both the hospice and its fundraising trust using Money Manager, accountants at both organisations can be familiar with each other's systems, irrespective of whether they prefer DOS or Windows.

■ Saint Francis Hospice 01708 753319

■ Don Heady 01277 362905;
email heady@cix.compulink.co.uk



Don Heady, consultant and founder of SPUD



Case Study: Capital takes the load

Based in Felixstowe, but drawing much of its business from North Sea ports and terminals, PJ Trailer Services offers a repair, maintenance and MOT-preparation service to RoRo (Roll-on-Roll-off) freight companies in East Anglia. We're talking about 38-ton, eight-wheeler, articulated flatbeds that take bulk goods and containers around the country. Before setting off, each must undergo a service and roadworthiness inspection, which is where PJ Trailer Services comes in.

A family firm, now run by the founder's son-in-law, Derek Crisp, PJ Trailer Services has eight fitting staff: three of them, including Derek, are directors. Derek himself was one of the East Anglian Daily Times' 1994 Business Personalities of the Month for rescuing the company from near-bankruptcy during the recession, ten years ago.

The books and other office duties are undertaken by Derek's wife, Ann. The business is a mixture of established customers, most with long-term contracts, plus a sprinkling of one-off repairs. Altogether, the company reckons to MOT over 800 trailers a year, turning over about £360,000 a year which makes it one of the biggest independent trailer service companies in the region. It operates a 24-hour emergency breakdown service, with its own tractor (cab) units to fetch and return trailers.

To computerise the accounting system, Derek and Ann chose Capital on the advice of their accountant and were one of the software's first customers. So far they have implemented the

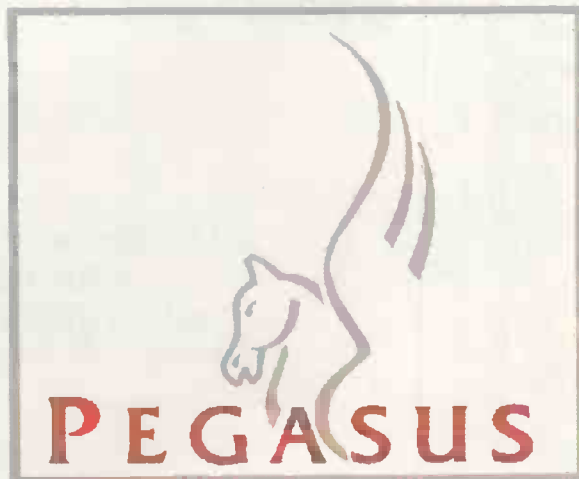
sales and purchase ledgers, tracking their labour and contract materials. And Capital produces their invoices, which are a mixture of goods, bought-in services and labour charges. Although they keep stock (consumables and essential trailer parts) they haven't yet implemented stock control, but this is planned. They're presently using Capital as a final accounting record only for payroll.

The Crisps appreciate that with Capital they can use as much or as little of it as they need, and work up to the full system in their own time. For instance, Derek still keeps his worksheet and timesheet records manually, although there is no doubt that Capital can help. Overall, Derek feels Capital has increased his company's trading potential by giving him day-to-day financial control in a way not possible with a manual system.

■ Derek Crisp 01394 277111



Derek Crisp, director of PJ Trailer Services



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Editor's Choice

The criteria applied in assembling this selection of accounting software were suitability for small-to-medium businesses (a wide range) and ease of use (subjective). However, when selecting our recommendations, and keeping in mind those either new to computers or new to accounting, we also took into consideration the additional criterion of suitability for use by those *without professional accounting skills*. This instantly narrows the field, although not necessarily only to those programs usually thought of as being "entry level".

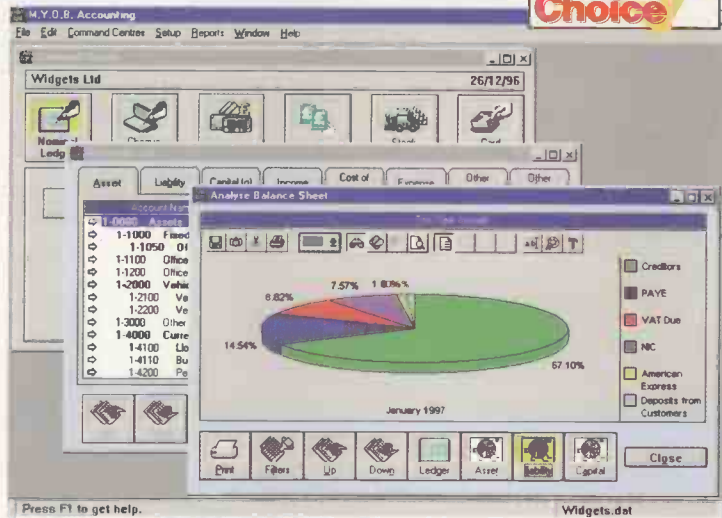
The best-selling small-business accounting software is QuickBooks and it's undoubtedly easy to use with a good range of facilities. For small businesses without manufacturing or manufactured stock complications, and especially for small service businesses, it remains a good choice. It has been a while, however, since it was upgraded and some of its later competitors are looking more versatile.

Two packages knocking at the door of Sage's Sterling, the most comprehensively featured software considered, are Capital by Pegasus and MAP's Pastel Accounting. Both include sales- and purchase-order processing, enabling users to computerise more aspects of their business than just the book-keeping. Partly because of this versatility, they are not, perhaps, suited to the absolute beginner without access to some hand-holding.

QuickBooks v3 and MAP Pastel Accounting are both Highly Commended, but our Editor's Choice is a program that is not only easy to get to grips with but also capable of considerable use

Right
M.Y.O.B., our Editor's Choice, offers unrivalled versatility

Below
Beginners could do worse than check out QuickBooks



before there's any likelihood of it being outgrown. For a sensible selection of accounting features coupled with its useful, though basic, contact management facilities, and certainly for the money, we recommend

M.Y.O.B. It does without sales-order processing but its pending invoices and its job management facility do almost as good a job. It will also prepare your estimates and manage your stock. You get a good range of analysis codes and user-definable credit control. It gives help with awkward transactions like reversing postings which can otherwise leave you in a horrendous tangle, and has reasonably priced telephone support. You can format its output, helping to make a good impression on your customers (and bank manager), and for input you can choose flowchart or menu navigation. The inclusion of basic contact management and its daily reminder list means that the only other software many small companies might need is a word processor.

Modular systems

If none of the integrated packages discussed here satisfy your requirements, you may need to consider a modular package. As the name implies, modular packages comprise several modules, each of which can be bought separately. This allows you to build up a software specification to suit your exact requirements with no redundant elements, and usually offers functions not available in the integrated software.

For many companies, changing up from a less sophisticated or manual system, modular packages offer a gradual way of easing into computerised accounts.

Another attraction is that modular software is usually better-specified in terms of features. There will be a more powerful analytical capacity, coupled with more flexible reporting options, so your accounts data yields more information not only as historical records but also as valuable management information.

Additionally, modular accounting packages are usually bought from VARs — Value Added Resellers, who have been trained by the publisher in all aspects of its software. This does mean, though, that the VAR probably only offers software from one publisher. It will probably also have access to the software's source programming, and will have experts on hand who are able to tailor it more closely to the peculiarities of your business. In some cases, you can have extra functions added just for you or for interfacing to your other systems. Many modular packages are capable of linking to industry-standard databases.

None of this comes cheap, of course, and the cost of individual modules may well exceed the total cost of an integrated package, pushing the price of modular software into the thousands of pounds rather than the hundreds. A typical modular system, with a central core of the three standard

ledgers — sales, purchase and general or nominal — together with Invoicing and a Cashbook, could set you back more than £2,500 for a single-user licence, rising to over £15,000 for multi-user capability.

Extra modules would start at about £500 each and might include stock control, bill of materials, sales- and purchase-order processing, costing, BACS, job costing and estimating, as well as an asset register. To that must be added the cost of training your staff and of maintaining your bespoke system, which is as unlikely to be bug-free as any other software.

You will probably discover that most upper-end software is DOS-based, for the reason that it is often in full-time use entering data where GUIs (graphical user interfaces) get in the way of professional and expert keyboard users. But there is an increasing number of packages being published as 32-bit Windows NT applications.

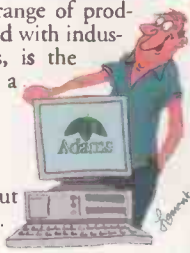
Table of Features					
Name	ABC4	Access Intro	Pegasus Capital	Sage Instant Accounting	Money Manager
Price	£293 (£249.36 ex VAT)	£347 (£295.31 ex VAT)	£646 (£549.78 ex VAT)	£99 (£84.25 ex VAT)	£94 (£80 ex VAT)
Nominal ledger	●	●	●	●	●
Sales ledger	●	●	●	●	●
Purchase ledger	●	●	●	●	●
Invoicing	●	£100	●	●	£50
Stock control	●	£100	●	○	with above
Sales order processing	£249	○	●	○	○
Purchase order processing	○	○	●	○	○
Job costing	○	£100	○	○	○
Payroll	£99	£200	○	○	○
Multi-company*	●	○	●	○	●
Multi-user	£351	£200	○	○	○
Multi-currency	○	●	○	○	●
Euro-ready	○	●	○	○	●
Year 2000-ready	○	●	●	○	●
Accreditation	○	BASDA/ICACW	ICAW	ICAEW	○
Initial support	Free	£120/12mths	Free/90days	Free/90days	Free
Extended support	Free	£120/12mths	£180/12mths	£75/12mths	Free
User club	●	○	○	○	○
Evaluation disk	○	○	○	○	○
Operating system	DOS	Win 3.1	Win 3.1	Win 3.1	DOS/Win 3.1
Min. memory	1Mb	6Mb	4Mb	4Mb	4Mb
Disk space	1Mb	10Mb	6Mb	10Mb	3Mb
Supplier	ABC Direct Sales	Access Accounting	Pegasus Software	Sage Group	Connect Software
Sales Tel:	01257 480502	01206 322575	01536 495200	0191 255 3000	0181 743 9792
Web address www	○	access-accounts.com	pegasus.co.uk	sagesoft.co.uk	○

Table of Features					
Name	MYOB v6	MAP Pastel Accounting	QuickBooks v3	Sterling Financial Controller	TAS Books 2
Price	£229 (£194.89 ex VAT)	£469 (£399.14 ex VAT)	£146 (£124.25 ex VAT)	£763 (£649.36 ex VAT)	£410 (£349 ex VAT)
Nominal ledger	●	●	●	●	●
Sales ledger	●	●	●	●	●
Purchase ledger	●	●	●	●	●
Invoicing	●	●	●	●	●
Stock control	●	●	●	●	●
Sales order processing	○	●	○	●	●
Purchase order processing	○	●	○	●	●
Job costing	●	○	○	○	○
Payroll	○	○	○	£300	£99
Multi-company	○	●	●	£149	£100
Multi-user	○	£299	○	£350	£150
Multi-currency	○	●	○	○	○
Euro-ready	○	○	○	○	○
Year 2000-ready	●	●	●	○	○
Accreditation	○	BASDA/ICAEW	○	ICAEW	ICAEW
Initial support	Free/30days	Free/30days	Free/60days	Free/90days	Free/90days
Extended support	£75/12mths	£150/12mths	£76/12mths	£240/12mths	£180/12mths
User club	○	○	○	○	○
Evaluation disk	○	£30	£4	○	○
Operating system	Win 3.1	Win 3.1	Win 3.1	DOS/Win 3.1	DOS
Min. memory	4Mb	8Mb	4Mb	4Mb	640Kb
Disk space	10Mb	18Mb	10Mb	10Mb	10Mb
Supplier	BestWare	MAP Computer Products	Intuit UK	Sage Group	Megatech Software
Sales Tel:	01752 201901	0161 624 5662	01932 578501	0191 255 3000	0181 874 6511
Web address www	○	pastel.co.za	ii.co.uk/intuit	sagesoft.co.uk	megatech.co.uk

Key: ● Yes ○ No

TOUGH

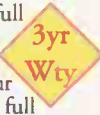
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Our three machine notebook range includes the Elite, a full multimedia notebook with CD and floppy drive co-existing. The Elite Slim, combines all the features of the Elite into a package weighing only 2.7kgs and in a super slim case. Ideal for the business man who wants all the features available in a briefcase sized package. Finally, Rocky the ruggedised water-resistant notebook, that's brilliant on-shore, off shore, down a mine, or by a race track to name but a few. Don't forget we offer 6 months interest free credit on most models, call now and find out more about the Adams difference, sales are waiting on 0161 282 8822.

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Rocky Pricing

Rocky Pentium 133, 9.5" mono VGA reflective LCD, 1.0gb HDD, with 16mb RAM	£2399 (+ VAT)
Rocky Pentium 133, 10.4" "sunblind" TFT SVGA LCD, 1.0gb HDD, with 16mb RAM	£2999 (+ VAT)
HDD upgrade from 1.0gb to 1.3gb	£195
Memory upgrade to 24mb	£195
Memory upgrade to 32mb	£395
Internal fax/modem 28800	£239
12v car power adaptor	£59
External Battery	£95

Specification

- Intel Pentium® 133mhz CPU
- Local bus with 64 bit memory addressing
- Ruggedised to American Military standard 810E
- EMI spec: MIL-STD-461C
- 16mb standard memory upgradeable to 32mb
- 1gb 2.5" shock resistant hard drive upgradeable to 1.3gb
- 9.5" mono trans-reflective (viewable in bright sunlight) VGA LCD (64 grey levels) or 10.4" TFT SVGA LCD's, 65,000 colours, 800 x 600 resolution
- 64 bit local bus graphics accelerator giving notebook resolution of 800 x 600 (TFT) and external monitor display up to 1024 x 768
- External 1.44mb floppy drive connects to parallel port
- 16 bit stereo sound with built in stereo speakers
- BIOS controlled power management
- LED status panel
- Intuitive front mounted waterproof pointing device
- Type II PC Card slot (2 x type II)
- High capacity NiMH battery
- Up to 2 hours battery life (with power management)
- IrDA Infrared Port (HP compatible)
- 2 enhanced serial port, 1 EPP parallel port, external CRT port, audio connectors
- 81 key UK keyboard
- Full security with password protection
- Multi voltage 110-240v charger / power supply
- Weight 2.9kgs with hard drive and battery
- 1 year parts and labour warranty
- MS Windows 95
- Tel-Me business information software pre-loaded
- Rocky Toughware case included



Adams notebooks and PC's help Williams Renault to victory in 1995 and 1996 - We're off to battle again in 1997 when Rocky joins the fray as well!

Powerful & waferly slim

Specification

- Intel Pentium® 133 or 150mhz CPU's
- 256k pipeline burst cache
- PCI local bus with 64 bit memory addressing
- 16mb standard memory upgradeable to 40mb
- Quick removable 1gb 2.5" EIDE PCI local bus hard drive upgradeable to 2.0gb
- 11.3" SVGA DSTN LCD 256 colours, and 11.8" or 12.1" TFT SVGA LCD's, 65,000 colours, all LCD's with 800 x 600 resolution
- PCI 64 bit local bus graphics accelerator giving notebook resolution of 800 x 600 and external monitor display up to 1024 x 768
- Software MPEG-1 playback with DCI support, **ZV Port**
- 1.44mb floppy drive built in
- 16 bit stereo sound card
- Built in stereo speakers and microphone
- Standard eight speed CD-ROM co exists with floppy drive
- BIOS and Microsoft APM compatible power management
- LCD status panel
- Intuitive front mounted trackpad pointing device
- Type III PC Card slot (Takes 1 x type III or 2 x type II)
- Extra high capacity NiMH battery, smart with gas gauge
- Up to 2 - 3 hours battery life (with power management)
- TV port (composite video)
- IrDA Infrared Port (HP compatible)
- 1 enhanced serial port, 1 EPP parallel port, external CRT port, game port, external keyboard port, audio connectors
- Windows 95 UK keyboard
- Full security with password protection and Kensington lock support
- Multi voltage 110-240v charger / power supply
- Weight 3.2kgs/2.7kgs with hard drive and battery
- 1 year parts and labour warranty
- Windows 95 preloaded and on CD
- Tel-Me business information software pre-loaded
- Accura Elite case included

Elite & Elite Slim from £1349



The Accura Elite and Elite Slim are made by one of the world's largest notebook manufacturers, giving big name brand quality without the high price. Both machines are constructed to a similar specification, with the main difference being the Slim having an interchangeable CD-ROM and FDD making the machine only 42mm thick and 2.7kg. Our new Elite 2 offers more internal features in the same case, up to 48mb RAM, 166mhz CPU support and now a 12.1" DSTN. More next month. Call for more details and pricing on the new Elite 2.

Standard specification includes up to 12.1" SVGA TFT, Intel Pentium from 133 through to 150mhz, 3.3v down to 2.5v as available. Pipeline burst cache, standard eight speed CD-ROM, floppy drive, heat pipe cooling system so no fan noise. Software MPEG with DCI support, TV port, smart battery with gas gauge, 1.0gb hard drive, fast IR port, fully Windows 95 APM compliant. Plug 'n Play compatible, Windows 95 keyboard. Kensington lock, removable hard drive, LCD status display. Interested? Call 0161 282 8822 for latest information and prices.

Notebooks that are amazingly

VERSATILE

Elite Options

Memory upgrade to 24mb	£80
Memory upgrade to 40mb	£240
Hard drive upgrade from 1.0gb to 1.3gb	£89
Hard drive upgrade from 1.0gb to 2.0gb	£229
PC Card Fax / Modem 33600	£169
PC Card ethernet adaptor (UTP and Coax)	£99
PC Card SCSI adaptor	£169
PC Card GSM Option Card	£399
Mini Dock	£275
Car power adaptor	£49
Spare Ni Mh battery	£89
Second 110/240 autoswitching AC PSU	£59
3 year parts and labour warranty	£CALL
Vision 3 year parts, labour & accidental damage wty	£CALL
MS Office 95 Professional with Bookshelf (CD) (must be purchased with notebook)	£199
Microsoft Encarta 97 (CD)	£35
Microsoft Works V4.0 (CD)	£35
Aiwa CPC77 powered speakers	£49



Common specifications listed in black, Elite specific in green and Elite Slim specific in red.

CPU	11.3" LCD DSTN	11.8" TFT	12.1" TFT
133mhz	£1349 (1585.08)	£1729 (2031.58)	£1829 (2149.08)
150mhz	£1399 (1643.83)	£1799 (2113.83)	£1879 (2207.84)

0161 282 8822

The best special offers!

HOT



Offers

Family Internet

Performance home multimedia internet

- IBM 6x86 P166+ CPU
- Intel 430VX based motherboard
- 256k pipeline burst cache
- 16mb EDO RAM
- 1.2gb EIDE hard drive
- 1.44mb floppy drive
- x12 speed EIDE CD-ROM
- 16 bit PNP soundcard and speakers
- 64 bit S3 graphics card with 1mb DRAM
- 14" Accuscan monitor, 1024x768, max r/f 72hz
- 33,600 internal f/modem with internet software
- Windows 95 keyboard
- Microsoft Mouse
- Adams quality injection moulded, stainless steel lined desktop case
- Windows 95 (preloaded and on CD)
- MS Works (CD)
- MS Encarta 97 (CD)
- 3 year parts and labour warranty (1st year on site)

Only £199 Deposit

Pay the balance of £1004.20 in 6 months, 0% APR

Premium Internet

Highly specified home multimedia internet

- IBM 6x86 P200+ CPU
- Intel 430VX based motherboard
- 512k pipeline burst cache
- 16mb EDO RAM
- 2.0gb EIDE hard drive
- 1.44mb floppy drive
- x12 speed EIDE CD-ROM
- 16 bit PNP soundcard with quality powered speakers
- Matrox Mystique 3D graphics card, 2mb SGRAM
- 15" Accuscan monitor, 1280x1024, max r/f 72hz
- 33,600 internal f/modem with internet software
- Windows 95 keyboard
- Microsoft Mouse
- Adams quality injection moulded, stainless steel lined desktop case
- Windows 95 (preloaded and on CD)
- MS Office 95 (CD)
- MS Encarta 97 (CD)
- 3 year parts and labour warranty (1st year on site)

Only £249 Deposit

Pay the balance of £1365.45 in 6 months, 0% APR

Multimedia Internet

Top of the range home multimedia internet

- IBM 6x86 P200+ CPU
- Intel 430VX based motherboard
- 512k pipeline burst cache
- 16mb EDO RAM
- 2.5gb EIDE hard drive
- 1.44mb floppy drive
- x12 speed EIDE CD-ROM
- Creative Labs Soundblaster 16PNP
- Aiwa 20w RMS speakers with sub woofer
- Matrox Mystique 3D graphics card, 2mb SGRAM
- 17" Accuscan monitor, 1280 x 1024, max r/f 75hz
- 33,600 internal f/modem with internet software
- Windows 95 keyboard
- Microsoft Mouse
- Adams quality injection moulded, stainless steel lined desktop case
- Windows 95 (preloaded and on CD)
- MS Office 95 (CD)
- MS Encarta 97 (CD)
- 3 year parts and labour warranty (1st year on site)

Only £299 Deposit

Pay the balance of £1491.70 in 6 months, 0% APR

Finance Example

Cash price £999 + £25 carr + VAT = £1203.20

Pay the £199 deposit with order and pay the balance of £1004.20 6 months later. APR 0%. Subject to status, written details available.

Finance Example

Cash price £1349 + £25 carr + VAT = £1614.45

Pay the £249 deposit with order and pay the balance of £1365.45 6 months later. APR 0%. Subject to status, written details available.

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Cash price £1499 + £25 carr + VAT = £1790.70

Pay the £249 deposit with order and pay the balance of £1491.70 6 months later. APR 0%. Subject to status, written details available.

Pentium Pro RAID Servers - Constant data on stream



I-RAID

- Intel Pentium Pro 180/200mhz CPU (single CPU installed)
- Std dual or CPU card based motherboard
- 256k on CPU cache
- 64mb RAM
- 3 channel bus mastering, PCI RAID fast wide SCSI-II controller with 8mb cache. Max burst data transfer as configured 50-60mb/s
- 4.0gb addressable RAID level 5 array, with 3 x 2gb fast wide SCSI-II hard drives, mounted on alloy "hot plug-gable" mounts.
- 8 speed SCSI CD-ROM with SCSI controller
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan Monitor, max res 1024 x 768, max r/f 72hz
- 2 serial, 1 parallel port
- 32 bit 100mbps PCI bus mastering ethernet card
- Accura Integrated Server case with 2 x 400W redundant power supplies and 1 x 400W pluggable spare.
- Power supply failure alarm
- Accutouch heavy duty keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Windows NT 4 (5 user licence)

Integrated RAID pricing (1CPU installed)

Model	Dual P-Pro	CPU Card
Pentium Pro 180	£5999	£6199
Pentium Pro 200	£6148	£6348

Call tech sales for a quotation on

RAID servers have an 8 hour response time on site maintenance cover. Shorter response times are available and are subject to quotation.

Adams are here to serve you. Our servers are ready and willing to dish out information continuously, as and when you need it, night and day. Our powerful Modu-RAID and Integ-RAID are unique in providing some of the most powerful quality solutions around at a very inexpensive price.

All Adams servers now feature either single or dual Pentium Pro motherboards. These provide maximum performance for minimum cost. On the Integrated RAID we offer the choice of either a standard dual Pentium Pro motherboard or a CPU card based motherboard allowing many more expansion options.

The Modu-RAID offers a "building block" style external disc array, providing the ability to upgrade your server as requirements dictate, from a 3 disc RAID upwards, even peripherals like DAT, can be added to the external block if required.

Accura Integ-RAID gives a traditional server layout, with up to 6 removable drives integrated into the case. Features include a redundant power supply system with "quick change" spare, a high efficiency cooling system and the ability to integrate further peripherals like DAT, CD-ROM and optical drives. The Accura Integ-RAID is one of the most cost effective high performance server systems available.

Our Pro Servers are designed with the small work-group in mind, with either single or dual Pentium Pro 180's or 200's. For more information call sales.



M-RAID

- Intel Pentium Pro 180/200 CPU
- Single or dual CPU motherboard (1 CPU Installed)
- Intel Natoma 440FX chipset
- 256k on CPU cache
- 32mb RAM
- Modular expandable RAID enclosure with redundant PSU's
- 4.0gb addressable RAID level 5 array, with 3 x 2gb fast SCSI-II hard drives
- DPT PCI 32-bit bus mastering RAID controller with 4mb cache memory
- 8 speed SCSI CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial (16550), 1 parallel port (EPP/ECP)
- 32 bit 100mbps PCI bus mastering ethernet card
- Accura tower case with 200w PSU
- Accutouch heavy duty keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Windows NT 4.0 (5 user licence)

Modular RAID pricing (1CPU installed)

Model	P-Pro	Dual P-Pro
Pentium Pro 180	£3999	£4249
Pentium Pro 200	£4148	£4398

0161 282 8822

RAID servers are normally built within 7-10days. Please check delivery time before ordering. All RAID server prices are quoted exclusive of VAT. E & OE

6x86 & Pentium Pro Power Machines

Accura E

Everything in one value for money system

- IBM 6x86 166+ or 200+ CPU
- Intel 430VX based m/b with 512k pipeline burst cache
- 16mb EDO RAM
- 2.0gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- 16 bit sound card (speakers optional)
- S3 64bit PCI graphics card with 1mb DRAM
- 15" Accuscan, 1280 x 1024, 72hz
- Accura desktop case with 200w PSU
- Windows 95 keyboard
- Microsoft Mouse
- 3 year parts and labour warranty (1st year on site)
- MS Windows 95 (preloaded and on CD)
- MS Works for Windows 95 (CD)
- Tel-me business information software (preloaded)

Accura E 166+ £949 (1115.08)
Accura E 200+ £1049 (1232.58)

P-Pro

Performance Pentium Pro machine

- Intel Pentium Pro 180 or 200 mhz CPU
- 256k CPU cache
- Intel 440FX (Natoma) based motherboard
- 32mb EDO RAM
- 3.2gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- 16 bit sound card (speakers optional)
- Matrox Mystique 3D graphics card, 2mb SGRAM
- 15" Accuscan, 1280 x 1024, 72hz
- Accura lower case with 200w PSU
- Windows 95 keyboard
- Microsoft Mouse
- 3 year parts and labour warranty (1st year on site)
- MS Windows NT 4.0 (preloaded and on CD)
- MS Office 95 (CD)
- Tel-me business information software (preloaded)

P-Pro 180 £1699 (1996.33)
P-Pro 200 £1829 (2149.08)

POWER



M/Media

Top end multimedia for the home or office

- IBM 6x86 200+ CPU
- Intel 430VX based motherboard
- 512k pipeline burst cache
- 32mb EDO RAM
- 3.2gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- Creative Labs Soundblaster 32PNP
- Aiwa CPC77 powered speakers
- Matrox Mystique 3D graphics card, 2mb SGRAM
- 17" Accuscan, 1280 x 1024, 72hz
- Accura desktop case with 200w PSU
- Windows 95 keyboard
- Microsoft Mouse
- 3 year parts and labour warranty (1st year on site)
- MS Windows 95 (preloaded and on CD)
- MS Office Pro 95 with MS Bookshelf
- Tel-me business information software (preloaded)

M/Media 200+ £1649 (1937.58)

Dual-Pro

Dual Pentium Pro power

- Intel Pentium Pro Processor 200mhz (one CPU fitted)
- 256k CPU cache
- Intel 440FX (Natoma) based dual P-Pro motherboard
- 64mb EDO RAM
- 4.0gb UW SCSI hard drive
- 32 bit UW SCSI controller
- x12 speed EIDE CD-ROM
- 3.5" 1.44mb FDD
- Creative Labs Soundblaster AWE64
- Aiwa speaker system with subwoofer
- Matrox Millennium graphics card, 4mb WRAM
- 17" Accuscan, 1280 x 1024, 72hz
- Accura tower case with 200w PSU
- Windows 95 keyboard
- Microsoft Mouse
- 3 year parts and labour warranty (1st year on site)
- MS Windows NT 4.0 (preloaded and on CD)
- MS Office Professional 95 with MS Bookshelf (CD)
- Tel-me business information software (preloaded)

Dual-Pro 200 £2999 (3523.63)

Accura Options

EDO Memory upgrade from 16mb to 32mb	£80
EDO Memory upgrade from 32mb to 64mb	£160
Matrox Mystique 2mb to 4mb SGRAM	£59
15" Accuscan to 17" Accuscan monitor	£199
17" Accuscan to 17" Iiyama VM-Pro	£139
Seagate 3.2gb internal Travan tape streamer	£199
Yamaha M20 powered speakers	£59
Aiwa powered speaker/subwoofer system	£79
Internal 33.6 Fax/modem	£89
32 bit 10mbps PCI network card	£39

Next working day delivery on certain systems



Adams are the official suppliers to Williams Renault for 1997

MMX



now with new Intel TX core logic

Accura M

Speed freaks first machine!

- Intel 166mhz Pentium Processor with MMX technology
- Intel 430VX based m/b with 512k pipeline burst cache
- 32mb EDO RAM
- 2.0gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- 16 bit sound card (speakers optional)
- 64bit S3 based 64 bit graphics card with 2mb DRAM
- 15" Accuscan, 1280 x 1024, 72hz
- Accura lower case with 200w PSU
- Windows 95 keyboard
- Microsoft Mouse
- 3 year parts and labour warranty (1st year on site)
- MS Windows 95 (preloaded and on CD)
- MS Office 95 (CD)
- Tel-me business information software (preloaded)

M-Pro 166 £1299 (1526.33)

M Options

EDO Memory upgrade from 16mb to 32mb	£80
SDRAM Memory upgrade from 32mb to 64mb	£179
Matrox Mystique 2mb to 4mb SGRAM	£59
Matrox Millennium 4mb - 8mb WRAM	£139
15" Accuscan to 17" Accuscan monitor	£199
17" Accuscan to 17" Iiyama VM Pro	£139
17" Iiyama VM Pro to 21" Iiyama VM Pro	£539
Yamaha M20 powered speakers	£59
Aiwa powered speaker/subwoofer system	£79
Internal 33.6 Fax/modem	£85
32 bit 100mbps PCI network card	£89

M-Pro

Serious speed freaks apply here

- Intel 200mhz Pentium Processor with MMX technology
- New Intel 430TX based ATX motherboard
- 512k pipeline burst cache
- 32mb SDRAM
- 3.2gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- 16 bit sound card (speakers optional)
- Matrox Mystique 3D graphics card, 2mb SGRAM
- 15" Accuscan, 1280 x 1024, 72hz
- Accura ATX tower case with 235w PSU
- Heavy duty Accutouch Windows 95 keyboard
- Microsoft Mouse
- 2 USB (universal serial bus) ports*
- 3 year parts and labour warranty (1st year on site)
- MS Windows 95 (preloaded and on CD)
- MS Office Professional 97 (CD)
- MS Bookshelf (CD)
- Tel-me business information software (preloaded)

M-Pro 200 £1649 (1937.58)

MMM-Pro

The ultimate multimedia performance solution

- Intel 200mhz Pentium Processor with MMX technology
- New Intel 430TX based ATX motherboard
- 512k pipeline burst cache
- 32mb SDRAM
- 3.2gb EIDE hard drive
- x12 speed CD-ROM
- 3.5" 1.44mb FDD
- Creative Labs Sound Blaster AWE 64
- AIWA speaker and subwoofer system
- Matrox Millennium with 4mb WRAM
- 17" Accuscan, 1280 x 1024, 72hz
- Accura ATX tower case with 235w PSU
- Heavy duty Accutouch Windows 95 keyboard
- Microsoft Mouse
- 2 USB (universal serial bus) ports*
- 3 year parts and labour warranty (1st year on site)
- MS Windows 95 (preloaded and on CD)
- MS Office Professional 97 (CD)
- MS Bookshelf (CD)
- Tel-me business information software (preloaded)

MMM-Pro 200 £1999 (2348.83)

Ordering & Delivery

Please call Sales on 0161 282 8822 to check latest pricing and availability. Machines marked with "24 Hour" are pre-assembled and tested ready for shipping next working day. Other PC's and Servers are built to order and will be shipped within 7-10 days. Notebooks are delivered within 2-3 days. Carriage; PC's £20-30, Notebooks £15. All prices are subject to VAT (prices in brackets include VAT). E & OE.



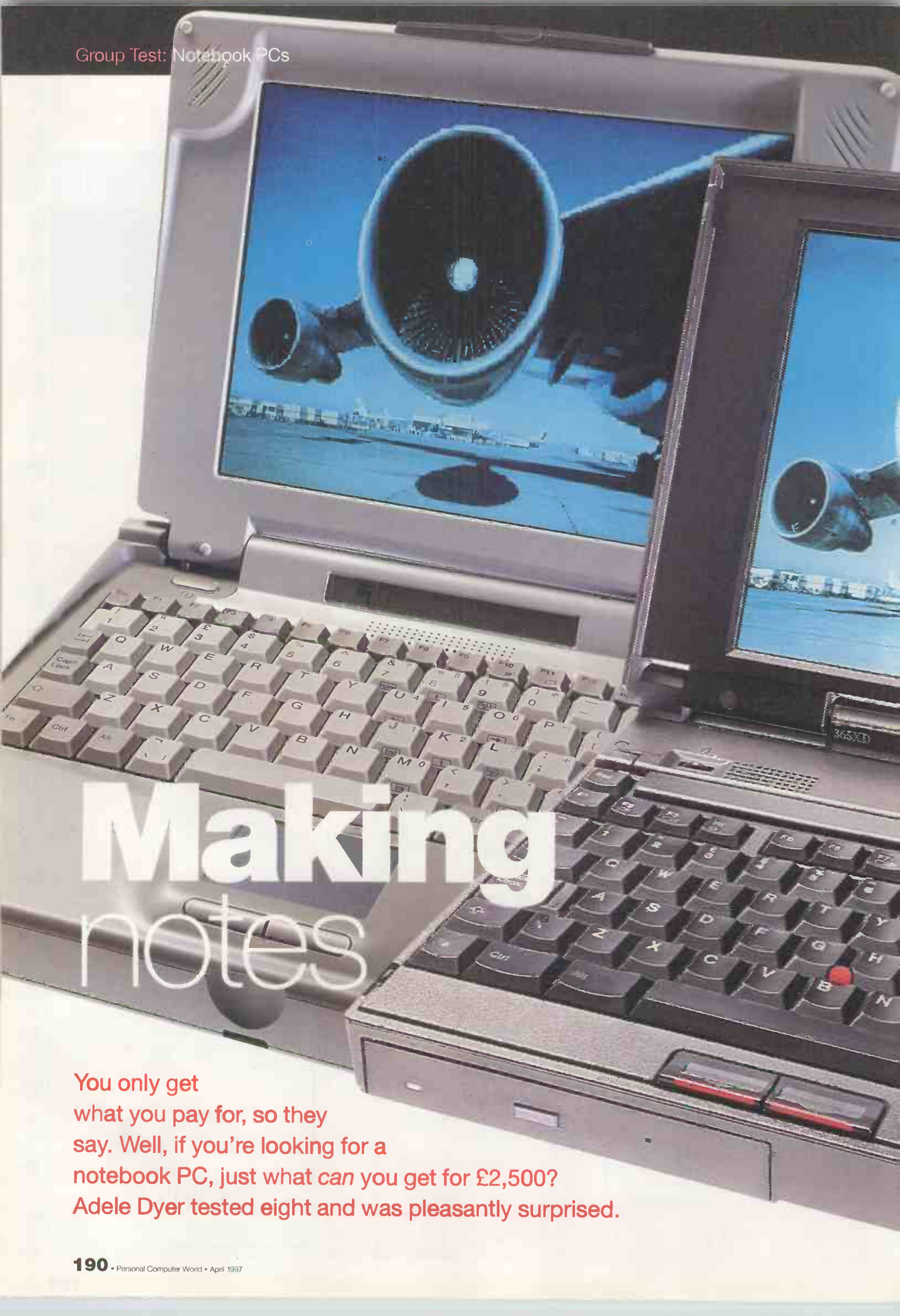
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One number does it all! 0161 282 8822

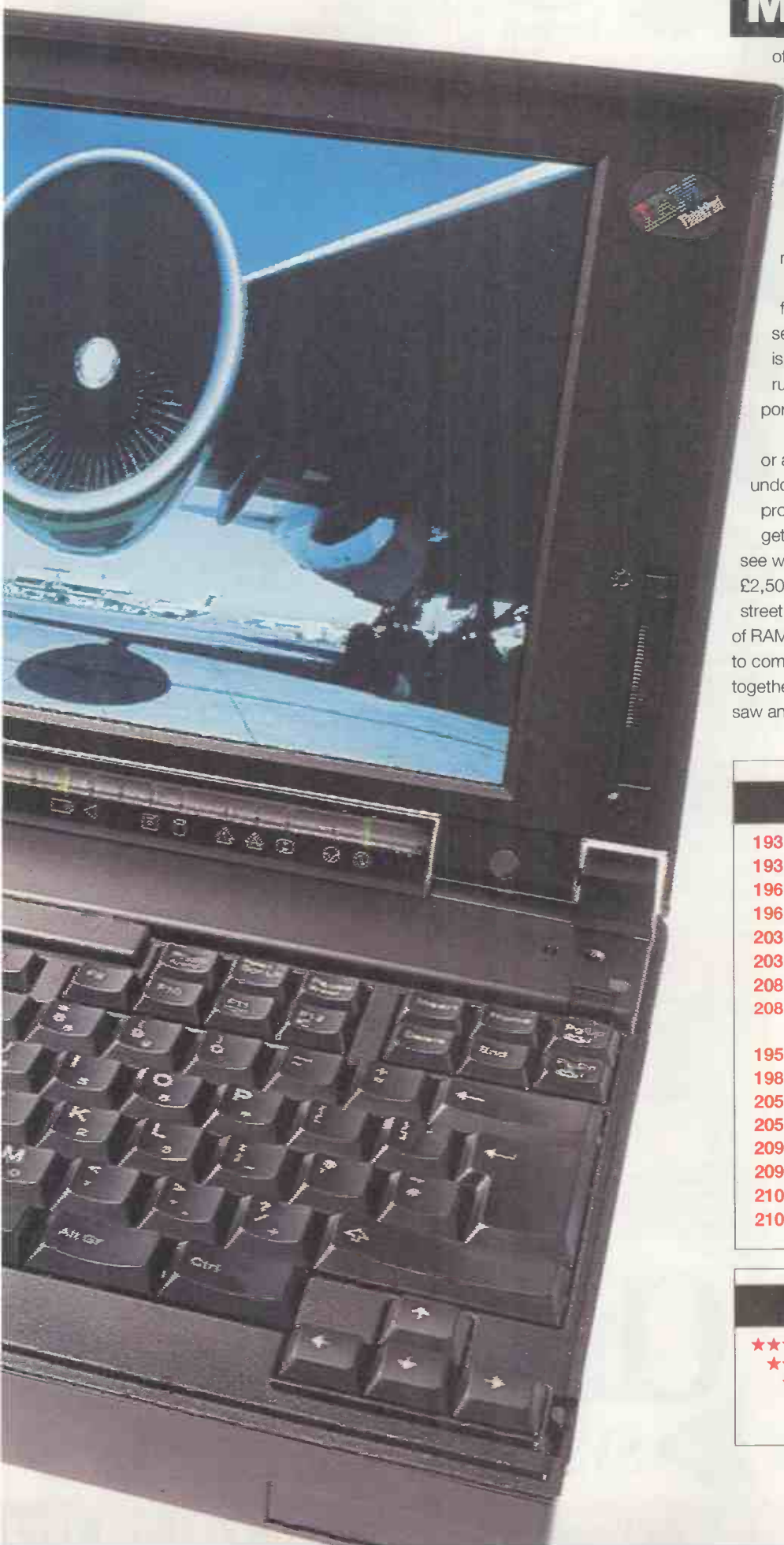
*USB ports need a new version of Windows 95 for full functionality

*6 months interest free credit subject to status, written details available. E & OE



Making notes

You only get what you pay for, so they say. Well, if you're looking for a notebook PC, just what *can* you get for £2,500? Adele Dyer tested eight and was pleasantly surprised.



Mobile computing is facing a real dilemma. Are notebooks here to stay, or are they likely to be swept away with the advent of Windows CE on the latest crop of PDAs? Are PDAs with their small size and light weight the way ahead, even though they offer limited computing power and are hell to type on? Or will PDAs, in turn, simply become internet machines and glorified mobile phones? Or, at the other end of the scale, are fully-featured, full-power MMX notebooks the way of the future?

The answer is probably that there is scope for all these machines in the market as they all serve very different needs. The large notebook is still useful for a few things: presentations, running power-hungry applications, or as a portable alternative to a desktop machine.

Whether you opt for a lightweight notebook or a fully-featured desktop replacement, price is undoubtedly the limiting factor in the decision process. If you have £5,000 to spare you can get some amazing machines, but we decided to see what we could get for a more reasonable £2,500. We specified that this figure should be a street price and exclude VAT. We insisted on 16Mb of RAM but left it to the manufacturers themselves to come up with the best deal they could put together. We were impressed with the machines we saw and think you, too, will be.

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Ratings

- ★★★★★ Buy while stocks last
- ★★★★ Great buy
- ★★★ Good buy
- ★★ There's a better buy somewhere
- ★ Buy it and weep



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- DURACELL BATTERY
- EPP/UART 16550 SERIAL PORTS
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- PCMCIA TYPE 2/3 SLOTS
- SVGA SCREEN
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- PLUG & PLAY
- 12 MONTHS ON-SITE WARRANTY
- WINDOWS '95 READY

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On selected models only. Please call for details.

• PC card slots (two type II or one type III)

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• Removable HDD module

• Standard Duracell DR-36 Ni-MH battery

• 12.1" & 11.3" large colour LCD screen (Detachable & Upgradeable)

• Full sized keyboard

• Removable FDD module

• Removable 4x speed CD-Rom module

Model	11.3 Dual scan		11.4 TFT colour	
	Ex VAT	Inc VAT	Ex VAT	Inc VAT
Intel P120	£1549	£1820.08	£1799	£2113.83
Intel P133	£1575	£1850.63	£1825	£2144.38
Intel P166	£1699	£1996.35	£1949	£2290.08
Intel P200	£1825	£2144.38	£2075	£2438.13
32Mb RAM add	£120		(£141.00 inc V.A.T)	
2.1Gb Hard disk drive	£179		(£210.33 inc VAT)	
12.1" TFT screen add	£225		(£264.38 inc VAT)	
12.1" dual scan add	£50		(£58.75 inc VAT)	

CHOICE ULTRALIGHT 2000 NOTEBOOK PC



- 13.3 XGA TFT Screen (1024 x 768 res 65K colours)
- Intel Pentium 150 or MMX 166/200
- 512K cache as standard
- 32Mb RAM (max 80Mb)
- 33.6 Internal fax modem
- 16 bit wavetable sound card+speakers
- 10 speed cd drive (removable)
- 2.1 gig HDD (removable)
- video capture on board
- 2Mb PCI VRAM graphic card
- PCMCIA type 2/3 with Zoom video
- Lithium ION battery
- 2Kgs or 6.3lbs weight

- Infra red / serial / parallel
- Touch pad / carry case
- MS Windows 95 on CD
- 2 years warranty (1st year parts & labour 2nd year labour only)
- 24 hour on line web support
- Business user over 3 years £29 per week
- Six months interest free option

P150 £3299 £3876.33 Inc VAT
MMX P166 £CALL
MMX P200 £CALL

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PCMCIA Serial card	£125	(£146.88 inc VAT)
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TDK Global Networker	£229	(£269 inc VAT)
PSION Gold Card GSM	£249	(£292.58 inc VAT)
PCMCIA 540Mb HDD	£CALL	
PCMCIA SCSI card	£CALL	
PCMCIA Fiber Optics Card	£349	(£410.08 inc VAT)
850Mb HDD	£65	(£76.38 inc VAT)
1Gb HDD	£175	(£205.63 inc VAT)
1.3Gb HDD	£199	(£233.83 inc VAT)
2Gb HDD	£CALL	
2.3Gb HDD	£CALL	
Free Spirit Modem + GSM	£289	(£339.58 inc VAT)
Lan & modem combo	£299	(£351.33 inc VAT)
New Media SCSI2 & 16 bit sound in one	£375	(£440.63 inc VAT)
Video Capture	£299	(£351.33 inc VAT)
Use your PCMCIA on your PC - cardmaster	£89	(£104.58 inc VAT)
260Mb HDD	£299	(£351.33 inc VAT)

FINANCE

BUSINESS USER,

LIMITED COMPANY OR SOLE TRADER:

Total value system £1549 + VAT (£1820.08 inc VAT)
 Leased over 3 years @ £13 + VAT paid direct debit quarterly

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Total value system £1549 + VAT (£1820.08 inc VAT)
 10% deposit = £182.00 / £1638.07 financed over 24 months 19.9% £82.07 paid monthly by direct debit 24 months APR 19.9% or settle everything within six months and pay no interest.

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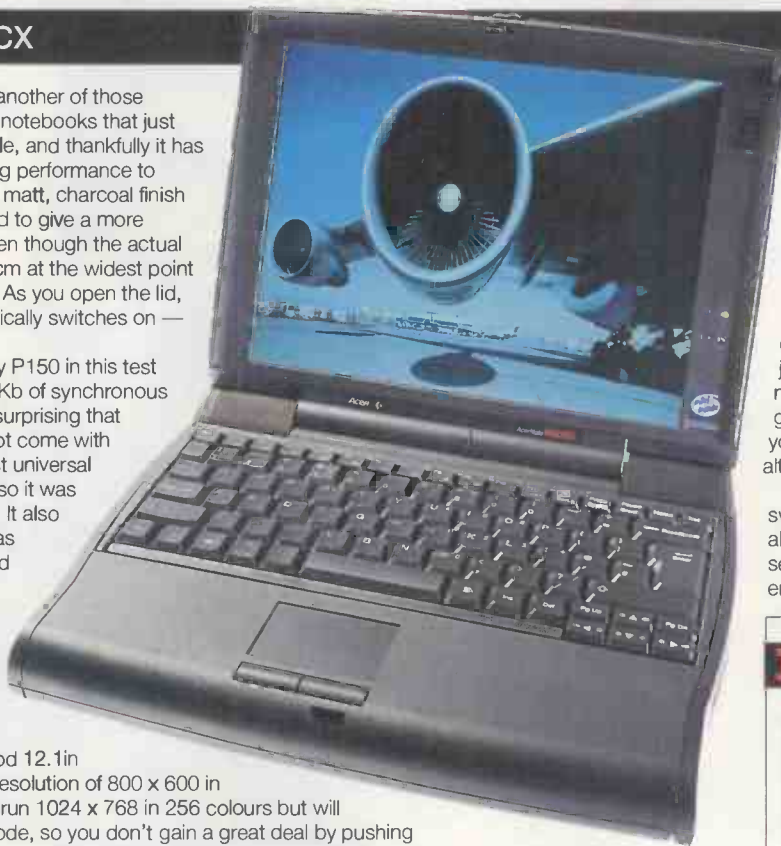
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AcerNote 970CX

The Acer is another of those "show-off" notebooks that just scream style, and thankfully it has a screaming performance to match. It has a grainy, matt, charcoal finish and the front is tapered to give a more svelte appearance, even though the actual measurement of 30.7cm at the widest point belies this impression. As you open the lid, the notebook automatically switches on — quite a novelty.

The Acer is the only P150 in this test and benefits from 256Kb of synchronous SRAM L2 cache. It is surprising that more notebooks do not come with cache since it is almost universal in desktop machines, so it was pleasing to see it here. It also has 16Mb EDO RAM as standard, a 1.3Gb hard disk and the exceptionally fast NeoMagic 128-bit graphics chip, all of which boost the machine's performance results.

The screen is a good 12.1in TFT with a maximum resolution of 800 x 600 in 65,000 colours. It can run 1024 x 768 in 256 colours but will only do so in virtual mode, so you don't gain a great deal by pushing up to this mode. The colours are vibrant, and overall the screen is steady and even.



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The keyboard is pleasant to use, with exactly the right amount of spring-back, and it can be tilted to a more comfortable typing position. The glidepad was not such a delight, however it was configured. It was sticky and jerky at best and a downright nuisance at worst. There is, thank goodness, a Windows 95 key so you can circumvent the glidepad altogether.

The CD-ROM drive can be swapped with the floppy drive or alternatively they can be run off a separate extension cable, enabling you to use both at once.

PCW Details

Price RRP £3,149 (£2,680 ex VAT).
Street £2,812 (£2,393.19 ex VAT)
Contact Acer UK 01628 533422
Good Points Great design. Excellent performance.
Bad Points Jerky glidepad.
Conclusion An excellent little mover.

★★★★★

Brother Expression

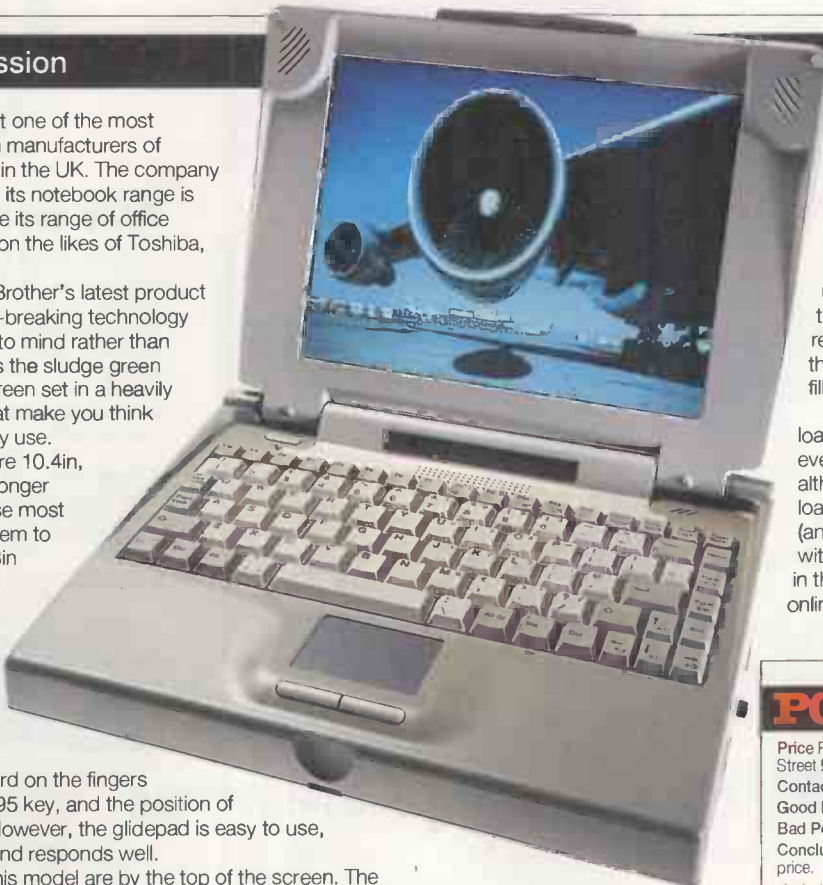
Brother is not one of the most well-known manufacturers of notebooks in the UK. The company admits that its notebook range is there more to complete its range of office products than to take on the likes of Toshiba, Compaq and IBM.

The Expression is Brother's latest product but there is no ground-breaking technology here: "sturdy" springs to mind rather than "exciting". Perhaps it is the sludge green colour, or the small screen set in a heavily moulded surround, that make you think it is intended for military use.

The screen is a mere 10.4in, something we are no longer used to seeing because most manufacturers now seem to opt for at least an 11.3in screen except on their lowest-priced models. The screen quality was disappointingly average, being a little dull and lacking pizzazz.

The keyboard is hard on the fingers and has no Windows 95 key, and the position of the keys is not ideal. However, the glidepad is easy to use, smooth to the touch and responds well.

The speakers on this model are by the top of the screen. The sound is not superb, although it is simply muffled rather than tinny as



on many other notebooks on the market.

The CD and floppy drive are interchangeable and slide in and out easily enough, although you will need both hands to undo the catch. The hard disk is removable, but both slots on the bottom of the case are filled.

There are no useful utilities loaded on the Expression, not even for power management, although you do get a pre-loaded copy of SmartSuite (and on disk, too). Again, as with almost all the notebooks in this test, there is a bundle of online services ready to set up.

PCW Details

Price RRP £2,274 (£1,935.31 ex VAT).
Street £1,985 (£1,689.36 ex VAT)
Contact Kyodai 01279 416888
Good Points Solid and robust.
Bad Points No utilities. Screen a little dull.
Conclusion A solid notebook at a decent price.

★★★

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- Docking station port
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- Optional docking station
- Optional car adapter available
- Weight - 7.1 lb
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- Approvals - CE/FCC/VCCI/UL/CSA



24 MB RAM

1.4 GB HDD

6 Speed CD-ROM

11.3" Screen

TV out port

ZV port



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	ULTRA 86-150 Pentium® 150 MHz Chip		ULTRA 86-166 Pentium® 166 MHz Chip	
	£ ex. VAT	£ inc. VAT	£ ex. VAT	£ inc. VAT
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1.4 GB HDD				
11.3" screen				
D Dual scan colour	1325.00	1556.88	1425.00	1674.38
T TFT active colour	1575.00	1850.63	1675.00	1968.13



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Table of Features				
Manufacturer	Acer UK	Brother	Evesham Micros	IBM
Model name	AcerNote 970CX	Expression (133 10.4)	Vale Quest	ThinkPad 365XD
Tel no.	01628 533422	01279 416888	01386 765500	0990 727272
Price - RRP	£3,149 (£2,680 ex VAT)	£2,274 (£1,935.31 ex VAT)	£2,277 (£1,937.87 ex VAT)	£ 2,412 (£2,052.76 ex VAT)
Price - Street	£ 2,812 (£2,393.19 ex VAT)	£ 1,985 (£1,689.36 ex VAT)	Direct only	£ 2,190 (£1,863.82 ex VAT)
Processor	Intel Pentium 150	Intel Pentium 133	Intel Pentium 133	Intel Pentium 120
RAM supplied as standard	16Mb EDO	8Mb EDO	8Mb EDO	8Mb EDO
Maximum RAM	64Mb EDO	40Mb EDO	40Mb EDO	40Mb EDO
L2 cache	256Kb Sync SRAM	256Kb pipeline burst	256Kb pipeline burst	N/A
Hard disk size	1.35Gb	1.3Gb	1Gb	810Mb
Swappable components	CDD, FDD	CDD, FDD	N/A	n/a
CD-ROM speed	6X	10X	6X	4X
CardBus supported?	○	●	○	●
Zoomed Video supported?	○	○	○	○
Video memory size and type	1.1Mb EDO DRAM	1Mb VRAM	1Mb EDO	1Mb VRAM
Pointer type	Touchpad	Glidepad	Touchpad	Trackpoint
Sound enhancement technology	○	○	○	FM Synthesis
IrDA	● (v1.0)	● (v1.0)	● (v1.0)	● (v1.0)
Screen size & technology	12.1in TFT	10.4in TFT	11.3in TFT	10.4in TFT
Maximum resolution	800 x 600	800 x 600	800 x 600	800 x 600
On-screen colours (800 x 600)	65K	65K	65K	256
Battery type supplied/claimed life	Li -Ion/10 hrs	NiMH/1.5 hrs	NiMH/2 hrs	NiMH/2 hrs
Dimensions (WxDxH) in mm	313 x 240 x 53	292 x 230 x 55	297 x 236 x 35 (nb only)	297 x 211 x 49
Weight with battery	4.2kg	3kg	2.5kg (nb only)	2.92kg
Software bundle	Win95, MPEG player	Win95, SmartSuite 96	○	Lotus SmartSuite
Basic warranty	1 yr swap-out	1 yr RTB	1 yr	1 yr
Warranty options	Max 2 yr extension	1, 2, 3 yrs on-site	1, 2, or 4 yrs	1, 3, 5 yr extensions
Technical support	National rate (0990 134348)	National rate (01279 410330)	National rate	24 hrs Helpware membership

Table of Features				
Manufacturer	Opti International	Samsung	Sharp	Toshiba
Model name	Calbre Plus	Sens Pro 500	PC-9040	Satellite Pro 430CDT
Tel no.	0181 507 1818	0181 391 0168	0800 262958	01932 828828
Price - RRP	£1,927 (£1,640 ex VAT)	£2,932 (£2,495.31 ex VAT)	£2,701 (£2,298.72 ex VAT)	£3,167 (£2,695.31 ex VAT)
Price - Street	Direct only	£2,697 (£2,295.31 ex VAT)	£2,348 (£1,998.29 ex VAT)	£2,691 (£2,290.21 ex VAT)
Processor	Intel Pentium 133	Intel Pentium P120	Intel Pentium 133	Intel Pentium 120
RAM supplied as standard	8Mb EDO	16Mb EDO	8Mb EDO	16Mb EDO
Maximum RAM	32Mb EDO	72Mb EDO	48Mb EDO	48Mb EDO
L2 cache	256Kb pipeline burst	256Kb pipeline burst	N/A	N/A
Hard disk size	1Gb	1.3Gb	1.1Gb	1.35Gb
Swappable components	CDD, FDD	CDD, FDD	Battery, CDD, FDD	CDD, FDD
CD-ROM speed	8X	6X	6X	10X
CardBus supported?	○	○	●	○
Zoomed Video supported?	○	●	○	●
Video memory size and type	1Mb VRAM	1Mb VRAM	1Mb VRAM	2Mb VRAM
Pointer type	Touchpad	Touch sensitive pad	Glidepad	Mousepoint
Sound enhancement technology	Wavetable	Wavetable	Synthesised	FM Synthesis
IrDA	● (v1.0)	● (v1.0)	● (v1.1)	● (v1.0)
Screen size & technology	11.4in STN	12.1in TFT	11.3in TFT	11.3in TFT
Maximum resolution	800 x 600	800 x 600	800 x 600	800 x 600
On-screen colours (800 x 600)	256	65K	65K	16.7 million
Battery type supplied/claimed life	NiMH/3 hrs	NiMH/2 hrs	Li-Ion/2 hrs	Li-Ion/up to 4 hrs
Dimensions (WxDxH) in mm	292 x 224 x 48	300 x 290 x 47	297 x 245 x 58	299 x 235 x 57
Weight with battery	2.8kg	2.95kg	3.4kg	3.4kg with CD-ROM
Software bundle	Win95, CompuServe	Win95, Win 3.11	Win95, Win 3.11	Win95 or Win 3.11
Basic warranty	3 yr BTB	3 yrs	3 yrs RTB	3yr International
Warranty options	To be announced	3 yrs RTB	n/a	Back to dealer
Technical support	National rate	0345 573098	Phone/email/fax support	Back to dealer

● Yes ○ No

p196 ▾

Evesham Micros Vale Quest

When Compaq introduced its Armada 4100 model last year, it was obvious that sooner or later the Taiwanese would start cloning it. So it was no surprise to see Evesham's latest notebook use the same idea of a slimline unit coupled with a media docking station, with a CD-ROM drive and extra speakers.

However, despite its slimline appearance, the weight advantage of the Compaq 4100 has not been replicated in the Quest. The basic notebook has a floppy drive and speakers, plus the usual connections and ports. Putting it on top of the media docking station does make it exceptionally large, though. The extra speakers do not make that much difference to the Quest's mediocre sound quality.

The notebook itself makes the most dreadful noise; it sounds like an old vacuum cleaner buzzing away down the corridor. This was obviously the product of an irritated fan, and extremely annoying.

The screen is an 11.3in TFT. Overall it was crisp and clear although the colours were a little faded. Brightness is controlled from the keyboard via the function keys, which is never very satisfactory. There is no bar or other measure on-screen so you cannot tell to what extent you have increased the brightness.



The keyboard is firm and feels entirely robust, my only gripe being the small size of the function keys, especially the delete key, which is the size of the nail on your little finger.

The performance was less than inspiring for a P133, which may be attributed to the lack of L2 cache. However, it should be noted that slimline notebooks usually perform less well than larger models because power is sacrificed to jamming everything into a smaller space.

PCW Details

Price £2,277 (£1,937.87 ex VAT).
Only available direct.
Contact Evesham Micros 01386 765500
Good Points Slimline.
Bad Points Slow performance. Noisy.
Conclusion Only for those who cannot afford the Compaq 4100.

★★

IBM ThinkPad 365XD

The 365 ThinkPads are at the bottom of IBM's range, below the 760s and the slimline 560s. Yet you'd never know that it's low-end. The 365XD we saw outperforms and out-swanks many other notebooks.

The screen was only a 10.4in TFT, although larger screens are available on other models. Nevertheless, it is still an excellent screen, capable of running in 65,000 colours at 800 x 600, and is vibrant and even. There is a brightness knob next to the screen so you don't have to faff about with function keys.

The 365XD is slim and elegant and, like the 760, it has a certain amount of modularity in its internal build. The keyboard can be lifted to reveal the battery and the CD-ROM drive, but only the battery can be removed. The separate floppy drive is attached via a dedicated port.

As with all IBMs, the 365 is loaded with a mass of utilities: TranXit, IBM AntiVirus, CompuServe, ccMail Mobile, NetFinity, PC Card Director, Emergency Recovery Utility (ERU), IBM Online, Diskette Factory, and ThinkPad bits and pieces including a power management utility, personalisation utility, online manual, features



Personal
Computer
World

Highly
Commended

settings utility and a tutorial. All this makes it easier to handle the notebook's functionality and performance and ensures a smooth passage to getting online. Strangely, as in the Toshiba Satellite Pro, power management is set via IBM's own Windows utility and not in the oddly limited BIOS settings.

The keyboard is firm but clatters a little, and the trackpoint is easy to manipulate. The feet on the bottom tilt the notebook forward at a rakish angle. The sound isn't good though, being tinny and muffled.

PCW Details

Price RRP
£2,412 (£2,052.76 ex VAT). Street £2,190
(£1,863.82 ex VAT)
Contact IBM 0990 727272
Good Points Lots of utilities. Good screen.
Bad Points No internal floppy.
Conclusion Another winning ThinkPad.

★★★★

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- Microsoft® Windows® 95

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Notebook screens

Notebook displays vary widely in quality; from stunning to dire. The reason lies in the make-up of the screens. The two main choices are thin film transistor (TFT) or passive matrix screens, also known as dual-scan supertwisted nematic (DSTN). Both are liquid crystal displays (LCDs), so called because they have a layer of liquid crystals sandwiched between layers of filters. TFT screens are much higher quality but are difficult to produce in high yields, and this is reflected in the price.

All LCDs are backlit, the light source usually coming from an array of cold fluorescent tubes at the back of the screen. In front of this is the first of two polarising filters. Infinitesimally small lines constructed in the filters themselves only let through light travelling in the right direction, so filtering the ambient light into polarised or coherent light. The lines in the first filter are arranged vertically, and in the second, horizontally. If the light were allowed to pass directly from one filter to the other, it would all be blocked and the screen would remain dark. However, the layer of liquid crystals sandwiched between them twists the light, allowing it to pass through the second filter to the front of the screen.

In notebooks, the liquid crystals are rod-shaped or nematic molecules which are aligned by grooves in plastic, so bending the light that passes through them. How much they bend can be controlled by the amount of current passed through to them. The twist in the crystals determines the bend in the light. In their resting state, crystals typically twist through 90 degrees, so with no current applied all the light can pass through the filters. When the current is on, the crystals twist and block the light, darkening the pixels.

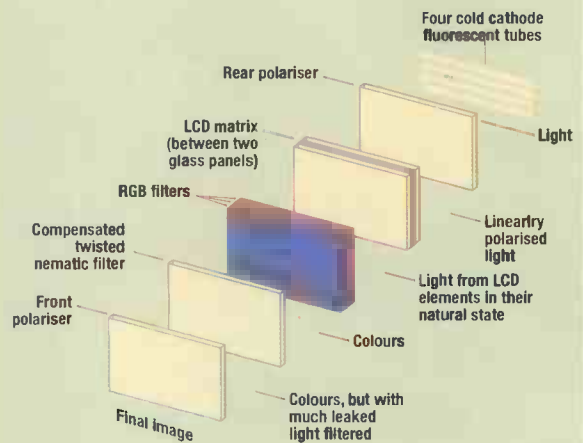
There are numerous ways of arranging the crystals. Supertwist Nematic (STN) screens have supertwist liquid crystals which bend light by 180° to 270°. Double Supertwist Nematic (DS or DSN) has two layers of supertwist liquid crystals back to back, so one bends light in the opposite direction to the other. Triple Supertwist Nematic (TSN) layers both sides of liquid crystal with thin polymer films. Films absorb less light than double supertwist, so less light and therefore less power is needed.

Above each crystal there are red, green and blue filters and, in TFT displays, elements which add the colours. In a TFT screen, each pixel is made up of three cells, or sub-pixels, in red, green and blue. The amount of light that passes through the filters and elements alters the hue of each colour, and so, as on your TV, millions of colours can be created using just three base colours.

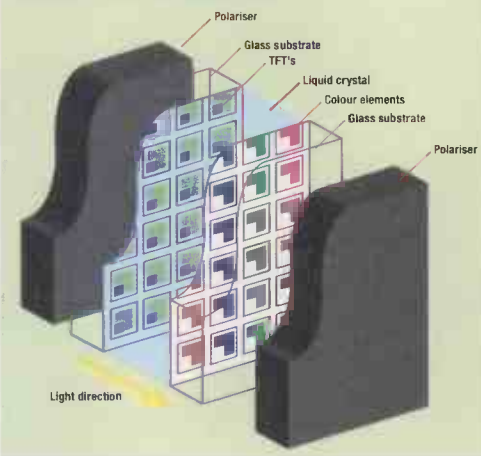
The main difference between passive matrix and TFT screens is how the current is applied to the crystal. In the former, the current is delivered via a grid system. The pixels are placed at the intersections of the horizontal and vertical lines. When the current rises above a certain point, the pixel is activated. The main disadvantage of this technology is that it is impossible to turn on one pixel without affecting those around it. This creates "crosstalk", which appears on the screen as bleeding and distortion. Contrast is reduced, the viewing angle is restricted, and colours are muted and less discernible. The grid system also slows the refresh rate of the screen, so flicker is common.

Some screens improve on the basic passive matrix design. DualScan splits a screen in half and gives each its own driver,

NEC passive colour display: How it works



Structure of NEC TFT colour LCD



Spot the difference: the carefully aligned TFTs and colour elements in the active matrix screen give a sharper picture than the passive matrix screen

enabling a faster refresh rate, improved contrast ratio, and reduced shadowing and bleeding.

TFT or active matrix screens have the same grid of conductors to control the current, but at each pixel there is a transistor which switches on or off depending on the current. Transistors are connected horizontally to form the scanning lines and vertically to form the signal lines. Horizontal lines are switched on in turn, from top to bottom of the display, while the voltage to vertical lines is varied. Each pixel is thus independent of its neighbour, leading to greater clarity and sharpness. TFTs run at much higher refresh rates than passive matrix screens and in some instances outperform CRT monitors. A separate transistor is needed for the red, green and blue cells in each pixel, so for a 1,024 x 768 screen you need a massive 2,359,296 transistors: if 12 of these fail when the screen is tested after manufacture, the screen is discarded. This is partly why the cost of TFT screens remains high. Typically, TFT screens run at a resolution of 800 x 600 in 65,000 colours, while DSTN screens are often only capable of 256 colours at the same resolution.

Although 12.1in TFT screens are commonplace, 13.3in screens are expected to be available in the near future. ■

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- †(256k L2 Pipeline Cache with P150+, and P133)

Cyrix P150+	£849	(997.58*)
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Intel Pentium P166	£1099	(1291.33*)
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 - Encarta 95,
 - Microsoft Works,
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Computers



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- 2 MB Matrox Mystique 3D Graphics
- Twelve Speed CD ROM Drive
- AWE 32 Sound Card
- 33.6k Fax/Modem - fast internet access
- 15" Digital SVGA Monitor (1Yr On Site + 2Yr's RTB)
- Intel Triton II Chipset VX430 Mother board
- Enhanced PCI I / O Controller with 16550 fast UART chip
- 3.5" 1.44 MB Floppy Disk Drive
- CE approved Mini Tower or Desktop Case
- Windows 95 keyboard, 2 Button Mouse
- 120W Active Speakers

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- Arthur's Living Book
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- Pilot 96
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- 5GB Maxtor Diamond Max Hard Disk Drive
- 512k L2 Pipe line burst cache
- 4 Mb Matrox Mystique 3D Graphics
- Twelve Speed CD ROM Drive
- AWE 64 Wavetable Soundcard
- 33.6k Fax Modem - fast internet access
- Aiwa 160 Watt PMPO Speakers with Subwoofer
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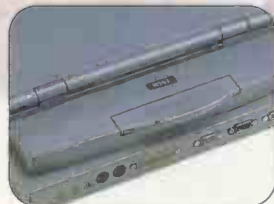


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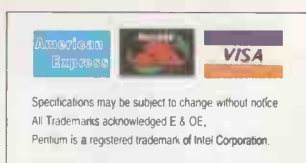
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P166

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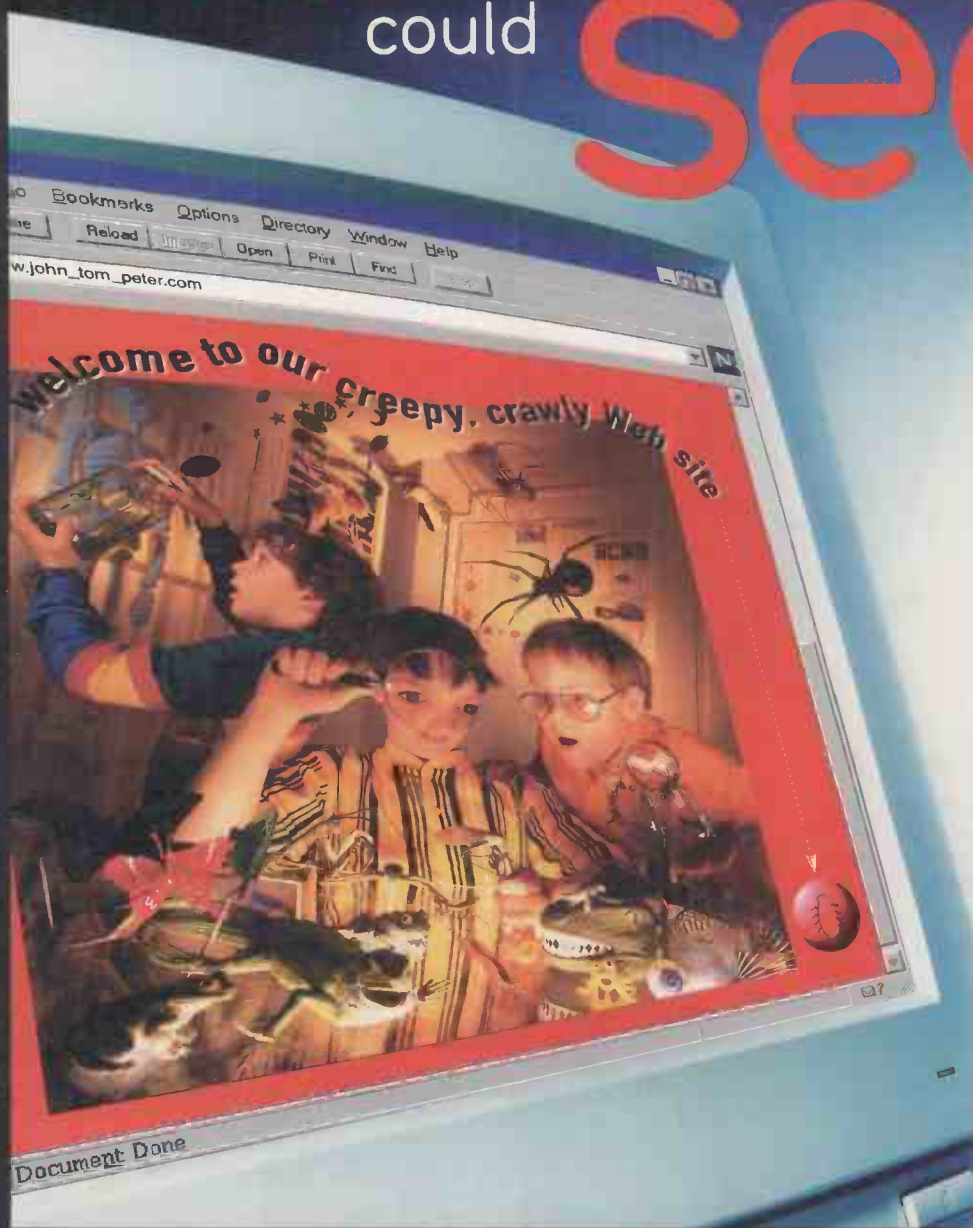
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PCW 04/97

Opti Calibre Plus

Opti was the only manufacturer to send us a DSTN (dual scan twisted nematic) screen; the others opted for TFT. Although TFT screens are becoming more common, many notebook manufacturers still offer DSTN screens as a cheaper option.

This particular 11.3in DSTN screen demonstrated the reasons why TFT is now the technology of choice: it suffered from bleeding and shadowing, caused by crosstalk (see page 198). It runs at a resolution of 800 x 600, but only in 256 colours, unlike its TFT equivalents which were capable of 65,000.

The build quality of the Calibre is reasonable, although it does look a little pedestrian.

The CD-ROM drive and the floppy drive swap in and out but there is no external bay to run both at once.

There is a catch at the bottom of the notebook which releases and pushes out the drives a small way, thus minimising wear and tear as you battle to get them in and out.

The RAM can be upgraded by unscrewing a plate at the back, revealing one free slot. But don't be tempted to go poking around in



there; a huge notice warns you that your warranty will be void if you remove the plate.

The keyboard is quite firm to the touch but is also noisy, and although the trackpad feels stiff at first, you soon get used to it. But like all too many trackpads, it is inaccurate and there is no Windows 95 key to make up for this. Some of the symbols on the function keys are a little obscure, which is unfortunate since many controls (including the brightness and volume) are operated from the keyboard.

The sound is tinny but there is no hiss, and you can get a decent volume out of the speakers.

PCW Details

Price £1,927 (£1,640 ex VAT). Only available direct.
 Contact Opti International 0181 507 1818
 Good Points Reasonable build quality.
 Bad Points DSTN screen. Poor performance.
 Conclusion The bargain basement option.

★★★

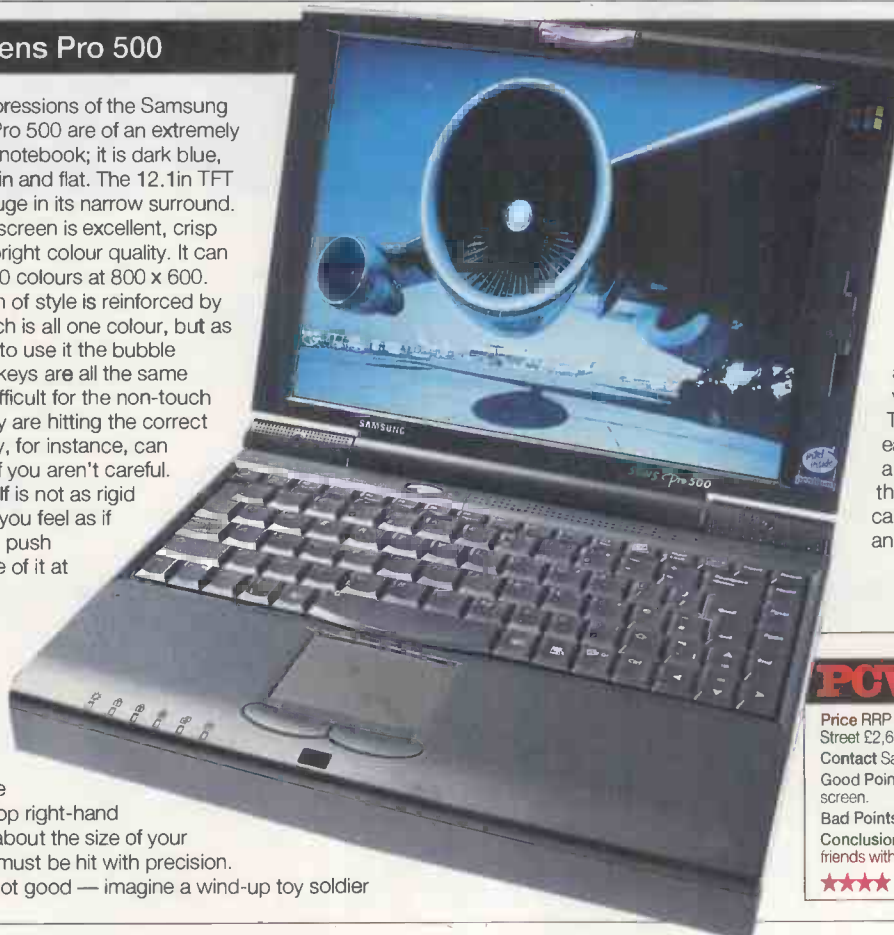
Samsung Sens Pro 500

First impressions of the Samsung Sens Pro 500 are of an extremely stylish notebook; it is dark blue, very thin and flat. The 12.1in TFT screen appears huge in its narrow surround. The quality of the screen is excellent, crisp and clean with a bright colour quality. It can be driven in 65,000 colours at 800 x 600.

The impression of style is reinforced by the keyboard which is all one colour, but as soon as you start to use it the bubble bursts. Since the keys are all the same shade it can be difficult for the non-touch typist to see if they are hitting the correct keys. The shift key, for instance, can easily be missed if you aren't careful. The keyboard itself is not as rigid as it could be, so you feel as if your fingers might push through the centre of it at any moment.

The function keys are well marked, with words rather than symbols to denote their use, even though they are very small. The delete key in the top right-hand corner is minute (about the size of your little fingernail) so must be hit with precision.

The sound is not good — imagine a wind-up toy soldier



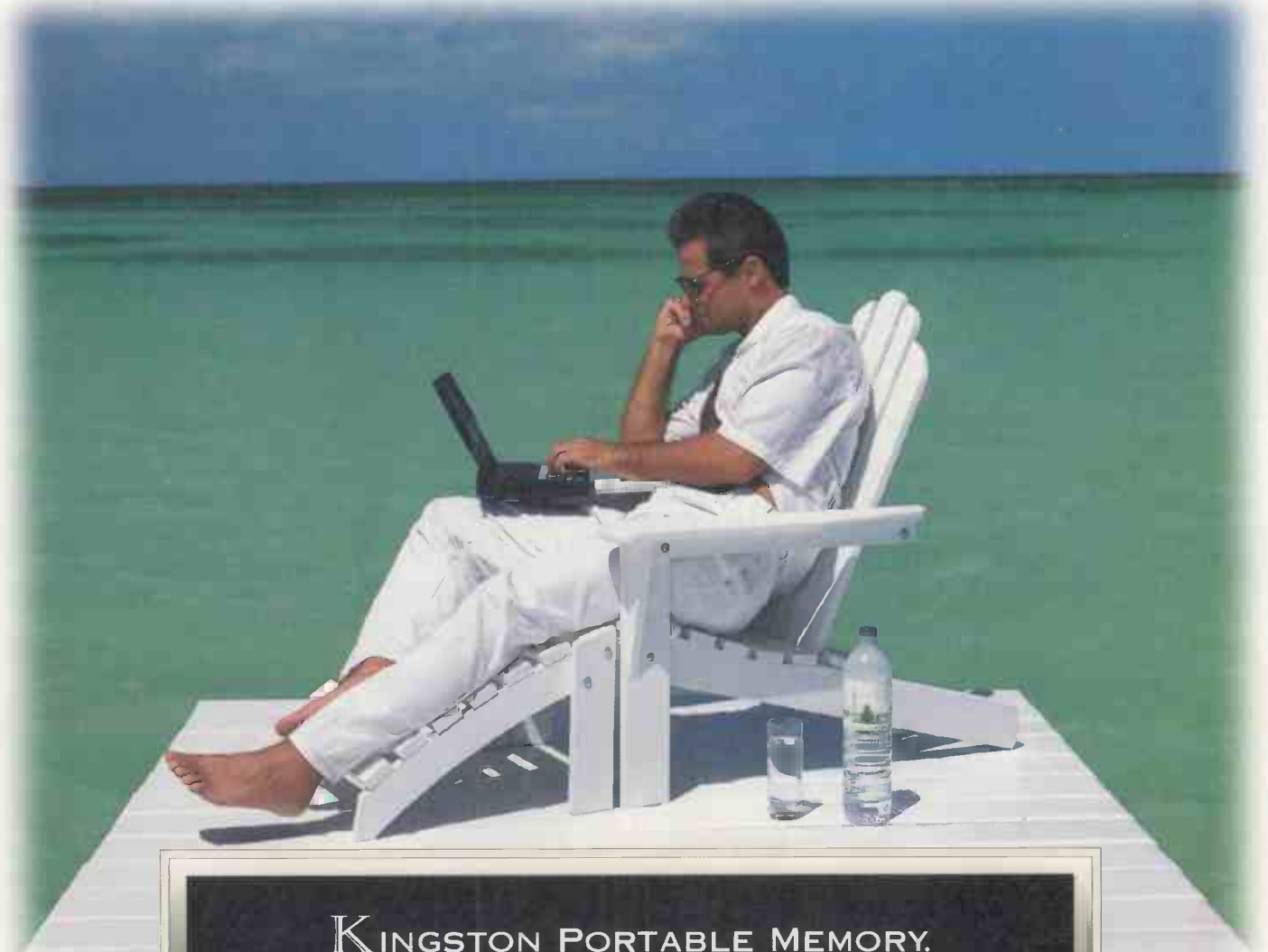
banging on a tin drum at the bottom of a well. It is tinny in the extreme, it echoes, and it's not even that loud.

Having read this, you could be forgiven for giving the Samsung a wide berth. But keyboard and sound apart, this is otherwise a very good notebook. The CD and floppy are easily swapped thanks to a nifty little flip-switch on the back, and the battery can be exchanged quickly and easily.

PCW Details

Price RRP £2,932 (£2,495.31 ex VAT).
 Street £2,697 (£2,295.31 ex VAT)
 Contact Samsung 0181 391 0168
 Good Points Excellent styling. Good screen.
 Bad Points Keyboard. Sound.
 Conclusion A notebook to impress your friends with.

★★★★



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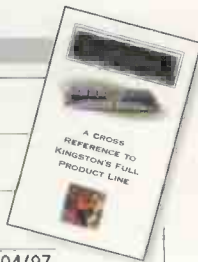
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VNU Labs Report: Usability

Notebook users fall into two main categories: those who want all the functionality of a desktop system in a notebook, and those who are looking for portability over functionality. With the second group in mind, our VNU Usability Labs recently tested four different notebooks to see how they performed on the move. Although these particular notebooks were not those reviewed in this group test, the results did highlight some of the general problems you might encounter when working on the move.

Usability, or HCI (human computer interaction), is an assessment of six key areas: efficiency, intuitiveness, error rates, ergonomics, how quickly you can learn, and how quickly you can remember how to perform certain tasks. All these factors are essential if you want to work effectively.

The evaluators were business professionals, travelling from London to Brighton by train. They all had to complete a series of tasks on each of the four notebooks using Microsoft Office and any pre-installed notebook utilities under Windows 95. They were asked to assess seven areas: ergonomics (screen, keyboard, pointing device, build quality), power management (was it easy to understand, set up and change?), help (on-line and manuals), installation, weight, ease of use and modularity (by installing peripherals such as CD-ROMs).

The quality of pointing devices and keyboards is a highly important issue in mobile computing. In a moving environment, the evaluators had more problems using touchpads than using



trackpoints on their notebooks.

Judders, whether they are caused by turbulence in an aircraft or bumping along an uneven railway track, will make your hand

jiggle on the surface of a touchpad and in extreme cases can render the device unworkable as the pointer movement becomes too erratic.

Many notebook users do not generally understand power management, and most leave the notebook's power management configured as supplied. They do not want to bother with switching power-saving modes and require maximum battery life with a minimum of fuss. As a result, systems with clear power facilities such as easily-identified function keys and intuitive software, fared better than those that relied on BIOS settings.

The optimum weight for a notebook is purely a matter of individual preference. In our study, some of the evaluators considered that even the heaviest of the notebooks were quite portable, while others found the lightest ones difficult to carry around. So really, the only way to find the ideal weight of notebook for you, personally, is to actually lift it.

Jonathan Ricks

Ten top tips for choosing a notebook

1. Decide what you want from the machine: do you need a desk-top replacement, or something light and portable?
2. What components do you need? If you are only going to use it for catching up with your email and typing the odd letter, a CD-ROM drive and speakers are luxuries. Swap-out components, like CD-ROM and floppy drives, can be a pain for regular use but save on weight if you only need to carry one or other with you.
3. The weight of your notebook is a major consideration. If you travel on public transport and carry a heavy 3.5lb machine, your arms will end up stretched to the floor. It could be worth paying a little more and sacrificing some speed for a lightweight model.
4. Battery life should match your needs. If you are away from a power point for long periods, you may need to carry more than one battery. Some notebooks can house multiple batteries, but as they are just about the heaviest part of a notebook, you must pay for the convenience. Nickel-Metal Hydride batteries are cheaper than Li-Ion batteries but they run down quickly and have to be completely spent before recharging, to avoid degradation.
5. Most notebooks now have TFT screens but passive screens cannot not be ruled out; okay, they bleed and aren't as crisp as TFT screens, but they're cheap.
6. Generally, notebook sound quality is not good. For presentations, it's worth investing in a pair of external speakers.
7. Many modem manufacturers offer deals on PC Card modems.

These don't always offer the best value so you might be best advised to shop around in the back pages of *PCW*. However, PC Card modems are difficult to configure, so choosing a modem you know to be compatible with your notebook might save you hours of frustration during installation.

8. So you have decided on a spec: before you start looking through the ads, decide how much you want to spend, then subtract a few hundred pounds. It may sound like a strange suggestion but advertised prices will probably be for minimum configurations; many notebooks will have only 8Mb of RAM. By the time you've allowed for an upgrade from a passive matrix to an active-matrix screen, put in a larger hard disk or a better battery and upped the RAM to 16Mb, you will have added significantly to the basic price, so the notebook that at first seemed a bargain is now worthy of a second mortgage.

9. Where should you buy? If you buy retail, you will get a limited choice and will pay the "high street premium". Buying direct cuts out the middle man and cuts the cost. Resellers can usually offer good deals on large quantities, and can provide their own extended warranties and technical support.

10. Warranties are not something to take lightly, as notebooks take quite a pounding. Many manufacturers offer a three-year warranty as standard. It's a good idea. Extended warranties are worth considering too, but it's wise to shop around. ■

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Sharp PC-9040

Sharp has a wide range of portable products, from the handhelds like the ZR-8000 and the ZR-5800, through the WideNote, to the 9040 and the top-of-the-range 9300. The 9040 does not have the same power as the 9300, although many other features are the same, and it does not have the compact size and impressive screen of the WideNote (reviewed in PCW, Feb). But despite all that, it is a contender in its own right.

Sharp is renowned for its screens. It is a major manufacturer of flat screens and has produced its own, patented, Super High Aperture technology. But this active matrix screen was not of the usual quality. It suffered slightly from bleeding and it seemed that there was some crosstalk going on (the fault may have been a one-off on this particular model). Nevertheless it was bright, with good colour.

Overall, the components are good quality. The keyboard is excellent, almost the best in this group; quiet and firm, but not spongy. The function keys are a good size and the layout is sensible.

The sound on this notebook is also among the best in this test. It was a little thin but did not overly suffer from tinniness and hiss as did most of the others,



and it handled bass and reverb well.

The floppy and CD-ROM drives are both included in the main body of the notebook, although the CD-ROM drive can be swapped out and a second battery fitted in its place.

There were two other nice touches. First was the power cord which can be plugged straight into the mains without the need for an adaptor. And second, as Sharp is part of the IrDA standards committee, IrDA 1.1 is supported at speeds of 4Mbits/sec.

PCW Details

Price RRP £2,701 (£2,298.72 ex VAT).
Street £2,348 (£1,998.29 ex VAT)

Contact Sharp 0800 262958

Good Points Excellent sound. Second battery capacity.

Bad Points Screen below par for a TFT.
Conclusion Good notebook, marred by a bad screen.

★★★

Toshiba Satellite Pro 430 CDT

The Toshiba range is divided into categories according to how much new technology will be included on the notebook. The Tecra range is top of the pile, followed by the Protégé series. Just below this come the Satellite Pros.

This notebook is a solid beast, with functionality leading over portability. But this is not too much of an issue because you get extremely high quality for your money. The screen is an 11.3in, 800 x 600 TFT running at a refresh rate of 60Hz in a maximum of 16 million colours. As you might expect, it is clean, crisp and bright.

The CD and the floppy can be swapped from the notebook into a separate hard case, connected to the notebook via a dedicated port. In practice, this means you probably change the drives less often, reducing wear and tear as well as the annoyance factor.

One of the best things about Toshiba notebooks are the utilities provided.

MaxTime Manager enables you to play around with the power and performance settings, providing a good deal of scope to achieve your exact requirements. You cannot get into the BIOS to change settings, but as many users feel more comfortable making



Personal
Computer
World

Highly
Commended

changes via Windows, and the utilities are so good, this is no great loss.

The Satellite Pro does not have an internal modem but the pre-installed CardWorks utility should make it easy for you to install a PC Card modem. There are two Type II slots or one Type III slot.

The sound is reproduced through one small speaker at the front of the notebook, which carries a volume knob. Turning the volume right up in the software as well as on the speaker produces a reasonable sound, albeit a little metallic.

PCW Details

Price RRP £3,167 (£2,695.31 ex VAT).
Street £2,691 (£2,290.21 ex VAT)

Contact Toshiba Information Systems
01932 828828

Good Points Outstanding build quality.

Bad Points A little chunky.

Conclusion An excellent notebook.

★★★★

Mobile computing

It has taken a while to get the functionality of a desktop machine into a notebook. Although notebook components must be squashed into a smaller space, the real issue is one of power. Modern batteries are not all they are cracked up to be, and if your battery only lasts a short time you must squeeze as much life from it as possible. If the desktop chips run at 3.3v, it's going to eat up a lot of the available power. Not only does a chip need to consume less power, but it also needs to be able to control the power in other parts of the system.

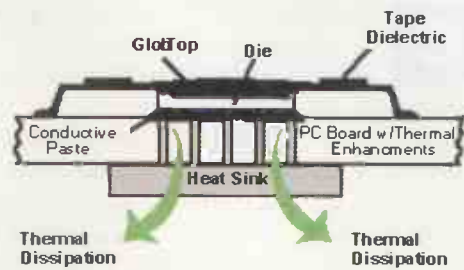
Another problem is heat. Pentium processors run very hot, so in a desktop machine they will have a fan or a heat sink above them. In a notebook you don't want a fan consuming power, yet heat sinks use up too much space. Other components in the notebook are cooled by devices like heat pipes and thermal sensors, and by using the system chassis to vent heat externally. Intel's answer was to develop mobile Pentiums and house them in a Tape Carrier Package (TCP). Voltage Reduction Technology dissipates the heat by allowing the external pins of the processor to be powered at 3.3v while the chip itself runs at 2.9v, with the core running as low as 2.45v. In this way, the chip can still communicate with components operating at 3.3v. This combination provides power savings of up to 40 percent over standard processors. The chips are 65 percent smaller and weigh 95 percent less than desktop processors.

The TCP is a thin piece of film with copper foil laminated onto one side. The copper is photo-imaged and etched to make

traces and leads which form the connection from the processor's silicon to the circuit board. The traces are gold-plated to bond to the silicon and prevent corrosion. The silicon is then coated with resin.

The latest notebook processors are MMX-enhanced with the larger instruction set, 32Kb of Level 1 cache and eight 64-bit registers. But Intel has ensured that they remain a small step behind the desktop models as the chips will only run at 150MHz and 166MHz as opposed to 166MHz and 200MHz in the desktop models. Yet the advantages of MMX in notebooks are more exciting than in the desktop. The extra power allows more processing to be handled by the processor, avoiding the need for extra hardware. Software modems are one example: once the signal has been received and converted to digital data, the MMX chip can process it. Modems can then be added to the system board without fear of them lagging behind current communication speeds, as only the firmware would have to be upgraded.

• Unfortunately we were unable to edit out the typographical errors in the diagram above. ■



Connectivity

The days of standalone working have gone, so having a notebook that cannot communicate with another PC is about as useful as ice-skates in the Caribbean. But help is at hand, and there are now countless ways to wire up your notebook to the office network or the internet. The four main ways are by PC Cards, IrDA, built-in modems and mobile phone.

PC Cards are commonplace and there is now a wide range of modems (some with ethernet adaptors) costing from as little as £120, or £250 with a LAN adaptor. ISDN adaptors in PC Card form are beginning to appear: expect to see more in the coming months. Another development in PC Card technology is CardBus, a 32-bit extension to the 16-bit PC Card peripheral interface. It enables data throughput rates of up to 132Mbits/sec, but as yet there are few cards on the market which support this standard.

PC Cards have some disadvantages. Firstly, they are difficult to configure and can have you pulling your hair out in frustration. All the workings of a PC Card have to be in software, so if you have a conflict there are no jumpers you can change to force it into submission. You may be unlucky and find that your PC Card will not work with your notebook no matter what tricks you try.

You should make sure your modem is certified for use by whatever country you are in. Almost every country in the world has a different telephone system and modems that are not configured

to work correctly with a particular phone system are likely, at best, to play up, worst, to damage the phone line.

An increasing number of notebooks are coming with the modem already built in, so all you have to do is connect the wire and plug it into the telephone socket.

All the notebooks in this group test came fitted with IrDA (Infra-red Data Association), mostly complying to the older IrDA 1 specification. But there are a few notebooks on the market which follow the IrDA 1.1 specification, notably from Hewlett-Packard, NEC and Sharp which are active participants in the IrDA standards committee. IrDA 1.1 is also known as FastIR and has a data throughput rate of either 1.5Mbits/sec or 4Mbits/sec, while standard IrDA can only manage 115bps.

For mobile communications it is possible to connect a mobile phone to a notebook via a suitable PC Card and use it as a modem on the move. Whether you're sitting in a train, a car or at a remote location, you can email, fax or browse the web, wherever your phone has a signal. You'll need a suitable digital mobile phone connected to Orange, one2one, Cellnet GSM or Vodafone GSM. Mobile data is reliable but operates at 9,600bps (maximum) and can drop lower under demanding conditions.

Remember that all PC Cards will drain your notebook's battery, so remove them or activate sleep modes when not in use. ■

Personal
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**Editors
Choice**

Editor's Choice

Choosing a notebook that is right for you is a complicated business: not only must you hit the right price and the right components, but the machine must also suit your intended purpose.

There is no such thing as "the perfect notebook" so the choices we have made are based on three criteria: speed, build quality and ease of use. Let's face it, if you are going to spend £2,500 on anything, you want to make sure it is going to perform well and will last the course.

Most owners have notebooks so that they can make presentations and use a word processor, a spreadsheet and email. For presentations you need to make an impact, and if your battered old notebook is not equal to the task, it can take the edge off your image. Notebooks can take a good bashing as they are humped around, so it makes sense to buy a sturdy, well-built product that will last the distance.

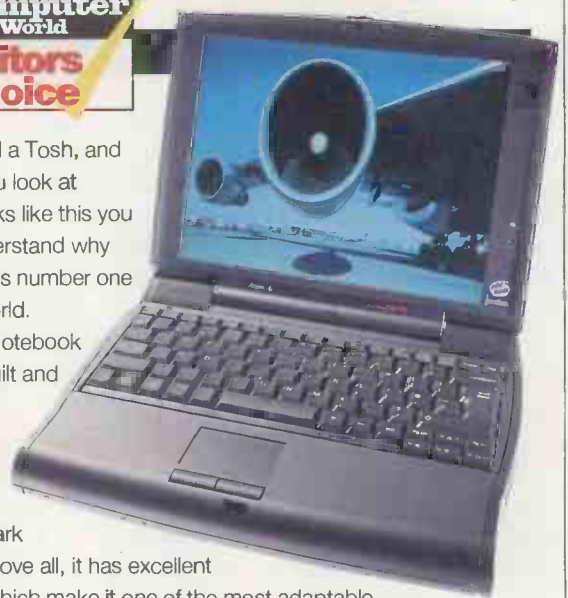
The clear winner of our Editor's Choice, in terms of speed, has to be the AcerNote 970CX. This was the only machine to have a P150 processor, which obviously made an impact in the tests, but it was also one of the few to include 256Kb of secondary-level cache. Also, the NeoMagic 128-bit graphics chip takes the strain off the processor, and this again shows in the Windows applications results. Add to this nice styling and extremely long battery life, and you've got a winner.

The Toshiba Satellite Pro 430CDT is Highly Commended. It

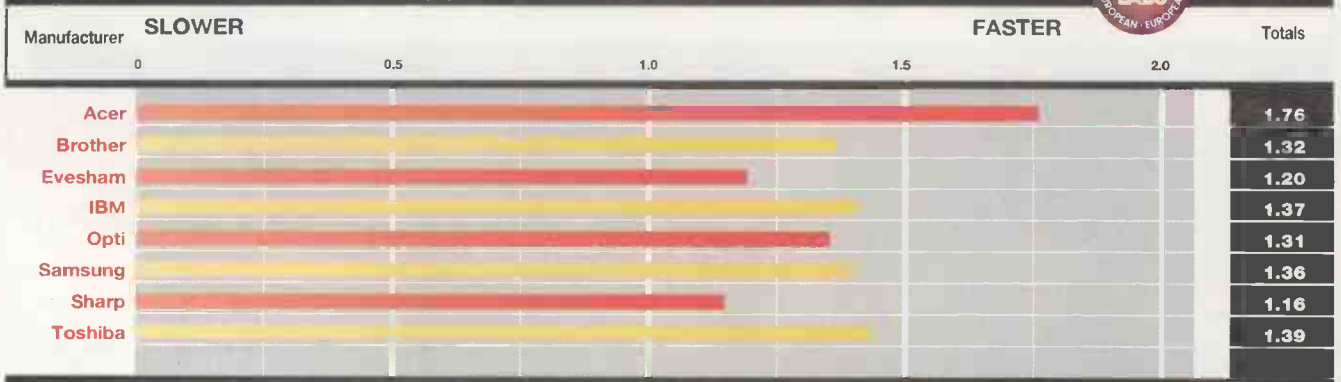
is after all a Tosh, and when you look at notebooks like this you fully understand why Toshiba is number one in the world.

This notebook is well built and achieved good scores on our benchmark tests. Above all, it has excellent utilities which make it one of the most adaptable and easy-to-use notebooks on the market.

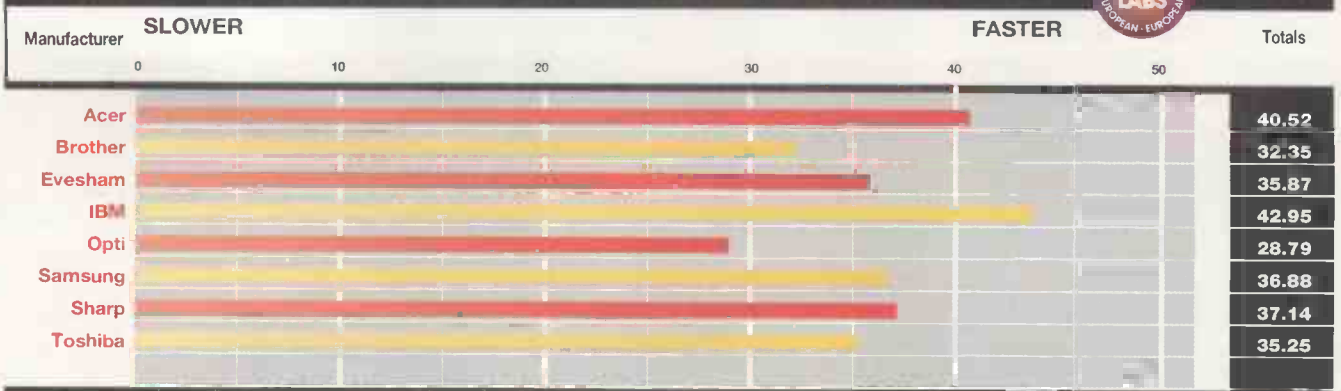
The IBM 365XD also receives our nomination as a Highly Commended product. Like the Satellite Pro, the 365 is not a top-of-the-range product, but because it comes from the ThinkPad stable some of the innovation and design excellence applied to the higher-level models has filtered down into this one. The screen and its build quality are equal to that of more expensive notebooks and you get the usual armoury of utilities that come with an IBM as a matter of course.



Windows Applications Results



Doom II Results

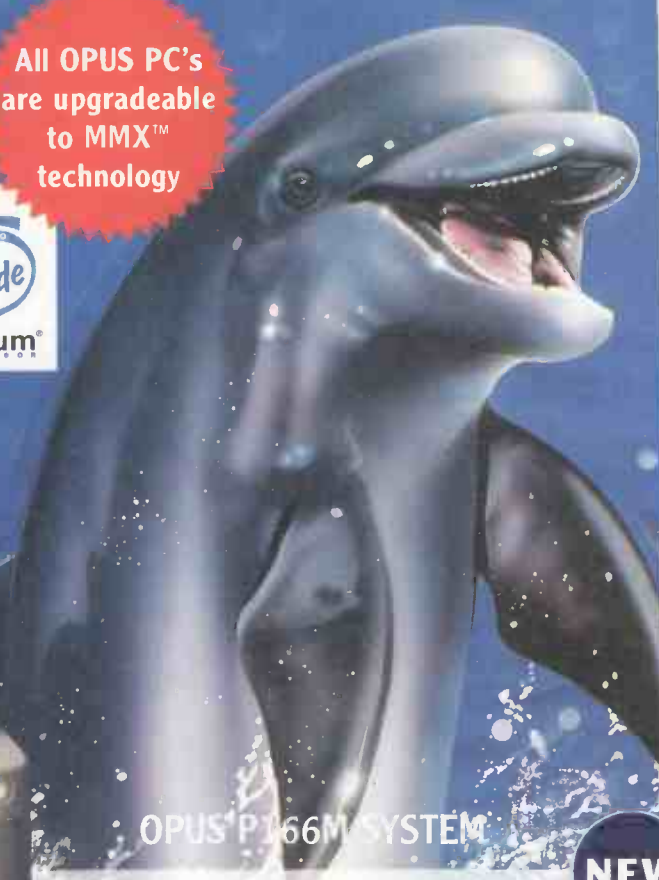
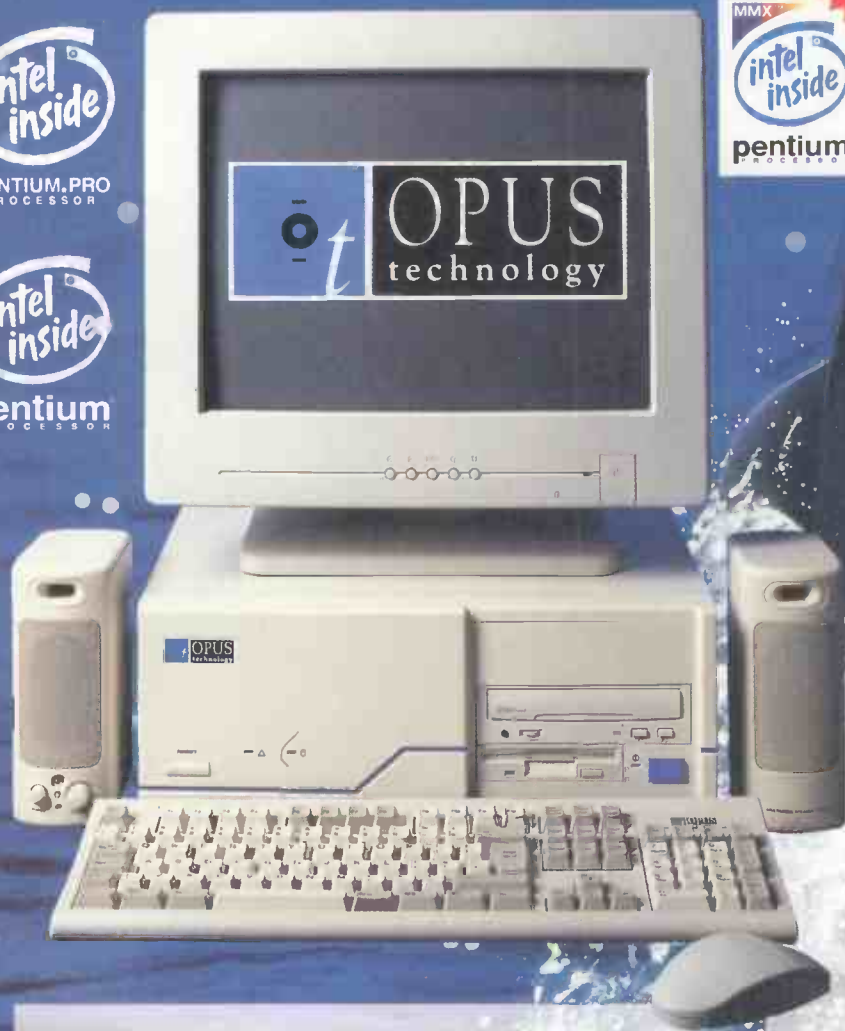


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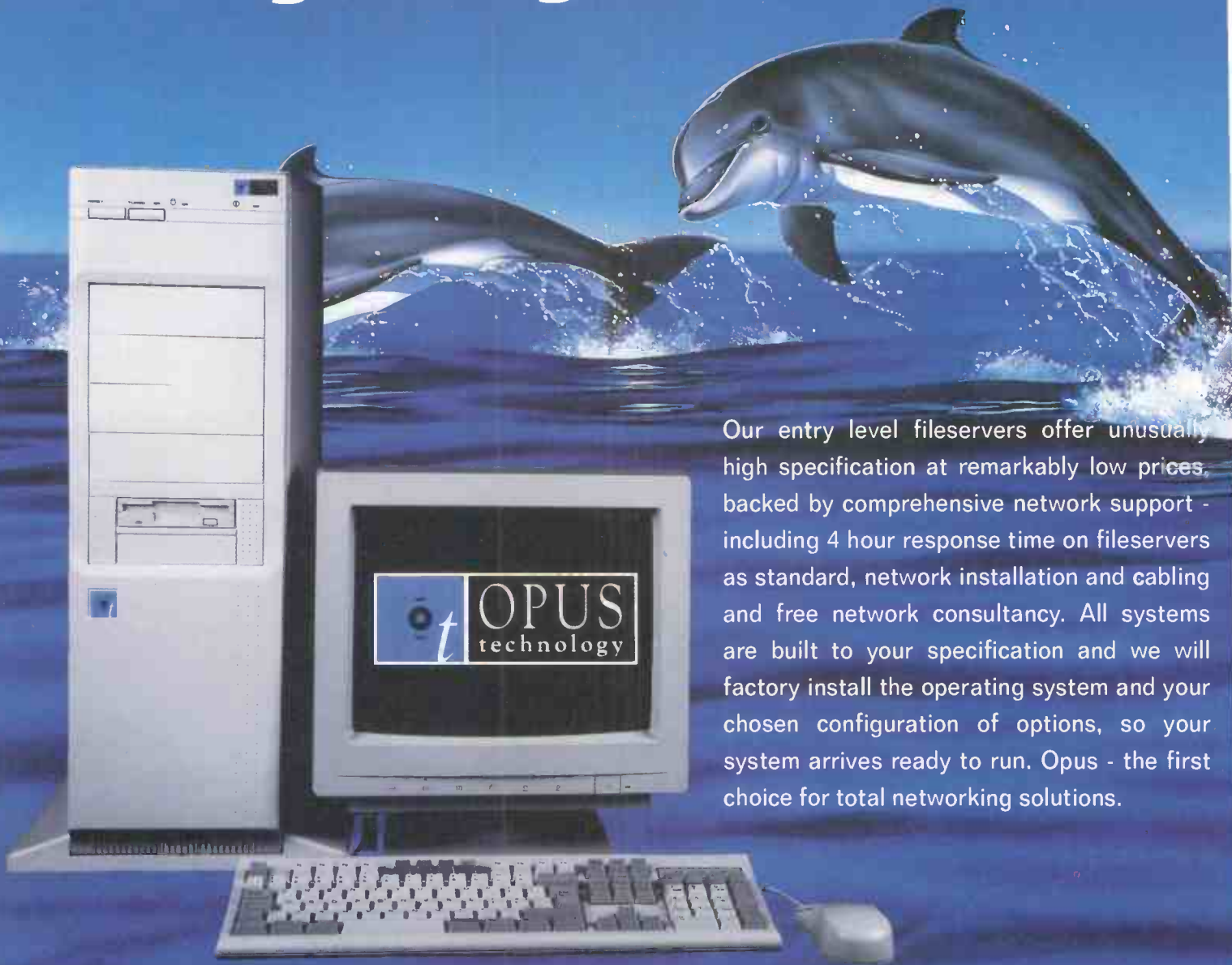
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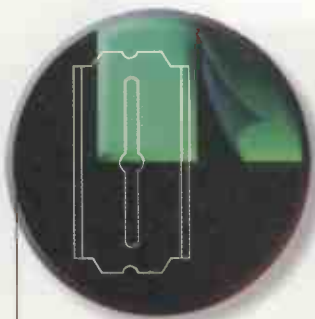


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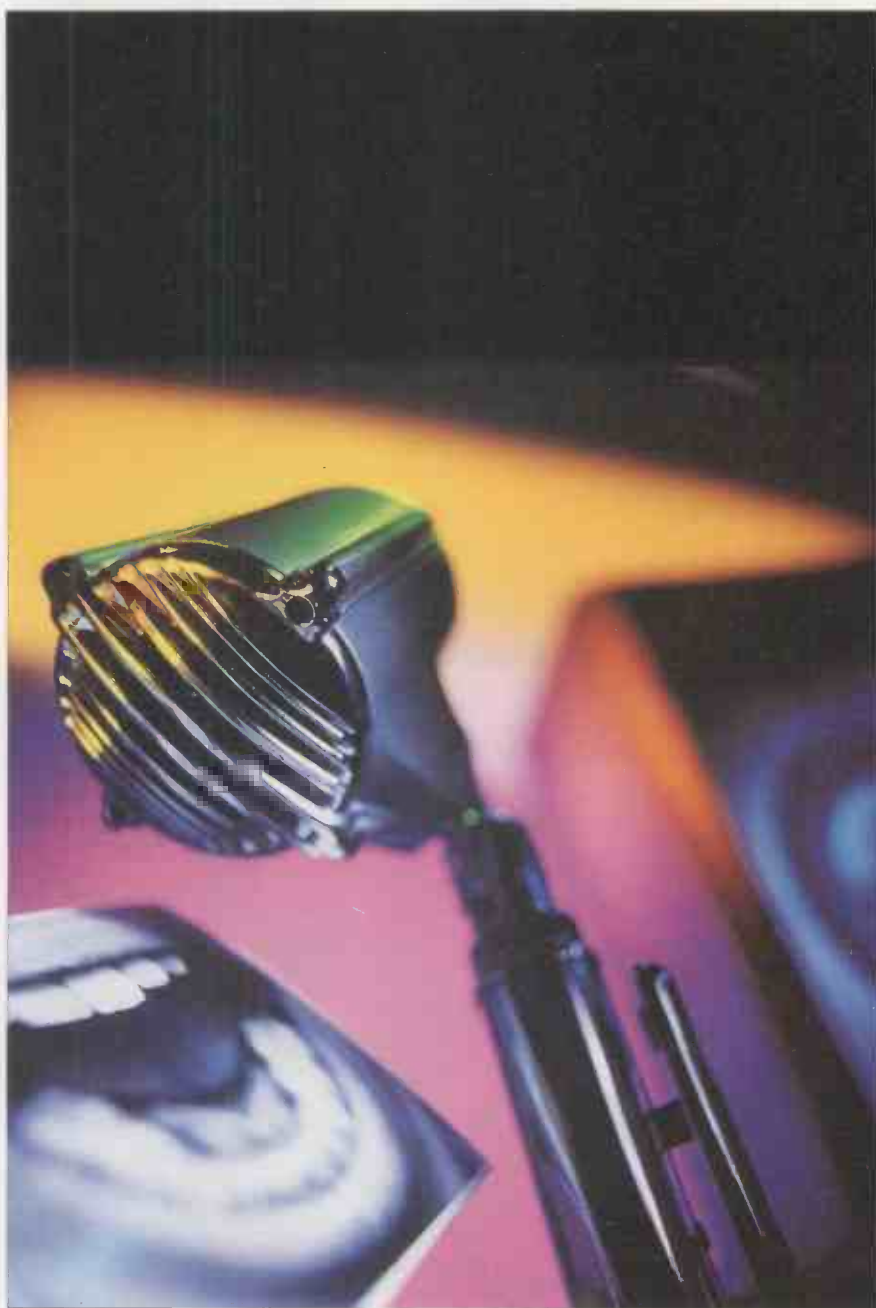
As the web is a place to canvass in the run-up to the general election, so extreme political groups are taking advantage of the web to propagate their policies. Tim Phillips reports.

Taking over an embassy and holding 74 people hostage isn't the sort of politics we're accustomed to in the UK, so when the Tupac Amaru Revolutionary Movement (MRTA) did just that at the Japanese Embassy in Peru on 17th December 1996, the event predictably made headlines.

But if the kidnapers thought their actions were a way to put across their political message to the world's media, they were mistaken. Not surprisingly, the news coverage centred on the human story of the hostages in the embassy. More time was given to the presence of Mariachi bands at the embassy gate (hired by relatives of the hostages to boost morale) than to the details of the guerrilla's demands.

But the MRTA had a secret weapon, enabling it to take its political message to the public and bypass the traditional media. The day after the siege began at the embassy, it posted its Solidarity Page, *Voz Rebelde* (Rebel Voice), on the web. The page has since been used to issue demands, conduct interviews and even relay pictures from the inside of the compound: dramatic do-it-yourself images of the kidnapers, broadcast to the world. The guerrillas are the highest-profile example of a recent trend among rebel political groups to use the *laissez-faire* ethics of the web to communicate their views.

Before the MRTA, Zapatista rebels in Mexico and the MRTA's enemy, the Shining Path, had used the web for similar ends. In September 1996, the Revolutionary Armed Forces of Columbia backed its offensive against a military base with net reports, until the government pulled the plug. The MRTA's communiqués, which anyone is free



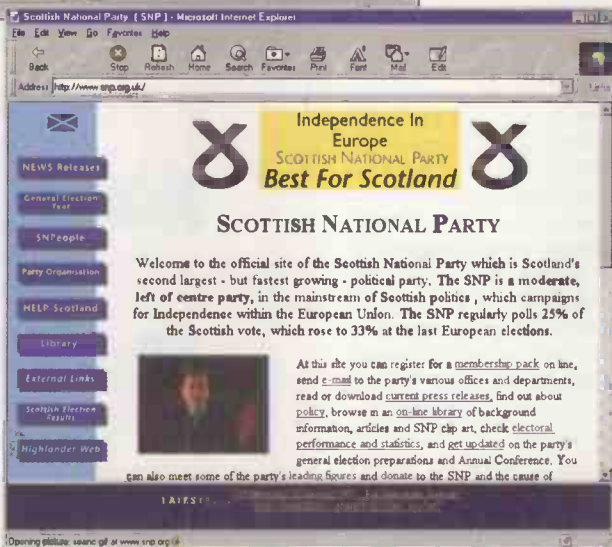


Left The MRTA home page — guerrillas with a message for the world. Well, quite a few messages, actually

Below More Nationalism, but of a more savoury kind. The Scottish Nationalists have a well-ordered site with multimedia and an endorsement by Sean Connery

to read on the web site, make fascinating reading. "The repression against the men and women of the free press has left only pro-government journalism that puts a gag on itself as a means of survival," says international representative, Isaac Velasco, asking sympathisers to email the government of Peru. Because the page is hosted outside Peru, the government is powerless to stop it.

It's not just revolutionary guerrillas that have taken to the web to explain their politics. Everyone from the Natural Law Party to the Klu Klux Klan has a site dedicated to their political views. Of course, if politicking on the web really worked, then no-one would have to take hostages to get the world's attention. With less than a million people with internet access in the UK, the web has a limited effect on public opinion. But it is influential enough — especially with those political prize voters, the kids — that few political parties ignore it. Also, the web has proved a method for political organisations to issue rapid rebuttals, denials or policy statements. New Labour has an area specifically dedicated to rebutting unfavourable coverage. The Scottish Nationalists issue snapshot opinions on everything from a political assembly to the new Royal Yacht.



Politicians no longer have to wait for parliament to open or the press to call on them before they give an opinion. At some time before 22nd May, we're going to have a general election — the first election of the internet age. Not surprisingly, all the major parties want to capitalise on the immediacy of the web to score a propaganda victory. All three mainstream political parties now have largescale web sites which are gearing up for the election (see page 218).

Among the smaller parliamentary parties, perhaps the best site — as professional as anything you'll find from the "big three" — is the Scottish Nationalist Party's home page. Scroll down from the shot of leader Alex Salmond MP, and there's a familiar face — it's Sean Connery, right eyebrow quizzically raised. "What we seek for Scotland," Connery says, "is the normal status of a small ancient nation." This small ancient party has the nous to use the web

p218 >

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ambitiously, with information for outlying Scottish regions and even QuickTime movies. Down and to the left, Plaid Cymru uses its web page to provide bilingual information: the home page is in Welsh, but you can link to a mirror site in English.

It's on the fringes of political activity, right, left and left-this-planet, that some of the most impassioned and surprising political information and invective can be found. If you have an opinion, someone out there shares it. And at least six others violently disagree with it. The largest growth area for politics on the web has been on the extreme right, especially among nationalist movements. Whether or not you consider this politics or just old-fashioned racism,

many people are using the web to propagate beliefs that have been excluded from the mainstream media. From the odious race-hate of the Voice of White America ("The White Man must retake his country. There is no time for fear. We all must stick together and rise") through the more guarded assertions of "nationalist" organisations like Crosstar, the far right luxuriates in the freedoms granted by the lack of political censorship on the web.

Richard Barrett, General Counsel for the American-based "Nationalist Movement" (www.nationalist.org) thinks that the traditional media is becoming more hostile to his views, and the web allows him to expound those views in a way that

otherwise he couldn't. Surprisingly, for an organisation that in the UK could be accused of incitement to racial hatred, he isn't anti-censorship; rather, he believes that people who disagree with him should be silenced on the web. "The web has a contribution to make to politics, provided that the discussion is not subversive or obscene," he says, "We back laws which will ban subversive and pornographic materials on the internet entirely. We support the Fist Against Filth Campaign, as well as the Communications Decency Act." He supports censorship of "subversive, communist, threatening, harassing, perverted" material, which in view of some of the comments of visitors to the site,

Seconds out, it's the general election

A cynic (this is politics, after all) might observe that the most remarkable feature of the three web sites hosted by the three leading political parties is how similar they are to each other. This doesn't just apply to content, because after all, that's understandable: they're all dealing with the same subject. What's more surprising — or significant — is that they all use the same basic design and format: even the colour schemes are similar.

The Conservative Party site opens with a welcome from John Major, who wins the Technology Chutzpah Award, claiming the internet for the Tories. "Every breakthrough in communications technology this century has started under Conservative governments," he writes. "It's not surprising the UK has more people connected to the internet than any other country in Europe."

You can't argue with logic like that. The site has a collection of information about policy, people and the party organisation, but adds an online magazine called The

Messenger (at the time of writing this was several months out of date) and, hidden away in a frame at the bottom of the page, a multimedia area. If you want to watch a video of the Prime Minister answering questions at conference, or watch Phillip Oppenheim MP in action, you're in the right place.

Labour's web site could be branded the "Not The Conservative" web page. Larger than the "New Labour" logo on a restrained front page are warnings about what the Conservatives could do to us.

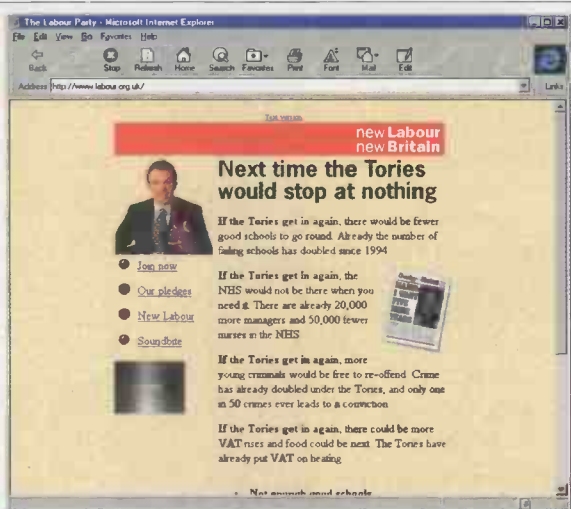
A little deeper into the site, and you think you've accidentally switched back to the Tory pages: there's the Union Flag fluttering against the same beige background of the Conservative site. New Labour has less to offer if you're looking for multimedia, but it has more depth, more policy information, and more contacts to reach by email. There's a shop too, and an area dedicated to giving Labour's "spin" on current news stories.

Labour knows the risks of running a web site: in December 1996, hackers called the Digital Anarchists broke into the site and changed Tony Blair's image to that of his Splitting Image puppet. Labour's response to the budget was replaced by a live sex show, and the headline to "New Labour — same politicians,

same lies". It may not have been the most subtle hack, but the Digital Anarchists are threatening to hit other main political parties, which should live up some of the more tedious pages on all three sites.

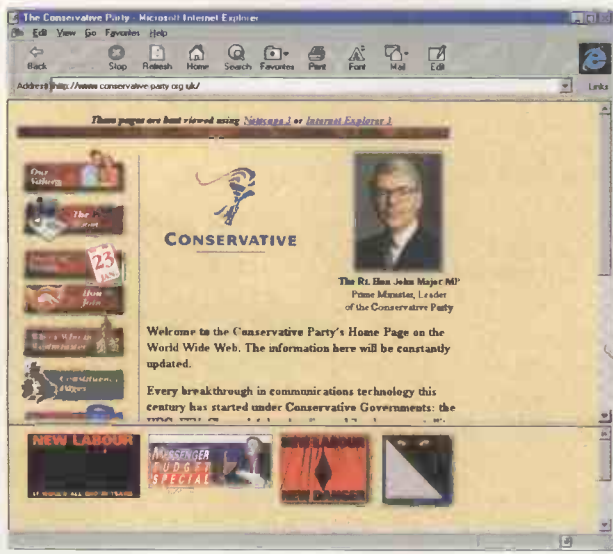
The least slick of the three, the Liberal Democrats (again with a yellow background, although it is their party colour) have a site that's probably the easiest to navigate. "We are on the web because it represents the future of communication and information," says a rugged-looking Paddy Ashdown. According to his spokesman for science and technology, Nigel Jones MP, Ashdown knows his stuff. "It helps having a leader who is computer literate and a visionary," he said. "Liberal Democrat thinking is much more advanced than that of either of the other parties."

If this is true, there's little evidence of it, apart from the fact that Liberal Democrats are by far the easiest to reach via email. The major political parties are using their web sites to disseminate information rather than pursue more ambitious social or political projects using the net. But as the Digital Anarchists taught Labour, the net can be a more demanding audience, with its own way of voting.



.....looking suspiciously like New Labour

The Conservatives at home.....

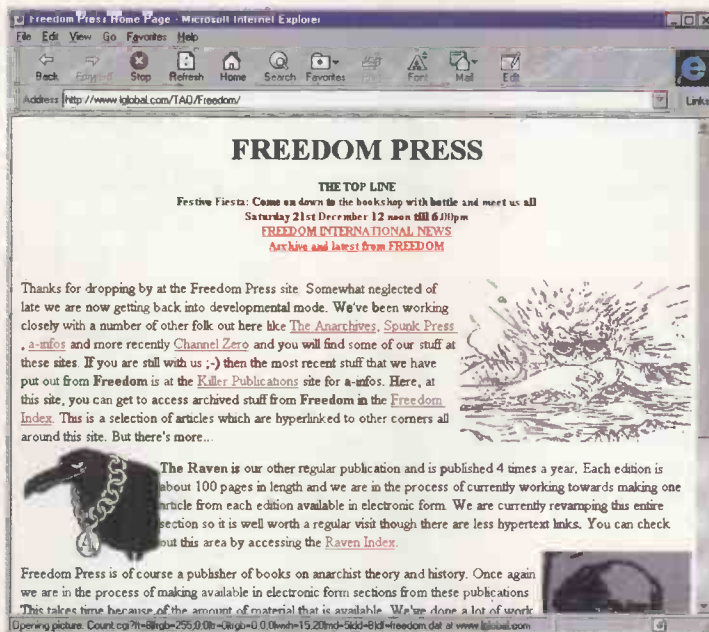


might safely be described as ironic.

The far right is represented by only one UK-based home page which claims no party allegiance, instead calling itself the "British Nationalists Home Page". It is certainly diligent at combing the print media and the net for supportive comments, and the page editors (who prefer anonymity) aren't apologising. "We would not accept that we are outside the mainstream," they told PCW. "The media is largely a monolith which blocks all views outside a narrow approved range." The argument is, then, that other opinions are not heard because they are illegitimate or have no support. Noam Chomsky calls it "manufacturing consent", with self-censorship by journalists rather than overt control. "What we say generally is thought by millions, even if they are silenced by fear at the moment."

While they grant that their views on the holocaust (they don't believe it happened) would fall outside this silent majority, this is, they believe, only because people know too little to judge, which, of course, they are trying to use the web to correct. Despite their opinions, which most internet users would find unpalatable at best, the British Nationalists epitomise a belief of many net users that runs counter to prevailing political thought: that no matter what you think, on the internet you have a right to think it, and to tell people about it.

This has tricky ramifications for the censorship debate, currently centred around pornography (see page 220). The British



The revolution starts today, says the Freedom Press. More details here

Nationalists are happy (even if they don't sound overjoyed) with this state of affairs. "The coming big issue for society is totalitarian censorship and control, overt or indirect." They add: "The web will play an increasing role as the equivalent of the 'Underground Press' during the sixties, if the media refuses to admit a wider spectrum of viewpoints. We are happy to see the left or anyone else put across their arguments on the web. It is they who want to censor everyone else. They are out of tune with the times, and particularly the web, which people join specifically to speak freely."

Leading the battle against the far right,

we find the anarchists. The internet is often touted as a state of anarchy, as people willingly provide resources without an overall "governing body", but compared to the mushrooming of far-right activity on the web, there aren't many anarchist resources. Freedom Press, hosted by a political organisation called the Media Collective, is probably the largest anarchist resource. "An alternative world of creativity and freedom," promises the blurb. "Education accompanies the transformation as the living language flows among free people." Despite the happy talk (a welcome breath of fresh air after the fetid atmosphere of the p220 >

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British Nationalists), Freedom Press's representative doesn't think the web will change the world. "We are simply publishing things on the web that have already been published in other media, but I feel we are reaching more people we might not otherwise reach, like you for example. We

are perhaps more active in email, which we prefer." Freedom Press doesn't run a flashy page full of soundbites. "To be reported on by the media is simply to be part of the spectacle. We are not interested in passive participation — we hope people will seek to act as a result of what they read and learn."

Why not use the internet to make converts, like the right? Won't the web have a long-term effect on politics? The answer is: "Who cares? The revolution is today".

In case you wake up tomorrow and the revolution hasn't happened, you might fancy an excursion into the world of lost-

The thought police: do we need them?

The internet isn't governed by the laws of any one country: its unique advantage is that it crosses all boundaries of geography, culture, age, race and sex, allowing anyone to express their opinions. Political freedom of expression is long regarded as a good thing. But should that freedom on the internet give a platform to racists, terrorists and revolutionaries, right and left wing? Currently, it does.

This cherished freedom relies on the "common carrier" status of Internet service providers. That means an ISP is treated in law like a phone company, which cannot be prosecuted for the content of conversations you have on the phone because it has no control over what you choose to say. A UK-based ISP would not be liable for the contents of a neo-Nazi site, for example, but if the same statements were published in PCW, the magazine could be accused in British law of the crime of "Inciting Racial Hatred".

Kicking political extremists off the web is impractical too. Who administers it? Which country's laws would be used? And most importantly, where do you stop? The MRTA have broken Peruvian law by taking hostages: should they be given a platform to explain themselves? Do you censor their guerrilla opponents, the Shining Path, too?

Many bodies, such as the Internet Frontier Foundation (www.iff.org) take an anti-censorship position. The UK's ISPs, generally speaking, are trying to be more pragmatic. Both the Internet Service Providers' Association (ISPA) and London Internet Exchange (LINX) support the efforts of the police to encourage limited censorship. So far, this has concentrated on child pornography,

but as LINX chairman, Keith Mitchell, admits, politics will be next.

"LINX policy is that its members should remain within the law, and that the laws for cyberspace should be as consistent as possible with laws for all other aspects of everyday life," he says. "It was decided to tackle child pornography first because the media and presumably the general public regarded this as the most serious problem, and also because the legal definition of child pornography was most clear cut. It is the intention to extend reporting activities to other types of criminally illegal content, which could certainly include incitement to racial hatred."

The mechanism used in the UK is the Internet Watch Foundation (IWF), set up by former Pipex MD, Peter Dawe, in December 1996. Internet users report offensive material to the IWF, who then ask participating ISPs not to store the material on their servers and may pass the complaint to the police if the perpetrators are UK based. It doesn't take the material off the net, it just makes accessing it harder. Already, IWF has passed on five reports of illegal postings on Usenet to the police.

"If material published on a web site or in a news group breaks, for example, the Race Relations Act," Mitchell explains, "a member of the public could complain to IWF, who, if they felt there was a case, would notify LINX members and the authorities that there was potentially illegal material being published. LINX members would then be in a position to decide whether they wanted to take action to remove this material to protect their customers."

While Mitchell claims that this will boost the ISP's claim to be a "common carrier", others see this process as fatally undermining it and freedom of speech. Currently the best example of how the internet can tie a country's political censorship laws in knots comes from Germany, where it is illegal to sanction, or teach others, how to

commit a crime. The result? Police have decided to charge a left-wing politician called Anna Marquardt for putting a hyperlink on her home page to the site of "Radikal" magazine. Radikal published information explaining how to sabotage railway lines.

This follows an earlier incident where the German police tried to prosecute CompuServe. The crime? As an ISP, it offered access to a Canadian Holocaust revisionist site; denying the Holocaust is also a crime. The case was dropped. Ironically, Radikal magazine itself is safe: its site is hosted just down the road in the Netherlands.

URLs

- MRTA Solidarity Page burn.ucsd.edu/~ats/-mrta.htm
- Shining Path www.csrp.org/csrp.htm
- Mainstream UK politics**
- Conservative Party www.conservative-party.org.uk/
- Labour Party www.poptel.org.uk/labour-party/
- Liberal Democrats www.libdems.org.uk/
- Fringe Parties**
- Scottish Nationalists www.snp.org.uk
- Plaid Cymru www.plaid-cymru.wales.com/
- Referendum Party www.referendum.org.uk/
- Lists of UK political links**
- UK Directory, government section — local and party links for the UK www.ukdirectory.com/gov/index.htm
- UK Political Links — ordered by subject with a site of the week sun1.bham.ac.uk/turnersj/-pollinks.html
- Julian White's British Politics Index — the biggest and best, with more than 1,000 links including temporary sites www.keele.ac.uk/~depts/po/table/brit/brit.html
- Extremists**
- British Nationalists Home Page ngwwmall.com/frontier/bnp/
- Crosstar www.nationalist.org
- Freedom Press www.lglobal.com/TAO/-Freedom/
- Voice of White America members.aol.com/tsaukki/whiteamr.html
- New Communist Party of Britain www.geocities.com/CapitolHill/2853/homepage.html
- Natural Law Party www.u-net.com/~natlaw/
- Educational links**
- Register to vote in Manchester: Steve Coogan and Caroline Ahome (Mrs Merton) show you how. www.manchester.gov.uk/register-to-vote/
- Online election for schools www.campus.bt.com/CampusWorld/election97/



The New Communist Party home page

cause ballot-box politics. Although hardly what you'd call "ready for government", political parties like the Natural Law Party, the Referendum Party and the Third Way are using the web as a cheap way to disseminate information, leaving more money to pay for lost deposits when it's time to vote. Less threatening than the extremist pages, spanning views from the earnest to the charmingly eccentric, they all have one thing in common: they regard the net as a way to right the distortions and jibes of mainstream media.

Who typifies this more than the Natural Law Party, butt of countless Yogic Flying jokes in the 1992 election? Stuart Withers, chairman for the North of England, who helps maintain the party's web site, is enthusiastic against the odds. "We can maintain a regularly updated statement about our policies and campaigns. The international presence is brilliant, as we exist now in 50 countries," he says. "It is sad that the media do not appear to like democracy, in the sense that they do very little to present our case and are very inaccurate when they do. As a result, very few people are aware of our platform."

Withers sees the internet as a minority interest but one that attracts a high calibre of response, and potential activists. He's not in favour of censoring the internet, preferring to try and solve the root problem.



"I can understand that some people are afraid of chaotic situations — they see dangers there. They are right, but they don't understand the mechanisms. The cause of the chaos is incoherent national consciousness. That's why some countries are affected more than others." But what's the solution? "The solution is therefore to create coherence in national consciousness, by establishing groups of yogic flyers." And if you want to know how to do that, you'll have to visit the web page.

So is the web a potential world parliament where we'll thrash out all our problems, agree a solution, do away with governments and still have time for a quick game of deathmatch Quake, or is it a conduit for minority nutters who like to shout loudly?

The Liberal Democrat site is probably the easiest to navigate, even if it is less slick than the other two major party sites

While it's a way to cut through the posturing and soundbite culture to explore the background of world politics, the web doesn't do much to further political debate: when you visit each site, you're effectively listening to one opinion at any time. Because of this, many sites appeal to those who already believe in what they propose — visit the chat area of the Voice of White America for confirmation of this, which isn't a chat, it's a yobbish, racist rant.

On the internet, the medium isn't the message. You can't kiss babies, evade questions or hog the limelight. In some ways, it's a return to the rough, issues-based politics our parents knew. Initiatives like the online election for schools and Steve Coogan's lesson in how to register to vote, mix politics and education. When conventional soundbite campaigning threatens to send you to sleep in this election, the political areas of the web make compelling, amusing, inspiring and appalling browsing. They remind you of what the creators of the net wanted: free and frank discussion. If they're not the most technologically innovative parts of the web, that's because for most sites, content is still more important than packaging. ■

The bare essentials for communicating from abroad

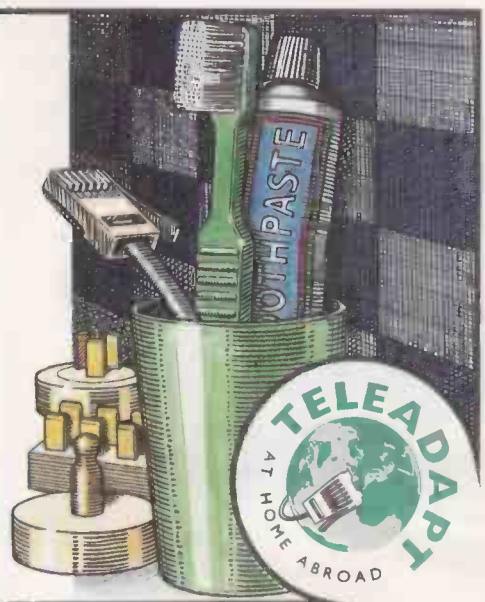
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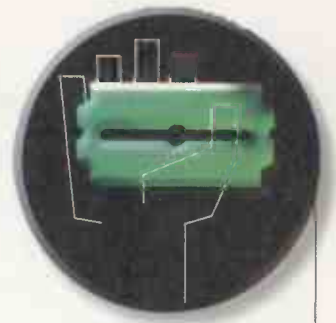
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Data collection

Ian Wrigley, on good form in part II of his teach-in on CGI, delves deeper into common gateway interfaces, explaining how to accept and process information off a web page.

Last month we looked at creating some basic CGIs for counting hits to a particular link on your web page and redirecting users to another location. This time, we'll take CGIs further and explore how to accept and process input from a form — a common requirement, whether you're implementing an on-line guest book (but please don't, they are almost always filled with inane and pointless rubbish!), requesting comments, or creating a complete on-line shopping mall. As with our examples last month, the CGIs presented here will be written in C, simply because it is probably the most common language used for creating CGIs. However, do remember that you're not restricted to C — Perl is another common language, along with many others that are used. Another reason for using C is that there happens to be a rather excellent C library, available free on the internet, that will make your CGI-writing life much easier.

In the library

The library, called `cghtml` and written by Eugene Eric Kim, provides a ton of function calls to accept input from a form, parse it, and process the results. The library also includes plenty of functions that will aid writing out the HTML that you will produce after you have processed the form; all in all, it's an invaluable tool in the C programmer's repertoire. You can find on-line documentation for the library at <http://hcs.harvard.edu/~eekim/web/cghtml/>. The documentation tells you where you can download the actual code; it's available in PKZipped, gzipped and Unix Compressed formats, so you should have no problems obtaining and extracting it.

Once you have compiled the code for

your system, you are ready to go. A good first trial of the system would be to compile and try out the program in Fig 1 (p224). This is a very simple CGI which just prints out the environment variables passed to the CGI.

Although fairly trivial, you can see already that `cgilib` provides some useful features. All the standard CGI environment variables are stored as constants, so you can access them easily from within your program. Just use the `getenv()` system call in C, or whatever is the equivalent in your language. For a simple example, Fig 2 (p224) simply prints out the name of the server, which is stored in `SERVER_NAME`.

Notice that in both programs we have included `cgi-lib.h`, the header file for the routines. In order to actually run the programs, you need to store the compiled code in your `cgi-bin` directory and call it by accessing the URL www.yourserver.co.uk/cgi-bin/yourprogname. If you're having no luck, talk to your system administrator to make sure that you are actually able to access CGIs, because some systems only allow access to a particular subset of programs. Additionally, it's worth noting (at least on a Unix system) that you may well have problems if you try to run either of the programs directly from the command line. This is because until they are called via a



web server, the environment variables are not set; so, at least on a Sun SPARCStation, trying to run the programs directly results in a core dump.

Why on earth would you want to use environment variables such as `SERVER_NAME`? Well, consider a situation where you are dynamically creating URLs to be written into an HTML page created by your CGI; perhaps because the program is a search utility that has catalogued all the pages on your site. The URL needs to be of the form <http://yourserver.co.uk/filename.html>. But if you hard-code the `yourserver.co.uk` bit, your program is not at all portable; move it to a different system and you'll have to edit the source code. But if you use the environment variable instead, suddenly you can move the program to any web site you're maintaining and it will still work. It's all about portability.

On forms

Accessing the environment variables can be useful, but it's in the handling and

p224 >

Fig 1 Printing environment variables

```

/*
 * printenvironment.c version 1.0
 * By Ian Wrigley
 *
 * Prints out the server environment variables
 *
 */
#include <stdio.h>
#include "cgi-lib.h"
int main(void)
{
    printf("Content-type: text/html\n\n"); /* To start the HTML */
    printf("<HTML><HEAD><TITLE>Environment variables</TITLE>
</HEAD>");
    printf("<BODY><H1>The environment variables...</H1>");
    print_cgi_env();
    printf("</BODY></HTML>");
    return 0;
}

```

processing of forms that cgihtml really comes into its own. Before we start, it's worth taking a quick look at the creation of the forms themselves. Fig 3 (p226) contains a typical HTML form; this one asks for your suggestions on the quality of the web site.

There are a couple of things to notice. The first is that two different types of form element are used: a text box for a single-line input, and a text area for multi-line input. The second thing is the line near the beginning of the file which defines which CGI will be called when the "submit" button is pressed, and how the data should be passed to the CGI (the METHOD section).

METHOD matters

It is worth taking a slightly more detailed look at that METHOD tag. You have two basic methods for passing data to your CGI: GET and POST. The former is the easiest to understand but it is rather basic and seldom used for anything but the simplest CGI. If you pass your data to a CGI using GET, it is placed in an environment variable called QUERY_STRING. But things aren't quite that easy; before the data is sent, things like spaces are encoded. Also, since all the form elements need to be passed in the same string, they are concatenated with an ampersand (&) between each "name=value" pair. For example, a form which had two simple text boxes, one called "yourname" and another called "companyname", would, when submitted via GET appear like this:

```

firstname=Ian&companyname=Wide%20
Area%20Communications

```

Although languages like Perl can split such entries into a list fairly easily (using the split() function, if you're interested), C and others will have a harder time. And we've still got to deal with the decoding of bizarre entities like "%20" which needs to be turned into a space.

The other limitation with GET, perhaps the most major one, is that it can only reliably pass 255 characters to your CGI. For that reason alone, it's far better to use the

POST method. This allows unlimited amounts of data to be passed, and although it can be slightly more difficult to access the results, the cgihtml library provides us with some very easy-to-use function calls that make the whole thing very easy. In other words, the recommendation here is to use the POST method for all except the simplest CGIs you write.

Fantastic functions

So let's take a look at the procedures we use to read the data from the form in Fig 3. The CGI to process this data is in Fig 4 (p226) and since it's more complex than any of the ones we used last month, we'll go through it step by step.

First of all, we include cgi-lib.h, since that's the cgilib header file we need. Of course, since we're printing things out, we also need stdio.h.

■ Step 1 in the listing is the first new idea: we define the variable information as being of type list. This is a data type defined in cgi-lib.h and is basically a list that can store the data read-in by the CGI. Don't worry; we never normally need to access this variable directly, since we are given a set of handy functions that operate on the variable.

■ After printing some basic stuff (don't forget to output the content-type line, otherwise your browser will complain) we get to Step 2, where we call the read_cgi_input function. This function takes the input supplied to the CGI (whether it's

Fig 2 Printing out the name of the server

```

/*
 * printservername.c version 1.0
 * By Ian Wrigley
 *
 * Prints out the name of the server
 *
 */
#include <stdio.h>
#include "cgi-lib.h"
int main(void)
{
    printf("Content-type: text/html\n\n"); /* To start the HTML */
    printf("<HTML><HEAD><TITLE>Server name</TITLE></HEAD>");
    printf("<BODY><H1>The server name</H1>");

    printf("The server name is %s", getenv("SERVER_NAME"));
    printf("</BODY></HTML>");
    return 0;
}

```


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supplied via the GET or the POST method), and places it in the variable information. We need to pass the function the address of the variable (hence &information) since a function can't directly alter its parameter variable. (If this doesn't make sense to you, now is probably the time to take a quick refresher in C.)

When read_cgi_input returns, it passes back the number of entries it returned or a zero if it didn't read any. That is why we can put it in the if statement and directly check to make sure that at least one value was returned.

■ Assuming this was the case, Step 3 calls a function print_entries, which simply prints out the name and value of each item in the information list. (A good example of a simple function that actually does some fairly hard work.)

■ If no entries were read, the else clause comes into effect and in Step 4 we print out an error message. Then we just write the end of the HTML document.

A little more control

This is all very well, but normally we'll want to do slightly more than just echo the results of the form to another HTML page; for instance, we might want to take the value of individual form items and do something, depending on their contents.

Fig 5 (p228) does just that: it reads in the form entries from Fig 3 and uses one of them (name) to determine what to output.

Much of the program is very similar to Fig 4, but we introduce a new function call in Step 1. This function is cgi_val() and it simply returns a pointer to the value of the item named as its second parameter. In this case, the whole line states: "Take the list of data called 'information', find out where the string returned as the data for the form element 'name' is being stored, and make variable 'whoisit' point to that location". In other words, when the line is complete, "whoisit" will be pointing to the name entered in the form. It's worth noting that we are not doing any error checking here, but in order to make your CGIs bullet-proof, you need to make sure that some data was actually returned; if none was, the function returns the null string, so that's what you should check for.

The rest of the program is quite prosaic. The strcmp() function is a standard C function call, which returns a zero if the two strings match: if they do, then the HTML page will welcome you, otherwise it will tell

you that it doesn't recognise your name.

The cgi_val() function is extremely handy, and is used all the time when you're writing CGIs. The real point to watch out

for, though, is to make sure that it has returned something useful, rather than the null string: if someone doesn't type any data into the form, that's what you'll get; and if

Fig 3 A typical HTML form

```
<HTML>
<HEAD>
<TITLE>Comments please</TITLE>
</HEAD>
<BODY>
<FORM ACTION="/cgi-bin/processform" METHOD=POST>
<H1>What do you think of our site?</H1>
Your name: <INPUT TYPE="text" NAME="name">
<P>
Your e-mail address: <INPUT TYPE="text" NAME="email">
<P>
Your comments on our site:
<TEXTAREA NAME="comments" ROWS=8 COLS=80>
</TEXTAREA>
<P>
</FORM>
</BODY>
</HTML>
```

Fig 4 CGI to process data from a form

```
/*
 * processform.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates
 * a new HTML page containing the results
 */
#include <stdio.h> /* Of course... */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
    llist information; /* STEP 1 */
    printf("Content-type: text/html\n\n"); /* To start the HTML */
    printf("<HTML><HEAD><TITLE>Results!</TITLE></HEAD>");
    printf("<BODY><H1>Your results</H1>");
    if (read_cgi_input(&information) != 0) /* STEP 2 */
    {
        print_entries(information); /* STEP 3 */
    }
    else
    {
        printf("No input!"); /* STEP 4 */
    }
    printf("</BODY></HTML>"); /* End the HTML */
    return 0;
}
```


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Fig 5 Reading form entries to determine output

```

/*
 * whoareyou.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates a new HTML page.
 * The contents are determined by the value of the variable 'name'
 *
 */
#include <stdio.h> /* Of course... */
#include <string.h> /* for the strcmp() function later */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
    llist information;
    char *whoisit; /* Pointer to be used later */
    printf("Content-type: text/html\n\n"); /* To start the HTML */
    printf("<HTML><HEAD><TITLE>Hello!</TITLE></HEAD>");
    printf("<BODY><H1>Hello</H1>");
    if (read_cgi_input(&information) != 0)
    {
        whoisit = cgi_val(information, "name"); /* STEP 1 */
        if (!strcmp(whoisit, "Ian")) /* STEP 2 */
            printf("Hello Ian!<P>");
        else
            printf("I don't know you!");
    }
    else
    {
        printf("No input!");
    }
    printf("</BODY></HTML>"); /* End the HTML */
    return 0;
}

```

you don't check, your program will probably crash somewhere later on.

There are plenty of other function calls that `cghtml` provides to deal with input from your forms; the on-line documentation lists them all and there are some example programs included in the package to help you understand what's going on. One worth noting is the `die()` function. This allows your program to exit elegantly if a problem occurs, rather than crashing or running forever in the background, taking up processor time and slowing you down.

Signal handling is not pretty in C, but it's very easy to use in simple cases. Just put `#include <signal.h>` and `#include <unistd.h>` at the top of your program, and the following lines in the body:

```

signal(SIGALRM, die);
alarm(30); /* die if processing

```

isn't done in 30 seconds */

Assuming your operating system handles signals, supports the `alarm()` function call and recognises the `SIGALRM` signal, these two lines of code basically call the `die()` function 30 seconds after the program starts. Thirty seconds is far longer than any but the most complex CGI will take, so if it's still running at that time, chances are you have a problem in your code so you should exit as quickly as possible.

Writing out HTML

The `cghtml` library doesn't just provide functions for accepting input, though; `cgi-lib`'s companion library, `html-lib`, has several functions which make writing your output page easier, too. Fig 6 (p230) demonstrates a number of them, and although none are particularly earth-shattering, they do speed life up for you.

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Personal Computer World • April 1997 • 229

Fig 6 Functions for easier writing of an output page

```

/*
 * whoareyou.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates a new HTML page.
 * The contents are determined by the value of the variable 'name'
 *
 */
#include <stdio.h> /* Of course... */
#include <string.h> /* for the strcmp() function later */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
    llist information;
    char *whoisit; /* Pointer to be used later */
    printf("Content-type: text/html\n\n"); /* To start the HTML */
    printf("<HTML><HEAD><TITLE>Hello!</TITLE></HEAD>");
    printf("<BODY><H1>Hello</H1>");
    if (read_cgi_input(&information) != 0)
    {
        whoisit = cgi_val(information, "name"); /* STEP 1 */
        if (!strcmp(whoisit, "Ian")) /* STEP 2 */
            printf("Hello Ian!<P>");
        else
            printf("I don't know you!");
    }
    else
    {
        printf("No input!");
    }
    printf("</BODY></HTML>"); /* End the HTML */
    return 0;
}
/*
 *
 * printpage.c version 1.0
 * By Ian Wrigley
 *
 * Prints out a page using html-lib
 *
 */
#include <stdio.h>
#include <html-lib.h>
int main(void)
{
    html_header();
    html_begin("A sample page"
);
    h1("Hello, world!");
    h4("Text in header 4 style"
);
    html_end();
    return 0;
}

```

The first function call is to `html_header`. This simply prints out the Content-type line for you, so all your programs should include this as the first thing they print. Next, `html_begin` prints out the standard HTML tags `<HTML><HEAD><TITLE>`, then the string you supply to the function, then `</TITLE></HEAD><BODY>`.

Graphical buttons in forms

Rather than using the standard buttons, it's possible to use a picture instead. You do this by using the `<INPUT>` HTML tag, viz

```

<INPUT TYPE="image" NAME="
sendbutton" SRC="sendbutton.gif"
ALT="Send" VALUE="Send">

```

Here, we are saying that the image (`sendbutton.gif`) should act like a button; when clicked, it will send the data to the CGI. Just by using a technique like this you can radically improve the look of your forms, replacing the boring old buttons with cool icons. Even better, you can put two or more graphical buttons on the page and give each a different name. Then you can set your CGI to see whether a given button has been hit.

But wait; how do we do that test? Well, it's our old friend `cgi_entries`. But there's a catch. When you click on a graphical button called, for instance, `sendbutton`, what is actually passed to the CGI is information about where on that button the user clicked, in terms of the x and y coordinates. So you can't just check to see if `cgi_val(information, "sendbutton")` is not null — it always will be, since no entry called `sendbutton` is returned. Instead, two others (`sendbutton.x` and `sendbutton.y`) are passed back, giving the x and y coordinates of the place the user clicked. So to see if the `sendbutton` was pressed, you need to use something like this:

```

if (cgi_val(entries, "sendbutton.x
"))
{
    /* sendbutton was pressed, so
do something */
}

```

Since `sendbutton.x` will only have a value if the user clicked on this button, the `if()` condition will be true and you can carry on.

POW Contact

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Fans of JD Salinger were alerted to his first new book for over 30 years by a buried listing for *Hapworth 16, 1924* on the pages of Amazon.com, the web-based book store.

The publicity-shy author has banned any form of promotion for the new book, which is being published by an independent press. The listing for the new title was among Salinger's other books, including his most famous, *The Catcher In The Rye*.

Hapworth 16, 1924 is not yet available but can be pre-ordered from the Amazon site.

www.amazon.com

ISPs bid to link China

ISPs are bidding to give China its first internet gateway links to the rest of the world, but the country will have its first nationwide intranet by the end of 1997 due to a deal between Bay Networks and Beijing's state news agency.

The deal will cover 20 Chinese cities by the end of the year, expanding to 50 next year. The intranet system will be known as the China Wide Web, with services targeted at businesses rather than individuals.

The intranet will carry business information, email and some web pages, but the construction of a Chinese internet gateway will be awarded to an international ISP once the bids have been assessed. Sources could not

confirm which companies were in the running.

For the China Wide Web deal, Bay Networks will provide the network design, hardware, software and engineers' training, but the company refused to reveal how much the contract is worth.

Up to two million businesses would be interested in the service, according to Michael McLeod, sales and marketing director at China Internet, a company controlled by the Beijing state news agency.

Implementation of the scheme should now be under way in Hong Kong, Shanghai, Beijing and Guangzhou.

James Harding, VNU Newswire

Little Brother is watching you

Remember how your little brother would snitch to your mother when you did something wrong? There is now an electronic version waiting to inform your boss exactly where you have been on the internet.

Little Brother, produced by the Kansmen Corporation, is claimed to be the most advanced web-monitoring software currently available. It allows network managers to see which web addresses

employees visit and the size and identity of any files downloaded from the internet. Plus, if necessary, access to individual sites can be blocked.

The company claims that by empowering individual control of web access it will prevent government action to ban certain web content — porn, for instance. It also sounds like the kind of tool that megalomaniac network managers have been dreaming of, with its ability to

identify who has been where and doing what on the web.

www.kansmen.com

Kansmen
Corporation

net.surf

Peek at the geek



geek-girl.com

Geek Girl is a funky little site, set up by a self-confessed girl geek. As well as being funny, the site also hosts a wealth of techie information including a complete guide to the mysteries of UNIX and beyond.

Geek girls and boys should rush over and thank Geek Girl profusely for such a show of unashamed pride in being a geek. Oh, and by the way, geek boys... she's attached.

www.geek-girl.com/

Castanet clicks with Dimension X

The next step for "pushed" information across the web will include Java-based applications as well as the familiar stock-tickers and news headlines accessible through PointCast and similar services. Two companies, Marimba and Dimension X, have joined forces to make the creation and delivery of Java applications easier for software developers who are keen to take advantage of web delivery.

Marimba has developed Castanet, a system for broadcasting data and applications across the internet, direct to users' personal computers. It also markets Bongo, a Java-based visual development environment for creating GUIs that needs significant Java experience in order to build complete applications.

Dimension X has developed its Liquid Motion Pro software which offers point-and-click Java programming to work with Bongo. Both companies hope that the combination will make it easier for designers to create exclusive applications for delivery on Castanet.

This is more evidence of a gradual shift to Java-

based computing using the internet or TCP/IP-based intranets. Desktop users can "tune in" to Castanet and then select the applications (or "channels") they need from a menu.

Marimba claims that the Castanet protocol makes it possible to distribute large, media-rich applications even over a slow connection. Once applications have been downloaded, they can be stored on local drives.

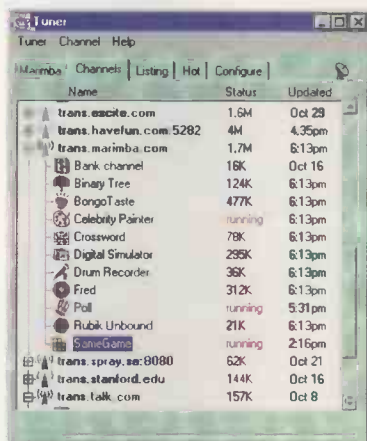
Corel is to deliver forthcoming beta copies of Corel Office for Java via Castanet channel technology, making it easier for testers to obtain the latest version.

A beta version of Bongo and the Castanet tuner are available from the Marimba web site.

www.marimba.com/

www.corel.com

www.dimensionx.com



Global offers free web space

Global Internet has announced that it is to give its customers 3Mb of web space, free. To access the pages, customers add their user-ID to a predetermined web address. They are then guided through a tutorial for online creation of web pages.

"We've made it easy and cost effective for them to create their own web site," said Laurence Blackall of Global Internet.

www.globalnet.co.uk



Trouble brews down at the net café

The managing director of an internet café in Cheltenham, called "Netscafe", has run into trouble with the Swiss food giant Nestlé over its name. He has received a fax from the Nestlé company which alleges infringement of copyright.

Managing director, Paul Alexander said: "I contend that this is not the case. Refreshments make up less than five percent of the business. I supply tea, coffee, soft drinks and refreshments; I do not serve Nescafé."

He also contends that none of his customers have made the mistake of thinking that the café was in any way connected with Nestlé, despite the company's claim that the café's name could confuse its customers. Mr Alexander is now seeking further advice.

www.netscafe.co.uk

MacroMedia plugs in to FutureWave and gets Flash

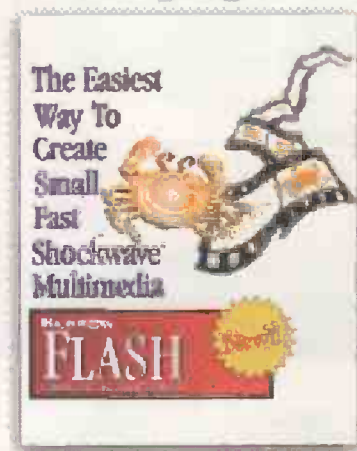
Following the trend of large software companies swallowing innovative web software houses, MacroMedia has acquired FutureWave and has re-launched Flash, its class-leading web-animation tool. It now joins MacroMedia's growing stable of web design products.

Flash allows creation of small animations that download faster than those created conventionally. It is designed to create and animate high-resolution vector graphics or import them from other graphic design tools like Adobe Illustrator or MacroMedia FreeHand.

For web users the Flash plug-in means that animations come down the web much faster, and should make animated sites worth viewing for those with limited modem access to the internet.

One of the keenest users of Flash has been Microsoft: its MSN site makes considerable use of it, as does CNET and the official "The Simpsons" site.

The Shockwave Flash player is 100Kb and freely available to web users from



the MacroMedia web site.

For developers, Flash is available now at a cost of £229 (plus VAT).

www.macromedia.com/software/flash/

p235 >

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Computer Buyer February 1997, Pentium Desktop Review



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PC Advisor Notebook Review Feb 1997

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RESULTS FROM PC WORLD BENCH SCORE IN PC ADVISOR FEB 1997, NOTEBOOK REVIEW, ISSUE 17



Computer Shopper - February 1997

"You will notice from the results that this is one of the best performing systems in this review. The build quality is high, the performance good and the price attractive given the type of display. XXXX is good value and offers better performance as a 133Mhz machine, but still doesn't match up to the notebook offered by HM Systems."



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PC Plus, November 1996

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IBM files patents site

HOping to demonstrate the practical applications of its own internet products, IBM has opened a free public web site holding two million US patent filings dating back a quarter of a century.

The database was developed by IBM for internal use by its own lawyers, to speed up the process of patenting its own innovations. But it decided to open up the Patent Server to outsiders as a demonstration of its technology and, it claims, as a public service.

The US Patent and Trademark Office offers abstracts of patents free of charge on the internet, but charges a fee to make the full text available. "[The Patent Server] saved us time and money," said Marshall Phelps, IBM vice-president for intellectual property and licensing, "so we thought it would be a valuable resource for the public as well."

At present, users accessing the server at www.ibm.com/patents can view a million patent documents dating back to 1987. Documents dating back to 1974 will

be added during the next few months, with the eventual intention of offering patents from 1971 onwards. Full text search facilities, international patent filings and links to other patent data providers will be added over time.

IBM hopes that, if successful, the Patent Server will act as a practical demonstration that large databases can be hosted on the internet to be shared by large numbers of users. The company has provisional plans in place to post a second database, holding filings from the Federal Election Commission: in UK political terms, the equivalent of the register of Members' interests.

Meanwhile, at the Internet World 97 trade show in Canada, Mark Greene, IBM vice-president of electronic payments and certification, predicted that the company's internet-related product lines would break even this year with e-commerce proving to be the main driver.

Stuart Lauchlan, VNU Newswire

Intranet gets HiP with SoftQuad



SoftQuad has released the final version of its intranet package, HiP (HoTMetal Intranet Publisher). It moves the Canadian HTML specialists into the competitive groupware market. Building on its experience developing industrial strength HTML and SGML tools, SoftQuad is pitching HiP as a fully HTML-compliant intranet product for document distribution.

To turn standard HTML files into HiP documents, JavaScript is added to each page (which can be done using a batch file for large sites) and this activates the HiP plug-in reader. It splits the browser window

into two panes: on the left is a Table of Contents (TOC) of the document, while the right-hand pane continues to display the normal web page.

HiP allows context-sensitive searches of the document instead of a normal sequential search on the web. Intranet users can get automatic updates for the web site using different parameters. For instance, a topic update defined by the user would alert them to new changes anywhere on the site. Users can also annotate documents after viewing them, and redistribute them on the intranet. Documents can also be given an "effective from" date or expiry date so that they only remain active on the site for a certain time.

For site managers HiP provides tools which are accessible remotely via FTP, and a colour-coded graphical representation of the site can be used to check broken links and identify documents. The package includes a copy of HotMetal Pro for web-page creation. SoftQuad is now developing version 4.0 of HoTMetal with a target release date for the end of 1997. Pricing for HiP starts at £349, with a ten-viewer pack (the plug-in) at £125.

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Web developer proposes bandwidth islands concept

A solution to the bandwidth limitations currently restricting development of net telephony and online shopping could be the "bandwidth islands" idea, proposed by new media publisher and web developer, Steinkrug.

The company sees potential for conventional content providers, like local newspapers and supermarkets, which are eager to

tap into new markets selling services and advertising. While for the community, low-cost video-conferencing across the network could, for example, link GPs with their patients at home.

Such "islands" would, in effect, be private networks or community intranets with normal net protocols but, because they are isolated, not subject to the bottlenecks and

bandwidth squeeze that afflicts the global internet.

Steinkrug's Peter Kruger said: "A local business magazine is one of the first clients to whom we are talking, and we have talked to several other newspapers."

The idea for bandwidth islands arose from research into community networks, funded by the EU.

www.gold.net/flames/

Notes.net

Lotus is the latest company to offer an offline browser with its release of Weblicator, available for download from the Lotus web site. But because of Lotus' work in developing Notes, and its Domino web server for intranet applications, Weblicator is designed to do more than just grab web sites for browsing offline. Lotus sees it as a way of boosting productivity by allowing employees to participate in web-based business applications, offline. For example, group workers can pull applications like spreadsheets or HTML documents off servers, modify them, then put them back on the server. The changes can be assimilated by a manager and passed on to the next person in the intranet chain.

Weblicator also offers standard offline tools, full-text searches of web documents and an HTML-based user interface, allowing users to personalise web documents.

Weblicator is \$29 and runs on Win95 and NT and any browser that supports frames.

beta.notes.net

Apple offers MacOS JVM compatibility



Apple has released an implementation of Sun Microsystems' Java Virtual Machine (JVM), the software set needed to run Java applications under MacOS. Called MacOS Runtime for Java 1.0, it includes a player for running Java applications and an API for developers. This makes Apple and IBM the only manufacturers to offer JVM compatibility as part of their operating systems.

A QuickTime Plug-in for both Netscape Navigator and Internet Explorer is now available from the Apple web site. The plug-in supports the QuickTime VR "URL Hot Spot" feature as well as offering web developers control over QuickTime playback. They can define exact volume levels, movie scaling and local caching of files.

www.quicktime.apple.com

Motorola trials faster cable modem

Motorola claims success having tested 200 CyberSURFER cable modems across the Manchester Nynex franchise area. Up to 10Mbps was available to subscribers on this network, making downloads faster than standard modems.

Now Motorola is aiming to extend this service by making cable modem

access to the internet the norm. A new trial is taking place among 100 homes and small businesses in Basildon, Essex. The cable operator is Telewest.

Motorola says the UK cable industry is so advanced it could take a world lead in offering super-bandwidth to ordinary homes. The

UK has state-of-the-art hybrid fibre coax pipe that supports bi-directional communication. In comparison, only 18 percent of US networks are so equipped.

Bi-directional communication is important for developing interactive web applications like web TV, video-conferencing and home shopping.

top ten websites

- 1 Spice Girls
- 2 FHM
- 3 No Sex, No Money, Just Football FC
- 4 The Computer Superstore
- 5 Cheap Flights
- 6 Damon Hill's Formula 1 Home Page
- 7 UK Laughter Links
- 8 British Airways Global Check-In
- 9 EasyJet Airline
- 10 Exchange and Mart

Chart as at 23/1/97. For the latest chart go to www.yell.co.uk. Yell's chart is based on the most popular web sites that Yell's visitors jump to.





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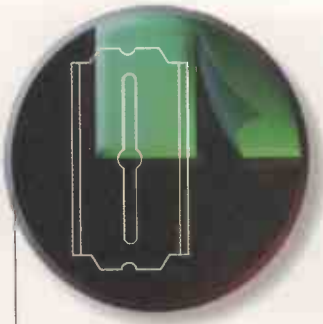
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Target practice

Nigel Whitfield explains the ins and outs of target attributes and how they tell the browser where to open a link. Plus erratic email speeds, where to chat and other net notes

Q

"I am working on a web site and am encountering difficulties with frames. If I click on a link in a frame, the site it links to turns up within the frame or in a separate window, never covering the same window whole."

A. It sounds like you're not using the TARGET attribute in your web pages, which tells the browser where to open a link. There are some special options that can be used with this attribute to tell the browser whether to open the document in the current frame, a new window, or to collapse the current frame set to a single window.

Use the TARGET attribute like this, when you're specifying a link:

```
<a href="http://some.place/page"
target="targname">
```

Replace "targname" with the name of the frame that you want to load the page into, or "_self" to load it into the same frame, "_top" to load it into the full browser window, "_blank" to open a new browser window, and "_parent" to use the parent frame set of the current frame.

Home

Q "I am a new user of the internet from home, although I previously had the luxury of a speedy connection through my university service provider. Now that I am with CompuServe, accessing web pages from home can be painfully slow. My telephone line is shared with ordinary phones and an answerphone/fax machine. Is it possible that the latter, which is actively listening on the line during computer modem operations, could be slowing down transmission rates?"



A. No. It's quite unlikely that anything else on your phone line would be interfering with a modem in that way. However, you should check the REN — Ringer Equivalence Number — of everything plugged in and check that it doesn't exceed four, which is the recommended maximum. Even so, the only usual effect of exceeding a REN of four is that the phone won't ring properly. It's more likely that you're simply experiencing problems with CompuServe, especially since you had fast access through the university. It may be worth downloading the latest version of the CompuServe software, which you can access via GO CIMSOFT.

Own-blend software

Q. "I am having trouble finding an ISP who has access in both the UK and Canada, and who will allow me to use my own blend of software. CompuServe said that it would be against my contract to use my own

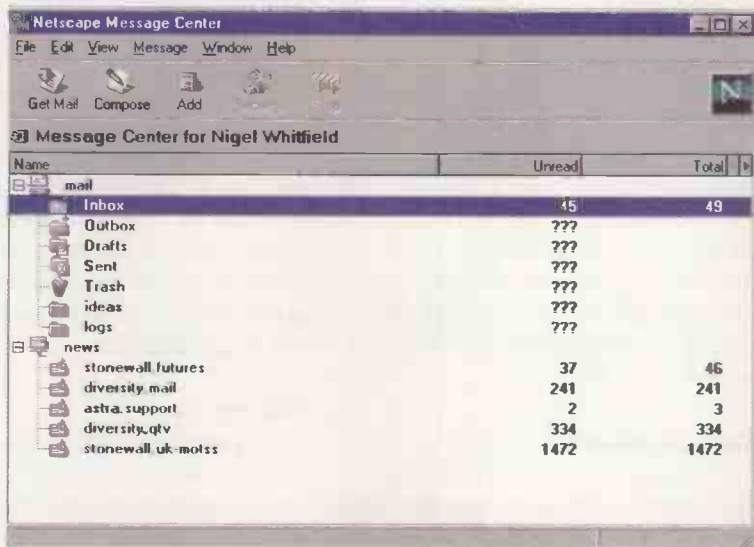
software. I am sure a lot of people have the same problem. Can you help?"

A. You seem to have been rather misled by the people you spoke to at CompuServe. The service can be used with any standard TCP/IP software — in fact, there's even a script on the Windows 95 CD that allows you to use Windows Dial Up Networking to connect to the internet via the service.

If you're after international access, you should consider the Microsoft Network and the IBM Global Network, both of which are available in the UK and Canada; although if you wish to use your own software, IBM may be a better option. You may also wish to check with some smaller ISPs and see whether or not you'll be able to arrange the sort of access that you need by using a different company in each country.

If you collect your email via POP3, there's no need to use the same provider,

NetScape Communicator's email can tell you what's in your mailbox without having to download all the messages



since you can pick up your messages from anywhere, via any ISP. By shopping around for an ISP in each country, you may find a low-cost option that suits your needs better.

Light out

Q. "I currently use Eudora Light 1.5.2. which was supplied by my internet provider. As a newbie I only use it for simple messages, yet two irritating "faults" and one "lack" have given rise to the following wish list :

1. I wish I could Check Mail and Send during the same connection.
2. I wish I could stop the prog determinedly redialling until a connection is achieved (Stop button offered is ineffective).
3. I wish the system could flag that I have mail waiting to be collected, before I attempt to connect.

Obviously, my frustration is in direct relation to the number of people also trying to connect at the same time. Is there a mail system that would satisfy my wishes?"

A. To address your points in turn; you won't be able to find a program that actually collects mail and sends your new messages at the same time, since the way that a mail program like Eudora works means there have to be two distinct connections made. However, having said that, there are some programs that give the impression of doing both at the same time, including the Internet Mail service for Microsoft Windows Messaging. If you're running Windows 95 you can install this service from the Windows 95 CD, if you bought it with a new machine, or download it from the Free Software section of the Microsoft web site — choose "Product" then "Free download" and "Windows 95 Updates" from the main

page. When it's installed, choosing the "Deliver now using Internet Mail" option will send your outgoing messages and retrieve any that are waiting on the internet provider's computer.

The redialling problem isn't strictly related to Eudora. When the program tries to collect your messages, it opens a connection to the mail server. With a dialup connection, your WINSOCK.DLL file will automatically try to dial the internet provider, before returning to Eudora and saying that the connection has been made (or couldn't be made). Until this happens, the Stop button won't do anything, since control has passed from Eudora to the network software that's opening the connection.

The real solution lies in configuring your TCP/IP software so that it doesn't redial as many times to establish a connection, which will enable it to return control to Eudora more swiftly so that the Cancel button is recognised.

Finally, checking how much email you have before connecting isn't something that's possible, although some programs will allow you to retrieve the headers of messages first and then decide which ones you want to transfer to your computer. One is NetScape Communicator, which you can download from home.netscape.com

Trying to get through

Q. "I have only one phone line. Is there any software that could inform me of a caller trying to ring me when I'm using the line for my internet connection?"

A. No, there's not. The only way to know when someone is trying to call you is to use call waiting, but the tones that it produces

p240 >

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disrupt modem calls and you'll almost certainly lose the connection.

An alternative is the CallMinder service from BT, which can take a message from callers when your line is busy and will tell you when you finish your internet connection that there are messages waiting, but the real solution to your problem is to have two phone lines. It may be worth checking with your local cable TV company to see if they are able to offer a cheap installation deal on an extra phone line.

Message received, but slowly

Q. "When I send email to my friends over the internet, sometimes it's really fast, but at others it's very slow. We've looked at the Received: headers in the messages, and the messages don't even travel by the same route all the time. Why is this?"

A. When you send email over the internet, messages aren't necessarily passed directly to the computer that the address is on. It might not be a real computer, or it could be on a network other than the net, or it might not be connected at the time you send your message, like a dial-up net connection.

To cover these eventualities, the internet's Domain Naming System (DNS) has a section called MX (Mail Exchanger) records. These say which computer on the internet receives mail on behalf of another computer, or a whole domain.

When you send email, the mail system looks up the MX record for the address that you're trying to reach and passes your message to the nominated computer. Most addresses on the Internet actually have more than one MX record, and each one has a preference. If the computer trying to send email can't reach the one with the highest preference, it will try the others instead. Computers are often set up so that when they have more than a certain amount of work to do already, they'll refuse connections for any more email messages.

It's a combination of these factors that results in your messages taking different routes each time they're sent. Often, an internet provider will arrange to have at least one MX record for his customers on systems that are elsewhere, so that if his network is cut off, mail can be held without being rejected until the problems are fixed.

Taking all this together, it means that your messages are most likely being delayed because of heavy traffic on one of the main MX systems for the recipient,

resulting in them being routed to different computers, introducing extra hops and consequently slowing them down.

There's not really anything to worry about, unless they routinely take a long time. The way in which different systems are tried is part of what makes the internet resilient, ensuring that the failure of a single computer isn't going to stop messages getting through, although they may take a little longer sometimes.

Chat lines

Q. "I've heard about the chat systems on the net. How do I access them, and how do I find out where there are people chatting about the topics that I'm interested in?"

A. The main chat system on the internet is called Internet Relay Chat, or IRC. It's divided into channels, each of which usually has a descriptive name. You need an IRC client for your computer, such as mIRC for Windows and Irle for the Macintosh, and then you have to tell the program which IRC server to connect to.

IRC servers receive the messages that you type and pass them on to other servers, where they're sent on to people who are using the same channel. Not all the IRC servers talk to each other, and there are a number of different IRC networks. The two largest are EFnet and IRCnet, of which the latter tends to have more people in Europe and the UK, while EFnet is predominantly American. Although there are some channels for UK discussions on both networks, #gb for instance, they're completely separate: someone needs to be on both the same network and the same channel to see what you're typing.

When your IRC program asks for the name of a server, the one you choose will determine which network you're connected to. In the UK, Demon Internet runs two public IRC servers: efnet.demon.co.uk is connected to EFnet and ircnet.demon.co.uk is connected to IRCnet.

The first thing to do when you're connected is probably to use the help command. All IRC commands begin with a / and most programs access some of the same ones. For instance, "/join #gb" will take you onto the #gb channel. "/quit" finishes your session, and "/msg name hello, how are you" would send the message "hello, how are you" to the IRC user called "name", rather than displaying it to all the other people on the same channel.



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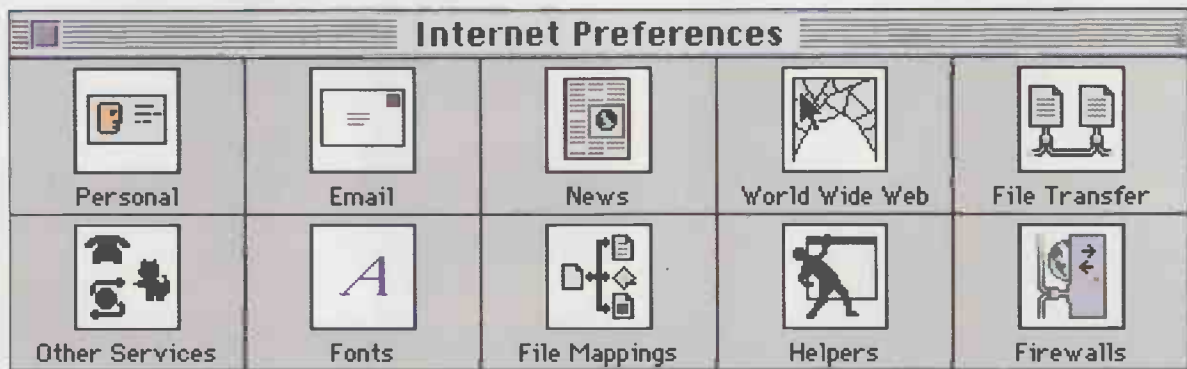
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POP goes the Demon

Q. "I'm trying to choose an internet provider and I want to use the software that I already have, which collects email via POP. Friends have told me that I can't use that sort of software with Demon Internet, but I want to take advantage of their free web space.?"

A. Don't worry too much about the web space. Although there are a couple of features unique to Demon's offering, if it's just size that's important to you, then there are a number of other providers that also give away five megabytes of space.

Your friends were correct in their comments about Demon's email service, which uses SMTP to deliver email instead of POP. That used to mean that if you wanted to use a POP email program to collect email from Demon, you'd need an extra piece of software to collect the SMTP mail first.

That's no longer true, as Demon now gives everyone the choice of collecting their email

via SMTP or POP3. If you want to use your existing mail software, just tell it to collect messages from pop3.demon.co.uk and send them via post.demon.co.uk. For your user name, you should use the name of your Demon node, and your usual password. Doing that will retrieve all the messages for all the users of your Demon account. If you just want to collect messages for a single person, you can tell your software to use their name, followed by a plus, and then your nodename when it connects to the POP server. For instance, to collect just the mail for net.answers@stonewall.demon.co.uk, I'd use the user name net.answers+stonewall. Full details of the new mail system are on Demon's web site.

Figuring out Internet Config

Q. "I've downloaded Internet Explorer 3 for the Macintosh, and it offers me the option of installing "Internet Config." Should I install this, and what does it do?"

A. Internet Config is an application that saves preferences for most internet tasks like email, news, ftp and web browsing. It's not strictly necessary, but if you use it then lots of different programs can pick up the information that they need from there. For instance, with Internet Config, if you change your email address, you only need to do it once and all the programs that are aware of it will automatically use the new one.

It can make things much easier to set up, but remember, you'll still have many options that can only be chosen in the appropriate applications, so it's not a universal cure-all.

PCW Contacts

Nigel Whitfield is a freelance journalist and maintainer of several internet mailing lists. You can send questions to net.answers@pcw.vnu.co.uk, but a personal reply to every query cannot be guaranteed.

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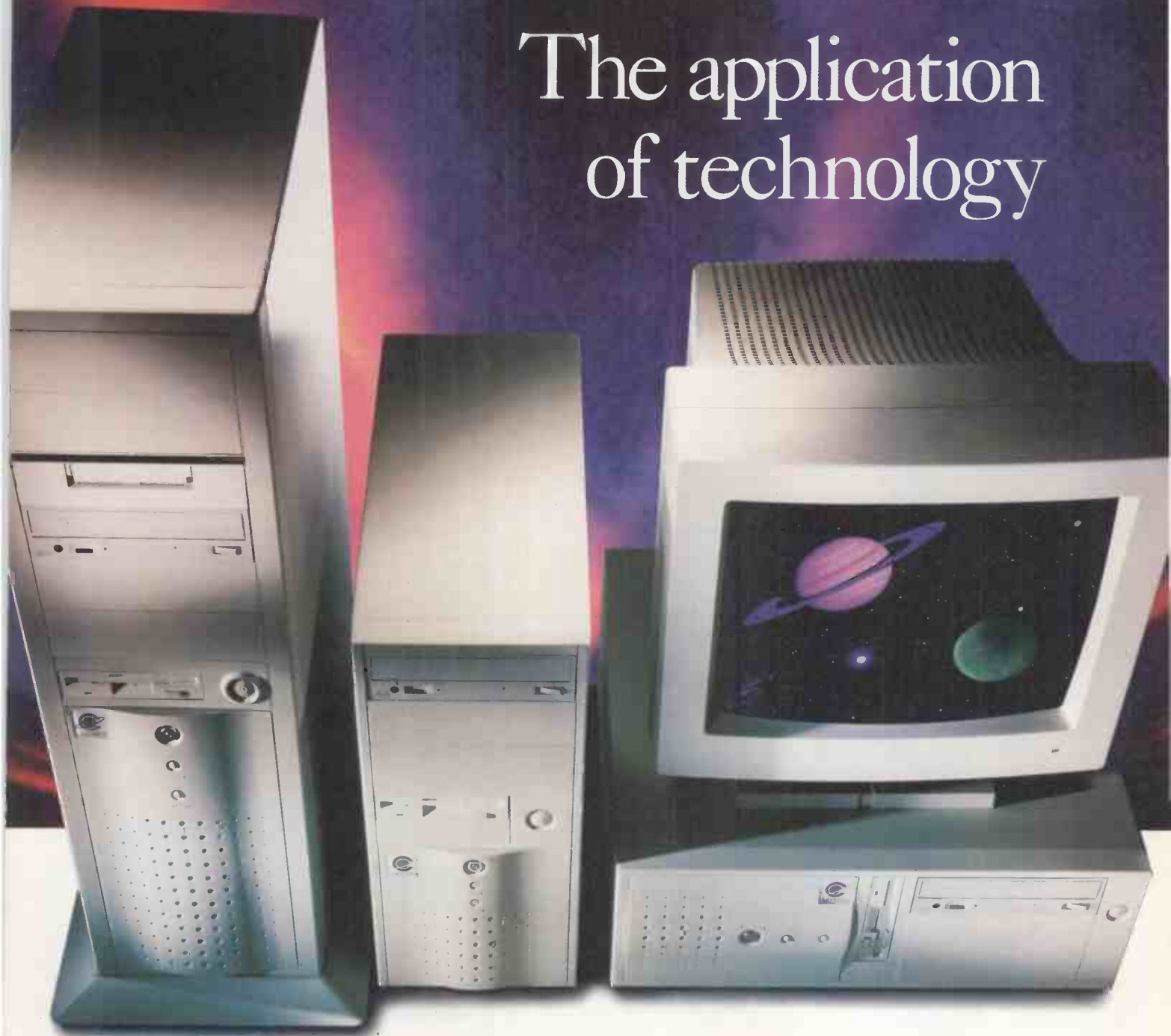
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- 256k Pipeline burst mode external CPU cache
- Software MPEG for viewing MPEG-I videos
- Intel Socket 7 and advanced 'plug and play' motherboard
- Support for flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller.
- 3 Free PCI and 4 ISA expansion slots
- Two 16550 compatible UART driven high speed serial ports
- EPP and ECP capable enhanced bi-directional parallel printer port
- PS/2 Mouse port
- 64-Bit integrated graphics with video acceleration optimised for Windows® 95, switchable to use 2Mb RAM for video
- Integrated 16-bit stereo sound card
- 3.5" 1.44Mb Floppy drive
- Colossus 7 bay desktop case with 210W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard & Microsoft® compatible mouse
- 14" SVGA colour screen
- 4W Stereo speaker system
- Microsoft Windows 95 with manuals and CD, SmartSuite 96, Quicken, and SmartPics, GSP Pressworks and Designworks
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years



Colossus P166+ Performance MT

£1173.83 inc.VAT £999 +VAT

- 6x86 P166+ processor manufactured by IBM/Cyrix
- Upgradeable to Intel Pentium® 200MHz with MMX™ Technology
- 32Mb EDO expandable to 128Mb
- 2.1Gb Enhanced IDE hard disk
- Eight speed IDE CD-ROM drive
- 256k Pipeline burst mode external CPU cache
- BAPT approved 33.6 fax/data/Internet internal modem
- 15" NI.28dp low radiation SVGA colour screen
- Software MPEG for viewing MPEG-I videos
- Intel Socket 7 and advanced 'plug and play' motherboard
- Support for flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller
- 3 Free PCI and 4 ISA expansion slots
- Two 16550 compatible UART driven high speed serial ports
- PS/2 Mouse port
- EPP and ECP capable enhanced bi-directional parallel printer port
- 64-Bit integrated graphics with video acceleration optimised for Windows 95, switchable to use 2Mb RAM for video to increase resolution/colours
- Integrated 16-bit stereo sound card
- 3.5" 1.44Mb Floppy drive
- Colossus 7 bay midi tower case (see opposite page) with 210W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard & Microsoft compatible mouse
- 15W Stereo speaker system (mains powered with A/C adaptor)
- Microsoft Windows 95 pre-loaded with manuals and CD
- Lotus SmartSuite 96, Quicken and SmartPics pre-loaded
- GSP Pressworks and Designworks pre-loaded suite
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years

P150 Performance DT: with 15" NI .28dp screen, and 15W mains powered stereo speaker system ___ +£60+VAT extra (£70.50)

Built for performance

There are three primary criteria on our agenda when we design our PCs at Colossus

1. Performance
2. Performance
3. Performance

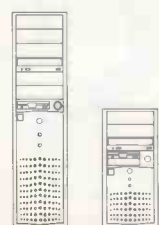
so, its not surprising that our systems continue to receive awards for outstanding performance.

Our new P150 DT comes standard with 16Mb EDO RAM, large 2.1 Gb hard disk, eight speed multimedia and 33.6 fax/data/Internet modem at just £899 + VAT (£1056.33 Inc VAT).



Expandable Case Designs

Our systems feature our new re-designed case styles with small footprints yet incredible expansion potential. All feature security locks, reset button and heavy duty 210W or 230W CE approved power supplies.



- Desktop case has standard footprint, yet seven drive bays (three 5.25" accessible, one 3.5" accessible and three 3.5" internal) 16.8" W, 16.53" D, 5.74" H
- Midi tower case is the most popular and features seven drive bays (three 5.25" accessible, two 3.5" accessible and two 3.5" internal) 6.69" W, 16.14" D, 14.96" H
- Full tower case used in our high performance systems features larger power supply and nine bays (Six 5.25" accessible, one 3.5" accessible and two 3.5" internal) 7.56" W, 18.19" D, 24.4" H

High Performance Motherboards

In the heart of our most powerful systems lies the highest performance motherboards available.

- Latest Intel 430HX chipset with ZIF (Zero Insertion Force) Socket 7 (permitting access to Intel's upgrade path)
- 512k Pipeline burst mode cache with support for flash upgradeable BIOS and faster EDO RAM (only useful if pipeline cache is fitted)
- Full implementation of standard performance components such as enhanced IDE fast mode 4 interface, 16550 fast serial ports, advanced parallel ports & plug and play.

64-Bit PCI graphics are integrated on our entry level systems which also feature high performance SIS chipset. The graphics on these systems use 1Mb of system RAM.

Ultimate 64-bit Graphics

Our popular systems feature fast 64-bit integrated graphics with truly excellent levels of performance through 64-bit CPU access to graphics data. This superb graphics system also provides fast 2D Windows acceleration, video acceleration for video playback, with software MPEG-I and on 16Mb systems can be switched to use 2Mb RAM for video giving higher resolution/more colours at no extra cost.

Our top of the range models feature ATI Rage II 3D, with 4Mb SGRAM providing excellent performance, 3D and video acceleration.

High Capacity Storage

- Hard disks: All our systems feature the latest enhanced IDE hard disks with on board cache. Popular capacities are 2.1 Gb and 3.2Gb.
- CD-ROM: All systems feature a fast IDE eight speed or 12 speed CD-ROM drive.

Unique Sound Capability

All our popular multimedia systems feature quality integrated 'plug and play' 16-bit sound with low noise to signal ratio. System 97 features the latest SoundBlaster 32 wavetable 'plug and play' sound card.

Fast 33.6 Modems

All of our systems come with high performance 33.6 internal modems.

Superb Screens

All systems come with high quality crisp sharp screens with 0.28 or lower dp, low radiation and non-interlaced fast flicker free refresh rates giving a superb Image.

Colossus P166 MMX Multimedia MT

£1408.⁸³ inc.VAT £1199 +VAT

- Intel® 166MHz Pentium® processor with MMX technology
- Upgradeable to Intel Pentium® MMX™ 200MHz
- 32Mb EDO RAM expandable to 128Mb
- 2.1 Gb Enhanced IDE hard disk
- Eight speed IDE CD-ROM drive
- 256k Pipeline burst mode external CPU cache
- Software MPEG for viewing MPEG-I videos
- BAPT 33.6 fax/data/ internal modem
- 15" NI .28dp low radiation SVGA colour screen
- Intel Socket 7 and advanced 'plug and play' motherboard
- Support for flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller can control up to four drives
- 3 Free PCI and 4 ISA expansion slots
- 2 16550 Compatible UART driven high speed serial ports
- PS/2 mouse port
- EPP and ECP capable enhanced bi-directional parallel printer port
- Integrated 16-bit stereo sound card
- 3.5" 1.44Mb Floppy drive
- 64-bit Integrated graphics with video acceleration optimised for Windows® 95, switchable to use 2Mb RAM for video to increase resolution/colours
- Colossus 7 bay midi tower case with 210W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard & Microsoft® compatible mouse
- 15W Mains powered active stereo speaker system
- Microsoft Windows 95 with manuals and CD
- Lotus SmartSuite 96, Quicken v5 and SmartPics pre-loaded
- GSP Pressworks and Designworks pre-loaded
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years



Colossus P200+ System 97 I

£1526.³³ inc.VAT £1299 +VAT

- 6x86 P200+ processor manufactured by IBM/Cyrix
- Upgradeable to Intel Pentium® 200MHz with MMX™ Technology
- 32Mb EDO RAM expandable to 128Mb
- 3.2Gb Enhanced IDE hard disk
- Twelve speed IDE CD-ROM drive
- 512k Pipeline burst mode external CPU cache
- BAPT 33.6 fax/data/Internet internal modem
- 15" NI .28dp low radiation SVGA colour screen
- Software MPEG for viewing MPEG-I videos
- ATI Rage II 3D graphics card with 4Mb SGRAM
- SoundBlaster 32 Wavetable sound card
- Intel Socket 7 and advanced 'plug and play' motherboard
- Intel Triton 430HX chipset with support for flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller can control up to four drives
- 3 Free PCI and 4 ISA expansion slots
- 2 16550 Compatible UART driven high speed serial ports
- PS/2 mouse port
- EPP and ECP capable enhanced bi-directional parallel printer port
- 3.5" 1.44Mb Floppy drive
- Colossus 7 bay midi tower case with 210W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard & Microsoft® compatible mouse
- 15W Mains powered active stereo speaker system
- Microsoft Windows 95 with manuals and CD
- Lotus SmartSuite 96, Quicken v5 and SmartPics pre-loaded
- GSP Pressworks and Designworks pre-loaded
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years



Built with 32Mb RAM

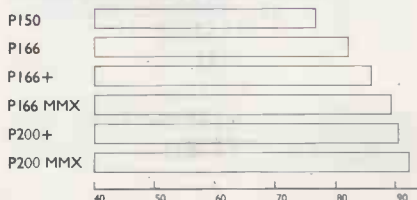
For the best performance in Windows 95 with smooth multi-tasking we recommend 32Mb RAM. Real life performance tests show better overall performance with a 32Mb P166 system compared to a 16Mb P200 MMX system.



Fastest Processors

All Colossus systems use Intel Pentium or IBM/Cyrix 6x86 processors. All our motherboards feature Intel socket 7 which will take processors from 75MHz to 200MHz. Systems using intel's new Pentium Pro processor are currently more suited as file servers or for 32-bit software such as Windows NT and are actually slower than Pentium processor based systems when running typical Windows 95 applications. We also offer Pentium Pro Systems bundled with Windows NT 4.0. All Pentium and 6X86 systems are upgradeable to MMX™ technology.

Relative Windows 95 performance



Based on Ziff-Davis Winstone 96

32Mb System RAM

Amount of system RAM is more important than type of RAM. If you are on a tight budget, we strongly recommend 32Mb RAM in preference to a faster processor. Windows 95 usability tests show better productivity and performance with 32MB RAM.

Business Software

Most of our best buy models come with an excellent range of top quality business software.

Lotus Windows 95 software suite with on-line documentation is pre-loaded on most systems and includes

- Lotus Word Pro 96 for Windows 95
- Lotus Approach 96 for Windows 95
- Lotus 1-2-3 v5 for Windows
- Lotus Freelance graphics
- Lotus Screencom recorder
- Lotus Organizer v2.1 for Windows
- Lotus SmartPics graphics

General Software

- GSP software suite including Pressworks desktop publisher, Designworks graphics package
- Quicken v5 personal finance pack

Leisure/Multimedia Software

In order you may enjoy the multimedia capabilities of these systems immediately, we include a range of 10 CD multimedia packages which include:

- Comptons 1997 encyclopedia
- BodyWorks v5
- Compton 1997 World atlas
- Key CAD Pro
- Project Manager Pro
- Multimedia Bookshelf
- Labels unlimited
- Gizmos & gadgets
- Read write & type
- Infopaedia UK encyclopedia

7COLDP4B

Colossus P200+ System 97 2

£1761.33 inc.VAT £1499 +VAT

Midi tower

- 6x86 P200+ processor manufactured by IBM/Cyrix
- Upgradeable to Intel Pentium® 200MHz with MMX™ Technology
- 32Mb EDO RAM expandable to 128Mb
- 3.2Gb Enhanced IDE hard disk
- Twelve speed IDE CD-ROM drive
- BAPT 33.6 fax/data/internet modem
- 512k Pipeline burst mode external CPU cache
- ATI Rage II 3D graphics card with 4Mb SGRAM
- SoundBlaster 32 'Plug and play' hardware wavetable sound card
- 17" NI .28dp low radiation SVGA colour screen
- Intel socket 7 and advanced 'plug and play' motherboard
- Intel 430HX chipset with support for Flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller can handle up to 4 drives
- 3 PCI and 4 ISA expansion slots
- 2 16550 Compatible UART driven high speed serial ports
- PS/2 Mouse ports
- EPP and ECP capable enhanced bi-directional parallel printer port
- 3.5" 1.44Mb Floppy drive
- Colossus 7 bay midi tower case with 210W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard and Microsoft compatible mouse
- Powerful 70W stereo speaker system
- Microsoft Windows 95 with manual
- Lotus SmartSuite 96, Quicken v5 and SmartPics pre-loaded
- GSP Pressworks and Designworks pre-loaded
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years

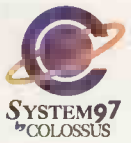


Colossus P200 MMX System 97 3

£1878.83 inc.VAT £1599 +VAT

Full tower

- Intel® 200MHz Pentium® processor with MMX™ technology
- 64Mb EDO RAM expandable to 128Mb
- 3.2Gb Enhanced IDE hard disk with
- Twelve speed IDE CD-ROM drive
- BAPT approved 33.6 fax/data/Internet internal modem
- 512k Pipeline burst mode external CPU cache
- ATI 3D Rage II graphics card with 4Mb SGRAM
- SoundBlaster 'Plug and play' hardware wavetable sound card
- 15" NI .28dp low radiation SVGA colour screen
- Intel Socket 7 and advanced 'plug and play' motherboard
- Intel 430HX chipset with support for flash BIOS and EDO RAM
- Fast PCI enhanced IDE mode 4 hard disk controller can handle up to 4 drives
- 3 PCI and 4 ISA expansion slots
- 2 16550 Compatible UART driven high speed serial ports
- PS/2 mouse ports
- EPP and ECP capable enhanced bi-directional parallel printer port
- 3.5" 1.44Mb Floppy drive
- Colossus 9 bay full tower case with 230W CE approved power supply and CPU cooling fan
- 105 Windows 95 keyboard and Microsoft® compatible mouse
- Powerful 70W stereo speaker system
- Microsoft Windows 95 with manuals and CD
- Lotus SmartSuite 96, Quicken v5 and SmartPics pre-loaded
- GSP Pressworks and Designworks pre-loaded
- 10 CD multimedia titles
- 1 Year warranty extendable to 3 years



Colossus P200 MMX System 97 4

£2113.83 inc.VAT £1799 +VAT

As above but with 17" screen.

Built for Windows 95

'System 97 by Colossus' truly unlocks the power, compatibility and the versatility of Windows® 95. Our full tower systems are built on a solid performance foundation that include the fastest Intel 430HX based motherboards, 4Mb 'SGRAM' graphics, massive 64Mb EDO RAM with 512k burst cache, 3.2Gb hard disk, 33.6 modem, and twelve speed multimedia with SoundBlaster 32 wavetable sound.



Telephone

01 707 25 88 99

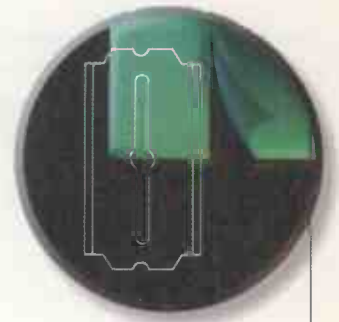
Colossus Computer Corporation Ltd. Colossus House, Travellers Lane, Welham Green, Hertfordshire, AL9 7DA

Northern Sales Office
01 282 77 00 88
Facsimile
01 707 26 74 00

Sales lines are open Monday - Friday 9.00am - 6.00pm

Business user prices shown. End user enquiries welcome

Colossus systems may be available from Colossus Authorised Dealers with different specifications, bundled software and pricing than those shown here. All prices exclude insured courier delivery and VAT (17.5%). Delivery:- Systems £25+VAT (£29.38), Lasers and large items £15+VAT (£17.63), software and small items £10+VAT (£11.75). Visa /Access/ American Express /Switch and Government orders welcome. Prices, specifications and offers are subject to change and subject to our conditions of sale copies of which are available on request. In line with industry standard practice, screen sizes are shown as the CRT size. Actual viewing area may be approx 1" less. Mail order only. No collections please. Goods are normally despatched within 10 to 14 days. All orders will be fulfilled within 28 days unless otherwise specified. Software is pre-loaded, back-up CD and manuals are available as options. Intel Inside and Pentium processor logos are trademarks of Intel Corporation. All trademarks are acknowledged. E&OE.



Books

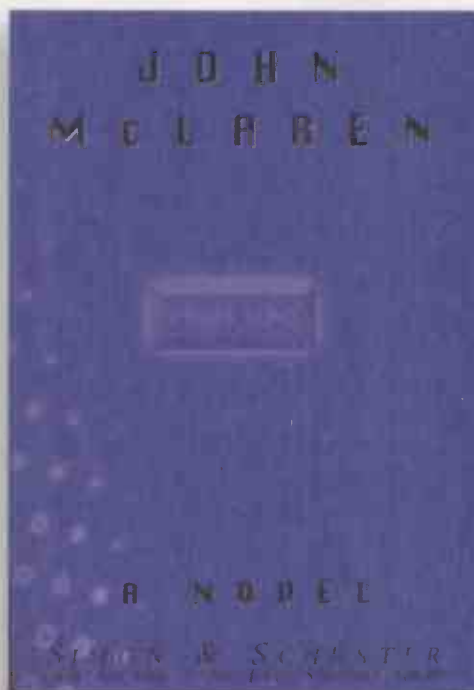
Read *Press Send*, the book, before it races on to the big screen. Plus, are crashes and bugs technology's way of telling us to resist becoming dependent on computers?

Press Send
Very few novelists manage to sell the film rights for their first novel. But John McClaren has sold his for \$750,000 to Mike Nichols, director of, among others, *The Graduate* and *Postcards from the Edge*.

What makes McClaren more unusual is his background. He puts his mediocre degree down to bad advice from Tony Blair's father, Leo, his law professor at Durham University in the early seventies. After university McClaren worked as a diplomat for eight years before being recruited by Barings, which was looking for someone to run its Japanese office. After a spell in Tokyo he moved to Silicon Valley in the mid-eighties. For the last nine years he has been a successful merchant banker and director at Deutsche Morgan Grenfell in London.

Press Send is set in Silicon Valley in the world of hi-tech start-ups and venture capital. McClaren has used his knowledge of the industry to make the technical details of the story as convincing as possible. The hero, Hilton Kask, is turned down at the last minute by a venture capital company for the money needed to develop a revolutionary genetic computer. (The description of the genetic computer — the breakthrough in artificial intelligence that everyone is still waiting for — was based on a visit to the AI centre at Edinburgh University.)

Days later, Hilton discovers he has terminal cancer, but manages to plan his revenge from beyond the grave. He leaves a mobile phone for his brother Conrad with the instruction scrawled on a scrap of paper to "Press Send".



The book has a plot that Michael Crichton would be proud of. It manages to stay just the right side of believable and it zips along. But the characterisation is weak. A review in *The Bookseller* describes *Press Send* as Douglas Coupland meets Nick Hornby; but McClaren's writing lacks the wit or knack for cultural references of Coupland or Hornby. Most of the book is written in dialogue but it's thin stuff, and the main characters are a little too stereotyped to be convincing. Nevertheless, it's an easy read and in the right hands may eventually become a great movie.

Ben Tisdall

Why Things Bite Back: New Technology and the Revenge Effect

The Revenge Effects of author Edward Tenner are the unforeseen and unintended consequences of developing new technology. As computer users we are among the most vulnerable to such effects. We all hold our breath when we boot our machines. Will the hard drive crash today? How much more paper will our supposed paperless offices spew out? Worse, will we get RSI or suffer the effects of exposure to electromagnetism emanating from the monitor? These are just some of the alleged effects of computer technology that we all know about, and in this book Tenner makes a compelling case as to why advanced technology tends to create such problems.

It's not just computers: from sport to pest control, the more complex the technology, the more pronounced the effect, according to the Princeton University professor. It's not a new problem: Thomas Edison is quoted in 1878 venting his frustration at the little faults and difficulties he encountered as he developed his technology. It just seems to be getting worse. But as Tenner states: "Bugs, glitches, and crashes have a positive side. They are the machine's way of telling us to diversify our attention, not to put all our virtual eggs in one electronic basket."

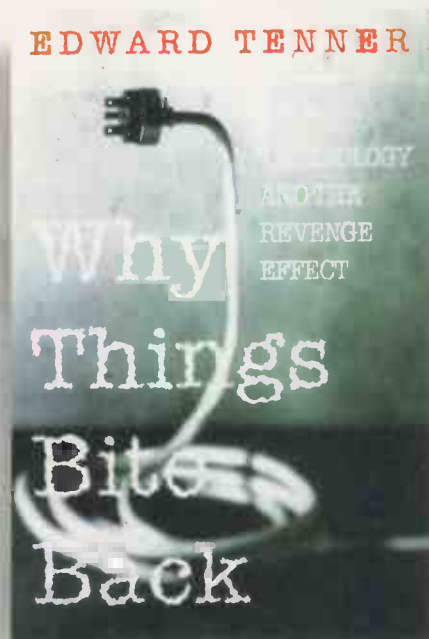
The complex systems we now build seem to have the propensity for failure, in some cases with fatal consequences: jets

p248 >

that fall out of the sky thanks to "failsafe" onboard computers being a stark example.

Tenner sees latent breakdown in all complex systems. Why has the universally applauded keyhole surgery resulted in increased re-admittance, due to related problems directly attributable to the initial procedure? Why did the M25 exceed its projected traffic loads for the year 2001, by the late eighties?

Tenner's advice is to become more vigilant. As new technology demands more concentration, it is almost inevitable that things will go wrong. Users of whatever the technology, be it a tennis racket (be careful of tennis elbow) or vacuum cleaner (watch



your asthma) must pay particular attention if they are to minimise their vulnerability. Ultimately, you may find that Tenner is too pessimistic by far, reading far too much into the paradoxes he sees. The paranoid and the neurotic are advised to give this book a wide berth.

Dave Howell

Internet Dreams: Archetypes, Myths and Metaphors

Human society relies on myths and metaphors to make sense of the world around it. Any paradigm shift in the way society is organised, or communicates, will be understood by applying these archetypes to the new order. In *Internet Dreams*, Mark Stefik looks at how we are attempting to understand the information

Top Ten Books/CD-ROMs

1	The Internet and World Wide Web: Rough Guide 2.0	Penguin	£5.00
2	Creating Killer Web Sites	Hayden	£41.50
3	Inside COM: Microsoft's Component Object Model	Microsoft Press	£32.99
4	MCSE Study Guide: Windows NT Server & Workstation 4	New Riders	£70.49
5	Microsoft Windows NT 4 Server Resource Kit	Microsoft Press	£140.99
6	Microsoft Windows 95 Resource Kit	Microsoft Press	£46.99
7	Programming Perl, 2nd Edition	O'Reilly	£29.50
8	Inside The Windows 95 Registry	O'Reilly	£24.95
9	Rapid Development: Taming Wild Software Schedules	Microsoft Press	£32.49
10	Java in a Nutshell: Desktop Quick Reference	O'Reilly	£14.95

List supplied by The PC BookShop, 11 & 21 Sicilian Avenue, London WC1A 2QH.

Tel: 0171 831 0022. Fax: 0171 831 0443

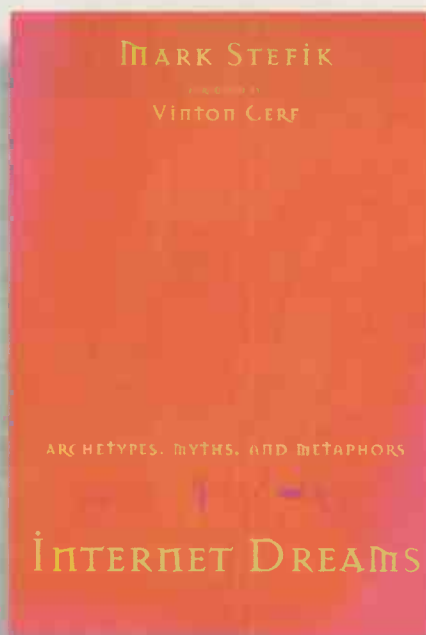
revolution, but notes that the metaphors we are using may be inappropriate and misleading. Using the highway metaphor, for instance, may be a misnomer, and completely inappropriate to the internet. As he points out: "Relying on a single metaphorical analogy would deprive us of a richer range of meaning and possibilities." The internet defies the use of one single metaphor to describe it.

Stefik concentrates on four metaphors that shape our current thinking: the digital library, electronic mail, the electronic marketplace, and digital worlds; these are all covered in depth, and he cites papers dating back 50 years in some cases to support them. He explodes what he calls the Gutenberg Myth, and applies this to the internet: as the invention of movable type didn't usher in a new age of literacy, so the internet alone will not bring about a renaissance in communication.

An interesting comparison does emerge, though. As paper for early books was expensive, not everyone could afford to own the books that would deliver literacy. Today, access to the internet is limited to those who can afford the hardware and operating costs.

For much of the book Stefik offers his views and comments on key academic papers he has identified. Each offers its own unique perspective on how we can understand and come to terms with the change we face. The last third of the book looks closely at how we can understand the net. Stefik concludes: "Our search for understanding of the I-way is ultimately a search for ourselves, and the future we choose to inhabit."

Dave Howell



PCW Contacts

Press Send

Author John McLaren
Publisher Simon & Schuster
ISBN 0-684-819198
Price £10.99

★★★

Why Things Bite Back:

New Technology and the Revenge Effect
Author Edward Tenner
Publisher 4th Estate
ISBN 1-85702-560-1
Price £18.99

★★★

Internet Dreams: Archetypes, Myths, and Metaphors

Author Mark Stefik
Publisher The MIT Press
ISBN 0-262-19373-6
Price £19.50

★★★★

THE NEW SILICA PC



HURRICANE PC

P133 SYSTEM ONLY £999 + VAT

HX MOTHERBOARD

Uses Intel Triton II HX Motherboard with 6 SIMM Sockets allowing upgrading to 512Mb of fast EDO Memory. Includes 4 PCI and 4 ISA Slots.

128bit GRAPHICS CARD

Our competitors use 32-bit or 64-bit Graphics Cards. The Hurricane includes a state-of-the-art 128-bit VGA Graphics Card with 2Mb of High Performance MDRAM.

8x & 16x CD-ROM

An 8x speed CD-ROM is fitted in the Low End Systems. A 16x speed CD-ROM is fitted in the High End Systems.

3D WAVETABLE SOUND

All Hurricane PCs come with a powerful Aztech Waverider 32-bit 3D Wavetable Soundcard.

ON-SITE WARRANTY

Hurricane PCs come with a 1 year On-site Warranty provided by Cornhill, one of the UK's largest insurance companies.

VGA MONITOR

Hurricane prices include either a 14" or 15" 28 Dot Pitch S-VGA Colour Monitor. To upgrade to any other Monitor deduct £219 (14") or £249 (15") from any of Silica's standard Monitor prices.

2.1Gb HARD DRIVE

The Hurricane uses a 2.1Gb Hard Drive from IBM, with MR Heads and an average access time of 9.5ms. It has an extremely fast rotation speed of 5,400rpm.

16Mb EDO RAM

All systems come supplied with 16Mb of FAST EDO RAM, 32Mb option available for £100 inc VAT. Expandable to 512Mb.

SPEAKERS

Systems include a pair of quality Stereo Speakers with 64watts PMPO

512K PIPELINE BURST

Most competitors use only 256K. For extra performance the Hurricane uses 512K of FAST Pipeline Burst Cache.

AUDIO HEADSET

All Hurricanes include an Audio Headset with Boom Arm Microphone and Headphone



CE Test Certified by IBM Labs

KEYBOARD & MICROSOFT MOUSE

For full compatibility, all Hurricanes come with an original Microsoft branded PS/2 mouse. In addition, we include a 105 Key Windows 95 compatible Keyboard, with a tactile feel key click.

SOFTWARE



IBM VOICE DICTATION

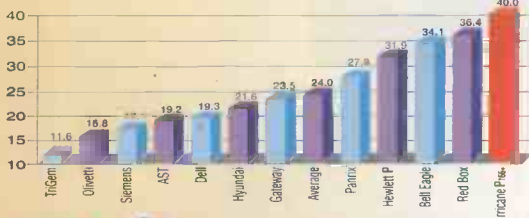
The new IBM "Simply Speaking" Voice Dictation software package is pre-loaded on Hurricane PCs. This turns your spoken words straight into text at up to 70-100 words per minute.

We are proud to offer the new Silica Hurricane PC range. As the name suggests, these machines have awesome speed and out power almost every other PC currently on the market. The price to performance ratio is stunning. You only have to look at the specifications to see for yourself.

- Powerful Cyrix or Intel Processors with 16Mb of Fast EDO RAM
- 2.1Gb IBM Hard Drive with Super Fast 9.5ms Access and 5,400rpm Spin Speed
- Latest Triton II Motherboard with Intel HX Chipset
- 128-bit STB Tseng Labs ET6000 Graphics Card including 2Mb MDRAM, Provides an Amazing Graphics Winmark of Over 40.0
- 8/16x Speed CD-ROM ● Professional Wavetable Sound Card with 3D
- Speakers - 2 x 40 watt = 80 watt PMPO



PC MAGAZINE BENCHMARKS



In the September 96 issue, Ziff Davis UK PC Magazine tested 31 different P166 class PCs. The Graphics WinMark 96 test evaluates a PC's VGA performance. The AVERAGE performance of all 31 PCs was 24.0 - With the lowest at 11.6 - The highest was 36.4. The Hurricane P166+ Graphics WinMark 96 is 40.0 giving it a HIGHER performance than any of the 31 tested PCs.

The Winstone 32 v1.0 benchmark gives the OVERALL performance for a complete PC system. The Hurricane P166+ Performance of 98.0 is 19% faster than the average of all the 31 PCs which scored Winstone 82.5. The top performer was only 9% faster but at a retail price of £3,049 (inc Vat).

	Processor Type	S-VGA Monitor	CD-ROM Speed	16Mb EDO RAM	32Mb EDO RAM
HPC 0033	AMD PR133	14" .28 Dot Pitch	8 Speed	£999 + vat - £1,165	N/A
HPC 1133	INTEL 133Mhz	14" .28 Dot Pitch	8 Speed	£1,062.98 + vat - £1,249	N/A
HPC 0151	CYRIX P150+	14" .28 Dot Pitch	16 Speed	£1,105.53 + vat - £1,299	N/A
HPC 0167	CYRIX P166+	15" .28 Dot Pitch	16 Speed	£1,190.64 + vat - £1,399	£1,499
HPC 1167	INTEL 166Mhz	15" .28 Dot Pitch	16 Speed	£1,275.75 + vat - £1,499	£1,599
HPC 1169	INTEL MMX 166Mhz	15" .28 Dot Pitch	16 Speed	£1,360.86 + vat - £1,599	£1,699
HPC 1201	INTEL 200Mhz	15" .28 Dot Pitch	16 Speed	£1,360.86 + vat - £1,599	£1,699
HPC 1240	INTEL MMX 200Mhz	15" .28 Dot Pitch	16 Speed	£1,445.96 + vat - £1,699	£1,799



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with 17 in DEBENHAMS

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BRISTOL	Debenhams	(3rd Floor), St James Barton
BUCKINGHAM	Silica	14 Market Square
CARDIFF	Silica	Frederick Street
CARDIFF	Office World	City Link Retail Park
CHELMSFORD	Debenhams	(2nd Floor), 27 High Street
CHELTENHAM	Silica	10 Pitville Street
CHESTER	Silica	116-118 Foregate Street
CROYDON	Debenhams	(2nd Floor), 11-31 North End
DURHAM	Silica	Millburngate
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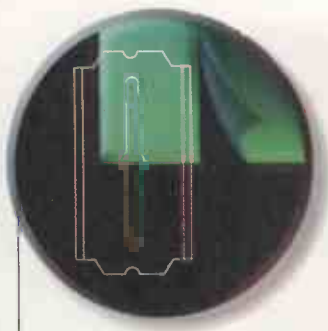
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Cryptic clues

Quantum cryptography promises total security and privacy of data on the net, even guarding against would-be eavesdroppers. Toby Howard has had his ear to the ground.

With the explosion of commerce on the net, guaranteeing the privacy of data has become a crucial issue. Today, none of the encryption methods currently in use on the internet have been proved to be watertight. They are good, and certainly extremely hard to break (so don't worry, your credit card is quite safe) but they are not unbreakable.

A new technology promises security by offering codes which are impossible to crack no matter how much computing power and ingenuity is used against them. These are codes whose unbreakability stems not from clever mathematical techniques, but from the unbending laws of physics.

When it comes to security, the internet has more holes in it than a Swiss cheese. In a study conducted at the end of 1996, computer security researcher, Dan Farmer, found that of 2,200 web sites he surveyed, almost a third had security weaknesses, rendering them vulnerable to attack.

Farmer is the author of the controversial SATAN program, which probes Unix machines on the internet and checks them for known security lapses. Not everyone likes the idea of SATAN: although originally designed for systems administrators to find unwanted open doors on their machines, and rapidly close them, SATAN is also freely available for use by malicious hackers.

Not only web sites are at risk. Email is easy to intercept by "sniffer" programs which monitor the net data passing through a system, or by unauthorised access to unencrypted email in in-box files.



Rumour has it that GCHQ (Government Communications Headquarters) regularly monitors email traffic in the UK, and that in the USA the giant supercomputers of the National Security Agency scan email for hints of terrorist or anti-government activity. Those in a position to say whether this is really going on are not telling.

Phil Zimmermann's Pretty Good Privacy (PGP) program is perhaps the best-known of the more secure coding systems available on the internet. PGP uses the RSA public-key system, which is also the basis for the secure transactions offered by Netscape Navigator and Microsoft Internet Explorer. Although public-key systems are extremely hard to break, they have not been mathematically proven to be unbreakable.

For some applications, this is not good

The codebreaker's nightmare? Quantum cryptography technology could be available by 2000, for secure data transmission on the net

enough. There is only one kind of code which is 100 percent secure, the so-called "one-time" system. The message is encrypted mathematically, using a numerical key (a

long random non-repeating sequence of digits). Using the same key, the recipient of the message can decipher it. Because a different, randomly-selected key is used for every message, the encrypted message cannot contain any inadvertent clues to help a codebreaker crack it. It is the perfect code, used by spies for decades. But there is a catch: before the message can be transmitted, the sender and the recipient need to know the key. How can the key be transmitted? By using a secure code, which needs a key... Catch 22.

Spies have traditionally solved the key distribution problem using paper pads. Each numbered page lists a series of random digits, used as the key for a message. To send the secret message, Spy A chooses a page from his pad, encodes his message

Fig 1 Code configurations

	Alice's photons	Bob's detector configuration	Bob's measurement	Bits which make up key marked *
(a)	↑	←→	random	1
(b)	→	←→	→	1*
(c)	↓	←→	random	0
(d)	↑	↑↓	↑	0*
(e)	←	↑↓	random	1
(f)	↑	↑↓	↑	0*
(g)	→	←→	→	1*
(h)	→	↑↓	random	0

with the key, appends the page number, then sends his message to Spy B who looks up the key page in his copy of the pad and decodes the message. This is secure, providing the enemy does not get its hands on a copy of the pad.

For computer networks, the first demonstrable solution to the key distribution problem uses a technique called quantum cryptography. It provides a method not only to send data securely, but also to monitor whether anyone has been eavesdropping on the communications channel. With apologies to any physicists who may be reading this, it works something like this: Light comes in packets of energy called photons, each of which has a wobble called its polarisation. There are two kinds of polarisation: up/down and left/right.

You can build a machine to read a photon's polarisation but it must be configured to read either up/down or left/right polarisations. It cannot read both kinds at once. A machine set to read up/down photons will only give a meaningful result (up or down) if the photon it is reading is the up/down kind. If it is a left/right photon, the machine will give a random, and therefore meaningless, result.

Suppose Alice wishes to send a key, secretly, to Bob. First, Alice and Bob have to agree how to use the polarisations of photons to represent bits. Let us suppose they agree on "up" = 0, "down" = 1, "left" = 0, and "right" = 1. Alice creates a stream of photons, each with a polarisation chosen at random. She records the polarisation of each. The table above (Fig 1) shows the situation where Alice has prepared eight photons, labelled (a) to (h). She then sends the photons, in order, to Bob. When he

receives each photon, he randomly configures his detector to read up/down or left/right photons. He notes the configuration, makes the reading and records the result.

In Fig 1, Bob happened to choose a left/right configuration for his detector to read photon (a), so he got a random result: in this case, a 1. For photon (b), he happened to choose left-right, which matched the type of photon and so correctly read the polarisation of the photon: a 1. For photon (c), the detector did not match the photon and so the reading was random: a zero.

When Bob has read all the photons, he tells Alice the configuration he used to read each of the photons. He can tell her this publicly, but he must keep the readings themselves secret. Alice then tells Bob which of those configurations matched the polarisations of the photons she sent him. In our example, these are (b), (d), (f) and (g). The values Bob obtained from each of the

matching configurations, taken in order, spell out the secret key: 1001. All the other readings are discarded.

If, during the exchange of photons, Eve (an eavesdropper) listens in on Alice and Bob's communications, the laws of quantum mechanics dictate that her attempts to read the photons in transit will actually change their polarisations. So Bob will receive photons in a different state from those sent by Alice. Alice and Bob will notice this and will know they have been eavesdropped. They can try again. Once the key has been securely exchanged, Alice and Bob can send their message, encrypted using a one-time method.

This example shows the principle, but in practice it is more complex, for two reasons. First, Alice and Bob will need to establish a key, thousands of bits long; and second, according to the one-time principles, their key is only good for encoding one message. They must repeat the entire procedure for every message they wish to send.

This sounds like science fiction, but it has been demonstrated in experiments by Paul Townsend, a researcher at BT's laboratories in Ipswich. Richard Hughes, of the Los Alamos National Laboratory in California, has securely exchanged keys over a 14Km optical-fibre link. There are problems to do with noise, but the method works. Hughes predicts the technology will be commercially available by 2000. We reported in Cutting Edge (Sept 1996) that computers which work on quantum mechanical principles, if built, may cause the downfall of public-key cryptography. Perhaps quantum cryptography will take its place. The codebreakers will not like it. ■

A toon in time...

Tim Frost on the growth and benefits of real-time animation techniques which will see off Saturday morning puppet TV presenters in favour of fully-animated, interactive characters.

If you have had all you can take of kids' TV programmes being co-presented by a bit of fur with a hand stuck up its rear-end uttering strangulated nasal noises, the future looks bleak. These fur monsters are going to give

way to a mix of computer animation, motion capture and electronic puppetry to put fully-animated characters on-screen, that can react and talk with presenters.

The development comes from a mix of technologies used in various parts of the

TV, film and games animation industries, where computers have done more than simply change the way in which traditional animation is produced: they have created completely new forms of animation. At the top of the scale are the photorealistic creations for *Jurassic Park*, but less obvious are big-effects movies like *Independence Day* where you cannot see the join between real action, filmed models and the computer-created elements.

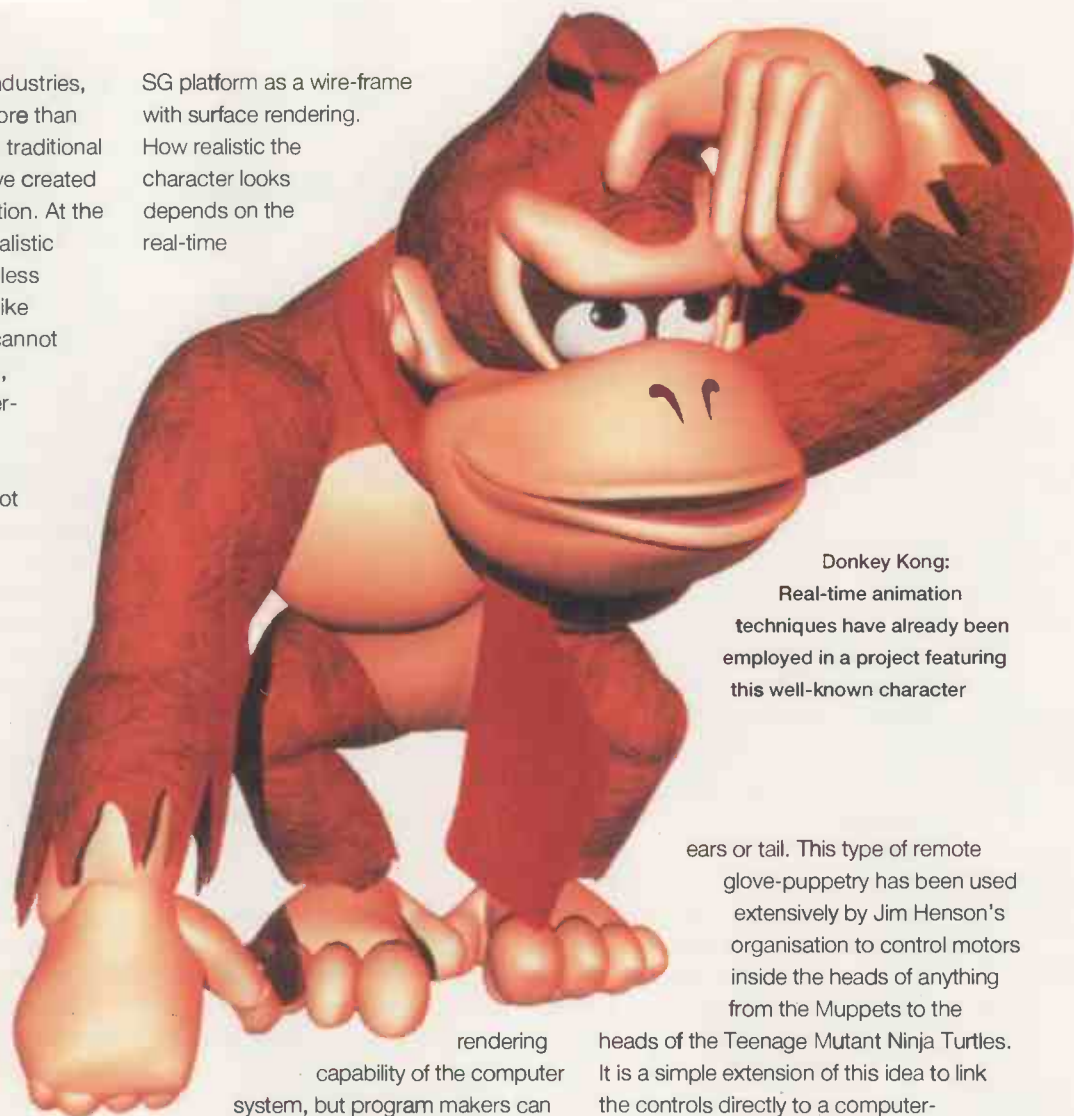
At the other end of the scale there are realistically moving, if not realistic-looking, characters. Where animated cartoon characters move in a stylised way, the animator's challenge is to impart a sense of life by characterisation, but in the games and photo-realistic animation worlds, the challenge is to get the figures to move as realistically as possible. To do this, studios have turned to motion-capture techniques, using real people's movements to define the animation's movement and add that real action feel.

Originally, for motion capture, actors dressed up in dark body suits with reflective spots and lines which outlined the legs, arms, head and body. As they went through the moves, a video camera captured the movement of the reflective skeleton which was then fed into the computer as vector movements. The simplified skeletal motion was used as an action template for the character, resulting in realistic-looking action.

There have, of course, been changes to this technique over time. Instead of computer animators taking the moving frame as a template to manually create movement, the data can be fed into the computer to directly control the virtual character. And video has given way to the use of virtual reality body-suits to directly input movement into the computer. Put this together with Silicon Graphics boxes running commercial 3D animation software and we are looking at a version of VR control to create on-screen characters that can work live, with real actors.

The slowest part of the job is first designing and creating the character on the

SG platform as a wire-frame with surface rendering. How realistic the character looks depends on the real-time



Donkey Kong: Real-time animation techniques have already been employed in a project featuring this well-known character

rendering capability of the computer system, but program makers can choose to develop their characters

as cartoony or as realistically as the computer's rendering power can deliver.

From there on, making animation is a real-time exercise with no frame-by-frame construction needed. Instead, the wire frame is directly controlled by the VR body-suit detectors that monitor the actor's individual key movements of arms, legs, head, hands and feet as well as their general body position. While the real presenters work on-screen looking to a blank space, the suitably-suited actor is working off-stage reacting to what is going on by watching their VR alter-egos on a monitor, electronically overlaid onto the studio picture.

So far so good. But a cartoon needs more than simple body movement to come to life; it needs facial expression and reactions that are not easily controlled by VR sensors. So in addition to the body actor there is at least one puppeteer with hand controllers that are set up to direct the movement of the mouth, eyes, eyebrows and any other distinguishing features like

ears or tail. This type of remote glove-puppetry has been used extensively by Jim Henson's organisation to control motors inside the heads of anything from the Muppets to the heads of the Teenage Mutant Ninja Turtles. It is a simple extension of this idea to link the controls directly to a computer-animated character.

The most immediate application for the real-time animation is as a lower-cost route to creating a new animation series. The production speed is faster than any other form of animation. All the animation for a half-hour slot could be recorded in a good day's work with live-action animators. And the actions are editable: should a facial expression not quite work, the puppeteer can simply overwrite that particular set of face actions with new ones without altering, or having to re-perform, the body actions.

Developed originally in France, real-time animation has already been used on projects featuring both Bugs Bunny and Donkey Kong. Traditionally, the developers did all the work for the TV producers, but it has now developed to the point where a TV company can buy the hardware and software and a pre-made character or two, and then get on with it themselves in their own studio with their own actors. From there on it is a matter of adding artificial intelligence. That has got to be better than none at all. ■

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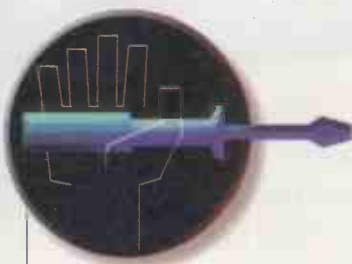
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First class letters

With VB you can use Word to create letters that virtually write themselves. Tim Anderson shows you how. Plus, how to delegate in Visual Basic to achieve the benefits of inheritance.

The "PCW Sports Club" is continually sending letters, reminders of coming events, subscription invoices, sympathy for broken bones and the like. The secretary has been running the Visual Basic application to look up the address and then using Alt-Tab to switch back and forth from Word while she copies it across. It is time to make her life a bit easier.

The first thought was to use VB's Clipboard object to copy addresses. This is easy: just add a CopyAddress method to the CPerson class, as in Listing 1.

But Windows can do better than that. It is possible to automate far more of the process of getting addresses into Word. Word has a mail-merge wizard that works fine for bulk mailings, but for *ad hoc* letters a custom solution is needed.

Here, I will show you how to create a Word letter wizard for the sports club (see screenshots, Figs 1-4). The wizard is for Word 97, since earlier versions do not support Visual Basic. (As an aside, it is possible to do something similar in earlier versions, using the WODBC.WLL Word add-in and getting at data through ODBC. Another possibility is to automate the WordBasic object from a VB application. But Word 97 makes it easier.)

The plan is to create a Word macro using Visual Basic for Applications, accessing the same SPORTS.MDB database.

Because this tutorial is based on VB 4.0, you cannot import the form in Word. The good news, though, is that the CPerson class module can be reused, as is. The procedure is as follows:

1. In Word, open the Visual Basic editor. Choose Tools, References, and check the Microsoft DAO 3.0 (or higher) object library.



Fig 1 (left) The letter wizard begins by asking which template is needed. You can easily add further options

Fig 2 (right) The next stage is to choose a name to write to

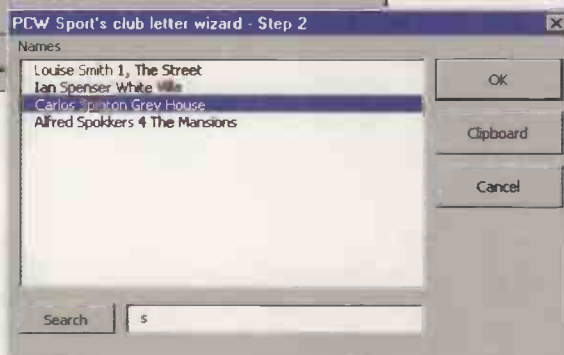
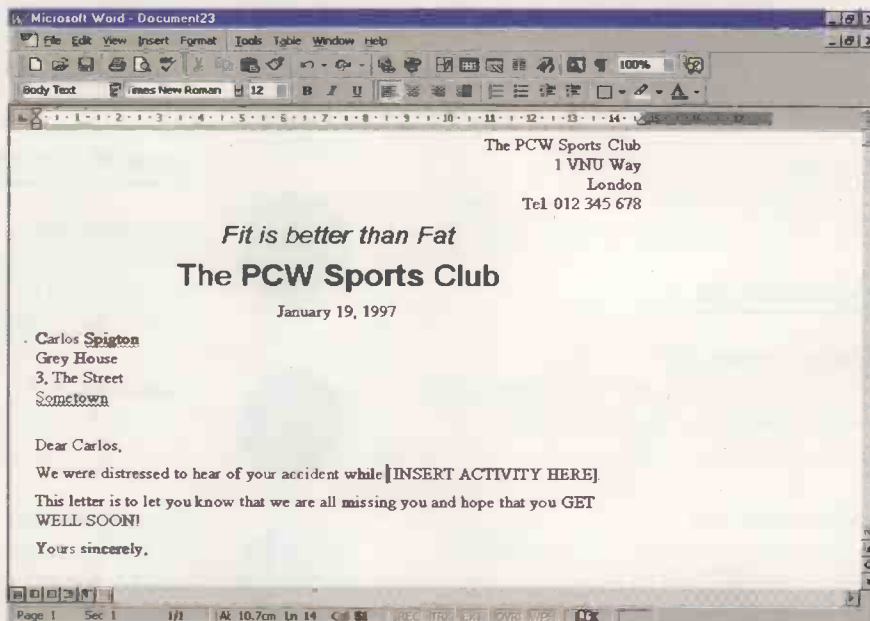


Fig 3 (below) In the third step, the wizard has placed the address details into a new document based on the chosen template



Listing 1

```

Sub CopyAddress ( )
' copies address to Windows clipboard
Dim sAddress As String
Dim cr As String * 2 ' fixed-length

cr = Chr$(13) & Chr$(10)

If mForename <> "" Then
sAddress = mForename & " " & mSurname & cr
Else
sAddress = mSurname & cr
End If

If mAddress1 <> "" Then
sAddress = sAddress & mAddress1 & cr
End If

...

Clipboard.SetText sAddress, vbCfText
End Sub

```

This enables Word to use the same data access objects as VB 4.0.

2. Insert a new module into the Normal project. This means the macro will be stored in NORMAL.DOT. Call the macro GetClubAddress and give it a Sub Main.
3. Insert two new userforms. These will be steps one and two of the letter wizard.
4. Name the first userform dlgStyle, and put two or more option buttons on it, along with OK and Cancel buttons. Give the form a

Choice property using a memory variable and property procedures. This is for choosing a letter template.

5. Name the second userform dlgName, and put on it a listbox, an editbox and three command buttons. This is for choosing a name for the letter.
6. In the Declarations section of

GetClubAddress, declare a public database object. For the example code, I have also declared some convenient constants. Then in Sub Main, open the SPORTS.MDB database using code like:

```
Set db = DAO.OpenDatabase(sPath &
"\SPORTS.MDB")
```

sPath is a variable to store the path to the database file. (See below for how to get this path from the system registry.) Sub Main also creates a new CPerson object.

The Main procedure continues by opening dlgStyle to obtain a choice of template, and then dlgName to get the ID of name in the Members database. At each point, the user has an option to cancel. The code for the dlgName dialog is almost the same as that used in the main VB 4.0 application, the main difference being that VBA has no data control so you have to create a recordset in code. When a member ID has been retrieved, the record is loaded into the CPerson object.

7. The final step is to start a new document based on the chosen template. The templates must be pre-designed with bookmarks where the name and address information is needed. The wizard finishes by inserting the fields in the bookmark positions and then exits. Controlling Word from VB in this way is not difficult using Word's new object model. For example: p258 >

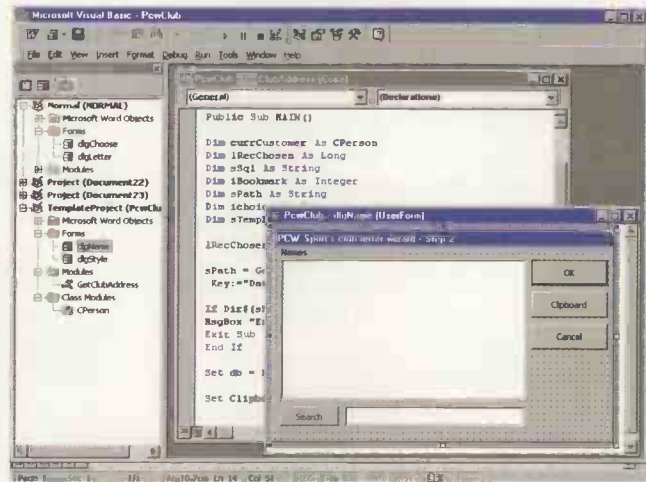


Fig 4
Editing the VBA macro from Word is very like working with standalone VB

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Delegating your inheritance

■ A common criticism of Visual Basic is that it doesn't support inheritance. If all your programming has been done in Visual Basic, which is probably true of the majority of VB programmers, this may not mean much to you. Fortunately, it's easy to explain. A class, both in VB and other object-orientated languages, defines an object. In VB, every class starts from scratch without any properties or methods. By contrast, C++, as an example, lets you begin a class definition like this:

```
class monkey : public animal
```

The result is that the monkey class inherits the properties and methods of the animal class. The monkey class just needs to add specialised code that describes monkeys; the generic animal code comes for free.

Although VB does not support inheritance, there are other ways of achieving some of the benefits. It is possible to contain one class within another. Then you can implement properties and methods of the parent class by calling the properties and methods of the contained class. This is called delegation, and the properties and methods of a class are called its interface. For example, the tutorial application has a CPerson class. Imagine you wanted to create a CEmployee class which used the properties and methods of CPerson. Here is how you can do it:

1. Insert a new class module and set its name property to CEmployee.

2. In the declarations section, put:

```
Private m_person As CPerson
```

```
Private m_wage As Currency
```

3. In the initialise section put:

```
Set m_person = New CPerson
```

4. Create a CEmployee interface that calls the CPerson interface. For example:

```
Public Property Get surname() As
String
surname = m_person.surname
End Property
```

5. Add new properties and methods specific to CEmployee. For instance, you must expose the wage property.

The fourth step (above) is tedious, but beats re-coding all the functionality of CEmployee in CPerson. It could be automated by a VB Wizard. In Visual Basic 5.0 this approach to object-orientation is built into the language, with a new Implements keyword which guarantees that all the methods of the contained class are implemented by the outer class. You can implement the interface of any ActiveX automation server. Finally, there is nothing to stop you implementing several interfaces in a single class.

Delegation works, but it is neither as intuitive nor as elegant as traditional inheritance. For the moment, though, this is the VB way. It ties in with ActiveX, the component model which is becoming more powerful and pervasive as Windows evolves. VB may not be the fastest or most thoroughly object-orientated language out there, but Microsoft does ensure that it stays up to date with the latest ActiveX developments.

```
Documents.Add (sTemplate) ' starts
a new document based on the given
template
```

```
ActiveDocument.Bookmarks("name").
Select ' sets cursor to the "name"
bookmark in the new document
```

```
Selection.InsertAfter Trim
(currCustomer.firstname & " "
& currCustomer.surname) ' inserts
text at the cursor position
```

Problem-solving

There are a few things to notice about this joint Visual Basic and Word project. Although Word VBA is downward compatible with VB 4.0, there are some objects which are available in VB but not VBA. One example is the global App object which, in Word, is the Application object.

The original CPerson class used App.Path to discover the location of SPORTS.MDB. This strategy fails in any case, when the code runs in other applications. A better idea is to use a registry entry, using VB's GetSetting

command. The registry entry is created by the main VB 4.0 application when it first runs. This way, the data can easily be found by any Windows application.

Another catch is that VBA has no Clipboard object, so CPerson's CopyAddress method does not compile in Word. The workaround is to declare a public Clipboard variable as a DataObject: VBA's private version of the clipboard. To demonstrate, there is a Clipboard button on the dlgNames form which uses the DataObject's PutInClipboard method to transfer text to the read clipboard.

Enhancing the wizard

There are plenty of ways you can improve on the Letter Wizard. For instance, you can add database fields for things like job title and salutation. You could increase the range of templates on offer. For the subscription template, you could write code to check a person's outstanding balance and insert the amount into the letter. By adding the bulk of the code to a shared class module like CPerson, you can easily reuse it in VB 4.0 or in other VBA applications such as Excel.

Installing the example code from the PCW CD

When you unpack the tutorial code from our cover-mounted CD, you will find a VB 4.0 project and a Word 97 template. To install the example code, copy PCWCLUB.DOT into your Word templates directory. Then start a new document based on this template. If you then choose Tools, Macro, Visual Basic Editor, you will find the example macros. Choose Tools, Macro, Run, to run the macro. You can also copy the macros into NORMAL.DOT if you want, by using Tools, Templates and Add-ins, Organizer. Finally, the macro will not run without a registry setting for the data path. To create this setting, run PCWCLUB.EXE.

■ Next month: Back to native Visual Basic for the final stage in the PCW Sports Club application.

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Tim Anderson welcomes your comments and queries. Write to the usual PCW address, or email pcw@vnu.co.uk

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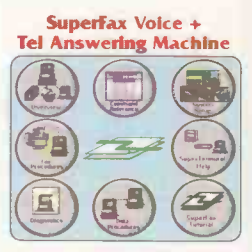
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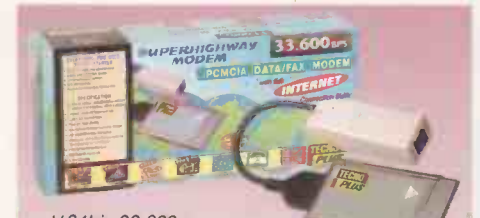
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Cycling to work

Tim Nott explains the technique known as colour cycling, which you can use to “animate” your startup screen. And the History folder: web skeletons in your cupboard... revealed.

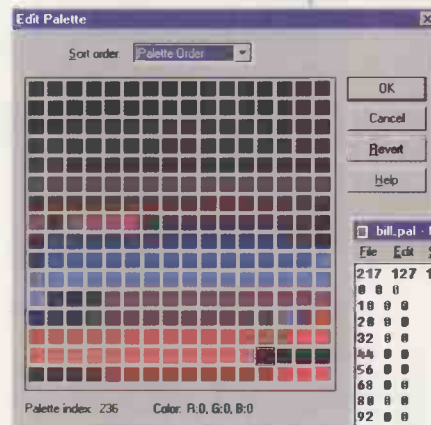
We've dealt before with changing the Windows start-up screen, but just to recap, the trick is to create a 256-colour .BMP file, 320 (w) x 400 pixels (h), and save it as “LOGO.SYS” in the root directory of the disk from which you boot (normally C:\). This doesn't change anything permanently; if you delete it, the default screen, embedded somewhere in the innards of Windows, will return. But what has hitherto eluded us, is how to achieve the animation: those jolly blue flashing bars at the bottom of the screen that keep us amused while Windows is loading. Now, thanks to the efforts of Jason Ozin, who wins a book or record token for his pains, all can be told.

What you see isn't, strictly speaking, animation. It's a technique known as colour cycling. In a 256-colour bitmap, also known as an “indexed” image, each pixel is stored as a one-byte number that refers to a place in a palette of 256 colours. The palette, stored in the same file, is optimised for the image: a clouds-and-sky scene would have lots of shades of blue and white; an autumn-trees scene lots of shades of red and brown. This, incidentally, is why you sometimes see bizarre colour changes when viewing multiple images on a 256-colour display: the altered image is being displayed in the palette of another image.

Each colour in the palette is stored in three bits corresponding to 256 values each of red, blue and green. Colour cycling scrolls some or all of the values in the palette, so each pixel cycles through the range available. If the graduations are subtle, this gives the illusion of a flowing “plasma” effect, as seen in the Chromazone screensaver (*Hands On Win3.1, Sept 1996*).

To create a cycling image you'll need a

bitmap editor. You can use something like Corel Photopaint or Adobe Photoshop if you want to be posh, but I used Paintshop Pro (Fig 2); there was a trial version on February's CD-ROM. It has the advantage



of being cheaper, easier to use and (a killer feature in this case) being able to import or export a palette as a plain text file.

You can use Windows Paint, but you won't have much control over what's animated as you won't be able to edit the palette. You'll need a hex editor and a sturdy anorak. For the former, I used Hexedit (Fig 1); it's old but simple to use and there's a copy on our CD-ROM in Hedit.ZIP.

Catch your bitmap (preferably in 16 million colours) and resize or crop it to 640 x 400. Although the final image will be half as wide, it's actually stretched to this size when displayed, so you'll be working in WYSIWYG mode. Do everything you want (like adding anti-aliased text that won't

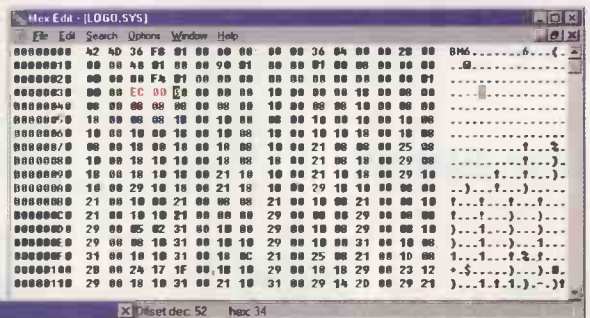
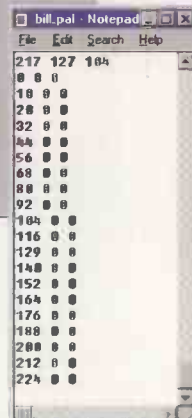


Fig 1 (above) Enabling animation with a hex editor

Fig 2 (left) Editing the palette in Paintshop...

Fig 3 (below) ...but it's easier to export it to Notepad



show the “staircase” effect) while in this mode. Reduce the colours to 236. In Paintshop, you can do this by going to Colours/Decrease Colour Depth/X Colours. Select Nearest Colour and deselect Include Windows Colours. This will leave 20 spare colours for your animation.

If you then go to Colours/Edit Palette you should see that the last 20 colours are all black and have values of 0,0,0. Double-click on one of these and you'll be able to edit it, either by dragging the sliders or entering red, green and blue values in the boxes. This is the tedious bit, as you must make sure that none of the new colours have already been used. There is an easier way: save the palette, from the Colours menu, and you'll find you can load this file into Notepad (Fig 3); you'll see a three-line header, followed by a line for each of the 256 colours in the form (for example, 256 0 0 is bright red). The last 20 should all be 0 0 0. I wanted some shades

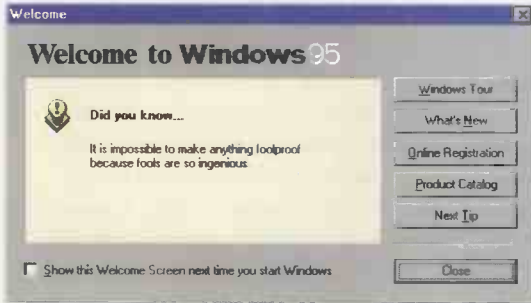


Fig 4 Thank you, Peter McGarvey

developed strange properties:

1. "Double-clicking the desktop icon reveals nothing: 0 objects, 0 bytes.
2. "DOS says there are 313 files in c:\recycled.
3. "Choosing File, Empty Recycle Bin elicits 'Are you sure you want to delete these 1041 items?'
4. "With the Recycle Bin window open, a newly deleted item will appear in the Bin, but not after it's closed and re-opened. The number of files in 2 and 3 above are both increased by 1."

The most likely causes are that one or both of two hidden files in c:\recycled has been damaged, or that someone has moved files to C:\recycled using File Manager or DOS. Although the Bin

of red going to black, so I edited these to read 0 0 0, 10 0 0, 20 0 0 going up in steps to 228 0 0. Make sure none of the colours are already in the file. If it's a photo this will be unlikely, but if so, skip around them with a slightly different value. Save the file and with the original image open in Paintshop, load the altered palette. Using only the 20 new colours, create the bits you want to animate (double-click on the foreground and background swatches to choose).

I wanted to create a shaded circle effect but you can't use shaded fills in 256-colour mode. The workaround is to create a new file in 16 million colours, create the shaded fill using the same start and finish colours (by double-clicking the swatches and typing in the RGB values), then use the elliptical selection tool to copy and paste into the original file. When you're happy with everything, resize the image to 320 x 400 (Image/Resize), making sure that Maintain Aspect Ratio is unticked. Save the file as a .BMP (Windows RGB encoded).

Copy the file to C:\ and rename it to LOGO.SYS. Load it into the hex editor and go to byte 00000032. Change the value to EC (the hex equivalent of 236) which will mark the start of the cycling part of the palette. Change the following byte to 00 or 01: the former cycles through the colours and jumps back to the beginning, the latter cycles up and back down again, smoothly.

Save, exit and restart the computer: your new animated start-up screen should greet you. To give you some idea of what can be done, I've included two I made earlier on our CD-ROM (in Logos.ZIP). Bill.sys uses the red shaded circle effect mentioned earlier, as well as some static text that changes colour. Psyched.sys is a slightly doctored screen grab from Chromazone; in this case the cycling starts at hex 85. Copy either to C:\ and rename it LOGO.SYS.

Loony Bin

Following the exposé of the Recycle Bin (November 1996), Matthew Connor wrote to tell me that his Bin had recently

Sod's law

It's tip of the day time again. For those of you who haven't been following the saga, the communal goal is to create a set of suitably amusing replacements for the Windows "Tips of the Day".

Stephen Oman offered a generous selection including "Programming is an art form that fights back". Dave Ives came up with three including the oldie-but-goodie: "It doesn't matter who you vote for, the government always gets in". But star of the month is Peter McGarvey, whose example graces our screenshot (Fig 4, above).

His covering letter was even better: "Once upon a time I wrote a program, in C, to display a short piece of amusement, at random, from a large text file of amusements every time my computer started. This program was written for MS-DOS, the greatest operating system in the universe. All my friends saw this program and asked for a copy.

"However, the next greatest operating system in the universe, Windows 3, soon appeared. I wrote a program, in C++, to display a short piece of amusement at random from a large text file of amusements every time Windows started. All my friends saw this program and asked for a copy.

"However, the next greatest operating system in the universe, Windows 95, soon appeared. Alas, the program written in C++ started to misbehave and all my friends started to complain. To placate them I hacked the Windows registry using a subset (180 out of 2,000+) of the large text file of amusements to rewrite the built-in 'Microsoft Tips of the Day'.

"The next greatest operating system in the universe, Windows NT 4.0, has just appeared. However, all my friends, and Bill Gates, can sod off."

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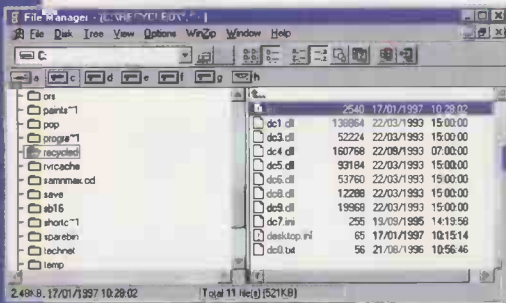
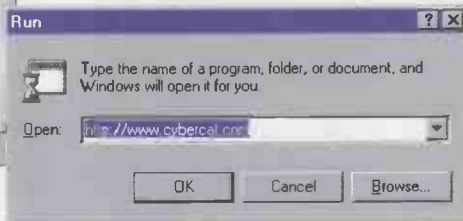


Fig 5 (left) What's in the bin? File Manager gives a drive-by-drive view

Fig 6 (below) Connect to a web site from the "Run" command



appears as a single entity, you get a Recycled folder on each hard drive or partition (Fig 5).

If you look at C:\recycled in File Manager (Run `winfile.exe` with View/All Files ticked and View/By File Type... everything ticked) you'll see a number of files named Dcn.* where "c" is the drive letter, "n" is a number and "*" the extension of the original file.

There should be two other files with the "hidden" flag set (i.e. an "h" in the right-hand column) named "Info" and "Desktop.ini". (There may also be Dcn.* files with the "h" attribute set, but this isn't important.) The Info file maps the Dcn numbers to the original file name. If it's damaged, nothing may show in the bin. Try deleting it. According to Microsoft it should be recreated when you start Windows, although this didn't work for me.

Alternatively, it may mean one or more of the recycled files themselves are damaged. If this is the case, Microsoft recommends you create a copy of the Recycled\Desktop.ini file in another folder, then delete the entire contents of the Recycled folder. Next, restore the Desktop.ini file to the Recycled folder and repeat the process for each drive or partition.

Note that doing this permanently deletes all files in the Recycle Bin.

Grovel

■ Stephan Freeman asks, re February's Hands On: "Does audio data really take up 10Mb/sec? So a one-minute long recording is 600Mb, and 72 minutes is 43.2Gb? Sorry, I had to point it out — I couldn't resist it." Thank you, Stephan. That should, of course, have been 10Mb/minute.

■ Concerning my comparison of Poledit with a well-known all-British motor vehicle, Jack Dobson complained: "Having just spent £9,000 on a new Reliant Robin, I am less than pleased at your sneering remarks. For me, it spoils an otherwise good article." Sorry, Jack. I'll add the Reliant Robin to my list of politically incorrect subjects for humour.

History lesson

Those of you using Internet Explorer 3 will have noticed that Windows maintains a History folder, listing the URLs of recently-visited sites. This is in addition to the Temporary Internet Files folder that caches the web pages and graphics themselves. Like the Recycle Bin, Fonts and others, these are special folders: if you open them in File Manager, you'll again see a file called Desktop.ini. You'll notice, too, that things are not as they seem: under DOS or File Manager, the Temporary folder contains four sub-directories and the History folder contains, apart from Desktop.ini, just two files; MM256.DAT and MM2048.DAT. The former makes sense as it's more efficient to store and retrieve lots of small files in this way, rather than all in one directory. The latter makes sense as it saves disk space: if several hundred links were stored as individual files, each would take a "cluster" of hard disk space (on a 1Gb partition, that's 16Kb each).

Dig into the View/Options of Internet Explorer and you'll find you can empty both these folders. Or can you? Having cleared the History folder, you'll still find the two DAT files in File Manager. Load these into a text editor and you'll discover details of all the URLs and searches you thought you'd deleted. I'm not sure whether this is a gross breach of personal privacy or a heaven-sent tool for supervisors to crack down on unauthorised web browsing. But I think we should have been told.

Quick tips and clever tricks

■ Following January's tip for shutting down the computer without the confirmation dialog, Nick Mortimer and Tariq Atchia wanted to know if this shortcut could be modified to restart Windows. I have to confess that I haven't been able to find out, although it would seem likely. However, there is a quick way to log on as a different user. Press the Window key + L. If you

haven't got a Windows 95 enhanced keyboard, then you can use the Key Remap utility in Kernel Toys (on February's CD-ROM) to make the right-hand Ctrl and Alt keys behave as if they were the Window and Menu keys. Thank you, Ed Scrase.

■ Martin Short wrote: "In Win3.1 programs running under Win95, the drive letter heads the directory tree in Save As... This can be frustrating if I want to save some work on the desktop. Is there a way to modernise these trees?" In a word, no. Windows 3.1 applications use the old, common Open/Save dialog which maps folders directly to the DOS directory structure. This can't cope with the peculiarities of Win95, such as having C:\Windows\Desktop as a container for other drives.

■ Kev Baldry asks: "When opening Explorer, drive C: is always shown expanded. If I wish to browse, say, my CD-ROM on D: I have to scroll up drive C's listing until I can contract it. Is there a way to display all the drives just as their icons and not expanded when starting Explorer?" Yes, there is. Open the Start Menu folder, find the Explorer shortcut and right-click on it. Select Properties, go to the Shortcut tab and change the Target to read

```
C:\WINDOWS\EXPLORER.EXE /n,/e,/select,C:\
```

■ Steve Luby writes: "When 32-bit programs lock up in Win95, I usually press Ctrl-Alt-Del which brings up the Close Program dialog box. Instead of proceeding to press the End Task button to terminate the program, just wait three or four seconds and press Cancel. For some reason this seems to purge the affected memory area and in a couple of seconds you are returned to your application, complete with all the data input up to the moment of lockup. I have tried this with several applications (most often with Word 95) and it seems to work very well most of the time." Word 95 locking up, Steve? Surely not! I've yet to try this, but it sounds like it's worth a go.

■ A quickie, from Peter Smith — I thought we'd had this before, but it seems not: "I have just realised that with Internet Explorer installed you can connect to web sites via the Run command on the Start menu. This led me also to find that you can put internet shortcuts onto the start menu as well."

PCW Contact

Email Tim Nott at Win95@pcw.vnu.co.uk



The mousetrap

Yes, it's a good old-fashioned whodunnit: when your mouse trips up while treading the, er, mat, you can help it get its act together. Panicos Georgiades and Gabriel Jacobs direct.

With standardisation on Microsoft-compatible mice, mouse problems have lessened but haven't disappeared. Mice can still fail to function at all, be too fast, too slow, move in certain directions and not others, and work in some programs but not others.

Mouse matters come in threes. There are three types of mouse: Microsoft, Microsoft-compatible, and Microsoft non-compatible; three different ways of connecting them: via the bus, a PS/2-style socket, and a serial port; and they can be used in three types of application:

1. DOS applications, in which case they usually require a driver loaded in the config.sys or autoexec.bat files.
2. Windows applications, in which case the driver is provided by Windows, or a Windows driver is provided by the mouse manufacturer.
3. DOS applications running within Windows.

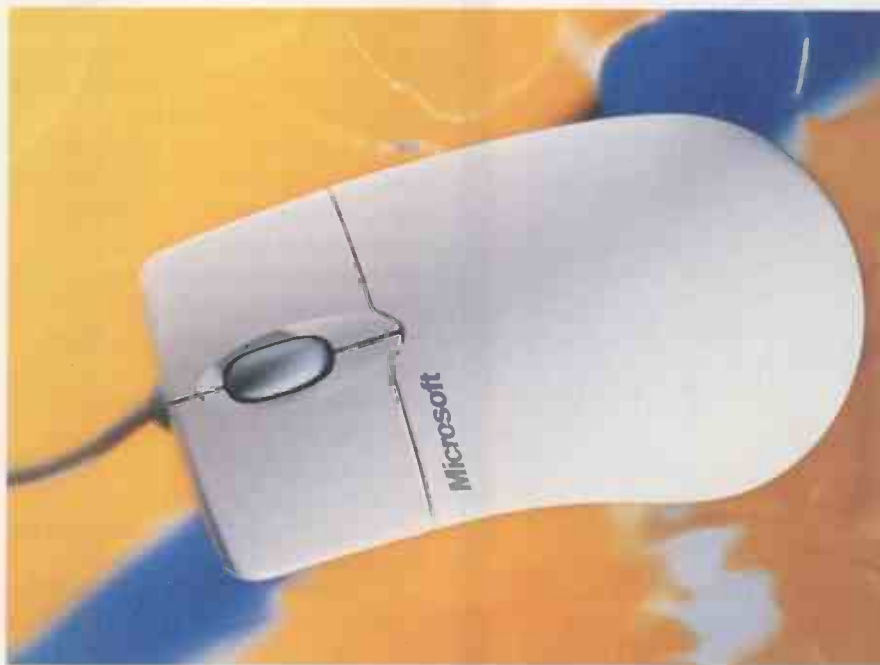
And, yes, there are three different

Adjusting mouse settings

- Lowering the Sensitivity value in the Mouse section of Control Panel makes the mouse movements less jumpy.
- If the mouse is jumpy in Program Manager group windows, lower the granularity settings in the Desktop icon of Control Panel.
- If you're using the DOS-based mouse driver mouse.com or mouse.sys version 7.04 or later, add the /Y switch to the end of the mouse command line

```
(c:\windows\mouse.com /y)
```

- Note that erratic mouse movements may be specific to the application, video card, machine BIOS, keyboard BIOS, or machine type you're using.



When problems strike, are you a man or a mouse? Take valuable advice on failsafe fix-its

causes of mouse problems:

1. Hardware: the mouse isn't plugged in properly, it's a bad or unclean mouse, there's a bad mouse socket, a bad cable, a slippery or uneven mouse mat, or the mouse is connected to the wrong port or with a wrong or bad adaptor.
2. Bad drivers: an older or incompatible version is being used.
3. Conflicting software: your mouse driver may not agree with Windows, or a particular program, or with some other program running at the same time like a TSR program, anti-virus software, or screensaver.

A classic situation is using too many drivers. Manufacturers provide drivers for Windows and DOS (and sometimes for particular DOS programs) and nowadays for Windows 95. Don't install them all —

Windows may not run properly if DOS mouse drivers are also there.

So, if you have a mouse behaving badly, first check for hardware causes — plug it into another computer, or plug another mouse into your computer. Next, establish that the mouse works in DOS and in Windows separately. If the mouse doesn't work in a DOS application under DOS, it will not work in that application if you run it under Windows. Install the DOS drivers needed in the autoexec.bat and/or config.sys files, as described in the mouse's documentation, and ensure that all works fine under DOS.

If you have a Microsoft mouse, use version 8.2 of the driver which comes with Windows 3.1 and, if necessary, expand mouse.sy_ and mouse.co_ (they're on the

p264 >

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Windows disks) to your hard disk as mouse.sys and mouse.com by using the EXPAND command at the DOS prompt. You can test whether all works well using a DOS program which supports mouse movements such as Edit. Then disable the DOS drivers by placing the word REM in front of the lines referring to them in the config.sys and autoexec.bat files, and check the mouse works under Windows.

The Windows mouse drivers are set using Windows Setup, and they appear in the system.ini file in the [Boot] section.

Normally there should be a line like

```
mouse.drv=mouse.drv
```

To check you have installed the right Windows driver, exit Windows, change directory at the DOS prompt to c:\windows, and type SETUP. If you get a message saying no mouse has been detected, select the Microsoft or IBM PS/2 option.

Note that some so-called Microsoft-compatible mice are more compatible than others, and you might have to use some trial and error. In particular, try the drivers which come with the mouse installation disk rather than the Microsoft drivers. If all the above fails, try the following suggestions.

- Search the drive for multiple mouse.drv files. If you find any, rename them to something else, except for the one in the Windows System sub-directory.
- Test the mouse on a different port.
- Check that there's only one mouse.ini file, and that the line `MouseType =` in the [Mouse] section of the file points to the correct port.
- Try running Windows in standard mode. If all works well, try loading Windows by typing win /d:x. If all is still okay, add the following line to the [386Enh] section of system.ini:

```
EmmExclude=A000 - EFFF
```

- Finally, if you're using a mouse that came with its own drivers, try to borrow a mouse that uses the driver supplied with Windows. If that works, contact the manufacturer of your own mouse.

Out of Africa

"I am doing voluntary work in Nigeria, and have been working on a stock-control and tracking program using DOS 6.22 and QBasic (the v4.5 compiler), but the compiled version of the program gives a totally incorrect output at the printer — the numbers are all wrong. Inspecting the code doesn't reveal much, as the only difference

lies in an LPRINT statement (to printer) and a PRINT statement (to screen). There is no problem with interpreted printed reports or displayed reports. I've tried two different printers — no difference. I enclose some output samples. My big fear is a virus, as they are rampant here."

Leigh Bowden, Nigeria

The Microsoft Knowledge Base doesn't list your problem, but there are a number of possible causes.

We doubt a virus is the culprit — virus programmers tend not to target something as old as QBasic! We assume that you're not trying to print while running the program in a DOS session within Windows, as this doesn't work with all DOS programs.

The output samples you sent us show that the text prints fine; only the numbers are wrong. This obviously implies that the problem lies in calculations or statements to do with numeric data only — perhaps a different set of calculations is being used to output to the screen than to the printer. Programmers sometimes attach calculation statements to PRINT statements, and since QBasic needs two different statements, one for the screen and one for the printer, the set for the printer may contain errors.

Alternatively, it may be that certain formatting commands used for the printed output don't work properly when compiled. In any case, check you're using the right version of the compiler for the version of QBasic you have, and that you're setting the right options for handling numbers for the compilation. Also, have you checked the compiler documentation for supported statements and commands? Some statements are supported by the interpreter but not by the compiler.

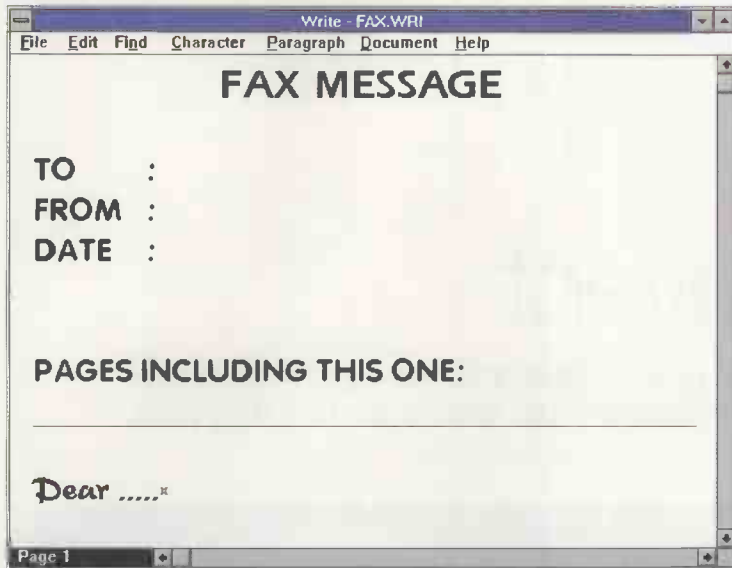
The write font

A frustrated Bill Reid (<mailto:reidw@nacn.dnet.co.uk>) mailed us about being unable to change the default font in Windows Write. Each time you start Write, the default font is Arial: he wants it to be Times New Roman.

Trying to answer this query has prompted us to write about a method of creating templates for Windows Write, to use for letters, memos, and faxes, a feature available on all mainstream word processors but missing from Windows Write.

You can create your own designs and save them as standard Write documents. Give them names like letter.wri, memo.wri

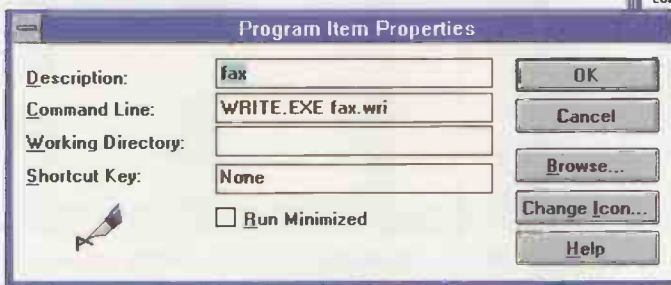
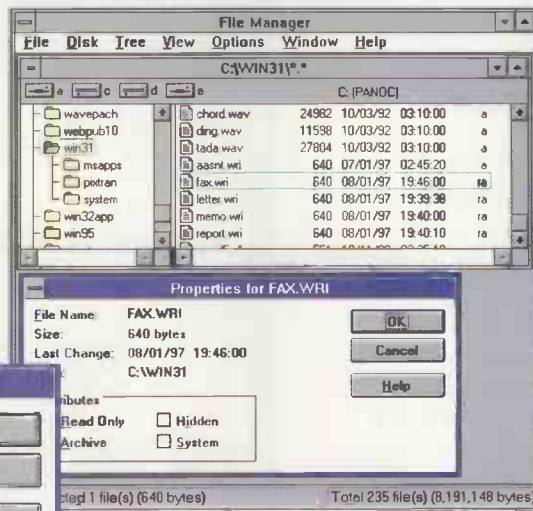
A step-by-step guide to creating Write templates



Above Create your templates in Write and save them as any ordinary Write documents

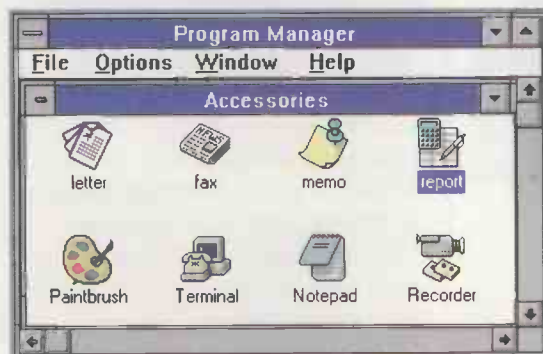
Right From File Manager make the template files Read only

Below Create multiple copies of the Write icon and edit each one to include the template file name in the command line



Right You will end up with multiple Write icons, each one starting a different template

Below To customise your templates even more, choose a different icon for each one using the icons embedded in Progman.exe, or any other icons you may have



and fax.wri. To prevent overwriting the templates, you have to Save As, not Save, and to avoid using Save by mistake, make your template files Read Only by changing their Attributes in the Properties option of the File menu in File Manager.

To use the templates you open Write, then use File Open to select a template, or you can assign icons to each template so you can open them with a double click. To do this, start Write and the template in one go by editing Write's Properties in the File menu of Program Manager. In the command line of the Properties dialog box add the filename of your template, so the command line reads, for example, write.exe letter.wri.

Do this for all your templates by clicking and dragging the Write icon while pressing

the CTRL key to make copies of it, then editing each one's command line to include a different template filename. Change the default Write icon to another one by using icons embedded in Progman.exe.

To change the default font

from Arial to something else, create an "empty" template. The only problem is that the template can't be completely empty, so

you need to type a space, say, then select that space with the mouse, and from the Fonts menu change the font to the one you want.

PCW Contacts

If you have any queries or Win3.1-related topics to discuss, contact Panicos Georghiadis and Gabriel Jacobs at Win3@pcw.vnu.co.uk.



The main event

The Windows NT event logs keep track of what's happening in the system, but they themselves need regular attention. Dale Strickland-Clark shows you how they work.

When you want to know what's been happening on your system, the NT event log is the place to turn. It's the central record for notable incidents and can help with problem diagnosis, resource management and capacity planning.

Each NT workstation or server has three event logs: system, security and application. The system log contains information about configuration problems, the state of the services and the use of printers. Application programmers determine what they consider important enough for the application log and administrators control most of what is written to the security log.

These logs are a valuable source of information concerning what has happened on a system and it's a good idea to archive them daily if you're ever likely to want to examine the historical behaviour of a system.

Records are written to the event log in a format which, in part, is only understood by the application that wrote them. When you view or export the logs, the system calls upon each application to format its own records so you can make sense of them. This is great until you take a raw event log

Once the event log data has been massaged into a tidy comma-delimited format, Excel will quickly turn it into a simple database

Date	Source	Type	Category	EventId	User	Computer	Description	X1	X2	X3	X4	X5
97/01/21 14:06	Print	Information	None	10	NeilW	MAMMOTI Document	NEILW	Mars	20411		0	
97/01/21 14:02	Print	Information	None	10	AmandaH	MAMMOTI Document	AmandaH	Jupiter	2072218		1	
97/01/21 13:59	Print	Information	None	10	NeilW	MAMMOTI Document	NEILW	Mars	18471		0	
97/01/21 13:52	Print	Information	None	10	AmandaH	MAMMOTI Document	AmandaH	Jupiter	1765950		1	
97/01/21 13:44	Print	Information	None	10	NeilW	MAMMOTI Document	NEILW	Mars	26930		0	
97/01/21 13:41	Print	Information	None	10	NeilW	MAMMOTI Document	NEILW	Mars	24126		0	
97/01/21 13:36	Print	Information	None	10	PeterC	MAMMOTI Document	peterc	Pluto	23436		1	
97/01/21 13:36	Print	Information	None	10	NeilW	MAMMOTI Document	NEILW	Mars	20423		0	
97/01/21 13:36	Print	Information	None	10	PeterC	MAMMOTI Document	peterc	Pluto	23436		1	
97/01/21 13:33	Print	Information	None	10	AmandaH	MAMMOTI Document	AmandaH	Pluto	9190		1	

TYPE	DATE	TIME	SOURCE	CATEGORY	EVENT	USER
Sunday 17						
Error		5				
	97/01/19	10:49:25	RemoteAccess	NONE	20065	N/A
	97/01/19	10:49:49	RemoteAccess	NONE	20065	N/A
	97/01/19	10:42:15	RemoteAccess	NONE	20065	N/A
	97/01/19	10:34:16	Service Control Manager	NONE	7011	N/A
	97/01/19	09:49:54	RemoteAccess	NONE	20016	N/A
Information		9				
	97/01/19	10:40:47	Wins	NONE	4007	N/A
	97/01/19	10:40:38	Ohcp Server	NONE	1024	N/A
	97/01/19	10:40:22	SNMP	NONE	1001	N/A
	97/01/19	10:30:51	BROWSER	NONE	8016	N/A
	97/01/19	10:30:48	BROWSER	NONE	8015	N/A
	97/01/19	10:38:24	EventLog	NONE	8005	N/A
	97/01/19	10:38:31	Serial	NONE	3	N/A
	97/01/19	10:34:15	BROWSER	NONE	8033	N/A

The Crystal Reports bundled in the Server Resource Kit provides exception reporting and basic analysis of event logs

(an .EVT file) and attempt to examine it on another system. If the application that created the records isn't installed, you may find that much information won't make sense. Depending on the network, you may

also find that user IDs are displayed in their internal representation, which is a curious string of digits called a SID. There is a similar danger when attempting to examine an old archived log. If applications have been removed from the system or users deleted, some log entries may reveal less than you'd like.

For these reasons, it's a good idea to consider the information you're likely to want to extract from event logs before choosing your storage strategy. It's also worth watching the size of the event logs you generate. Large logs of tens or even hundreds of megabytes per day on a busy system are easily achievable if you're over-zealous with auditing.

Because of the possibility of event logs

becoming useless over time or losing touch with the applications creating them, long-term storage and most types of analysis are going to depend on a formatted export of the event log. I think there are three main types of uses to which the event log is put. The first is as a problem alert, although it's not really designed for this: serious problems are already written to the console and sent as messages to registered administrators. Second is as a problem diagnosis aid for when something isn't working properly and you need to find the reason. Lastly, as an audit trail, to record who's done what.

As part of a capacity planning exercise, I needed to find out which printers on a network were being most heavily used and by whom. The Event Viewer application that

comes with NT is adequate for viewing raw events but pretty hopeless for analysis. While it will export the logs in a comma-delimited format, you can't automate the process and the resultant file might be described as offering an interesting challenge for analysis.

There is a tool in the NT 4 Resource Kit called DUMPEL that might have helped simplify getting the data out of the logs, but in spite of the help file suggesting otherwise, I couldn't get a comma-delimited file out of it. I'll look at this again when I come to automate the archiving of log records, but for now I was happy to get the data out by hand, using Event Viewer.

The Server version of the Resource Kit includes a copy of Crystal Reports that will read the event logs directly and produce a

The screenshot shows a Microsoft Excel window titled 'Print analysis.xls'. A PivotTable is displayed, summarizing data from a source table. The PivotTable has 'Data' as the source and is filtered by 'Print' value of 10. The columns are 'Pages sent', 'Jobs sent', and 'Bytes sent'. The rows list various printers: Jupiter, Mars, Mercury, Pluto, and Venus, along with a 'Grand Total' row.

	Pages sent	Jobs sent	Bytes sent
Jupiter	1245	375	544252183
Mars	6083	5396	202941236
Mercury	6960	3211	249634615
Pluto	3136	1645	236803596
Venus	1801	830	46128973
Grand Total	19245	11457	1279560603

Excel's PivotTable is an ideal tool for interactive analysis. Here it summarises the use of several printers

Books

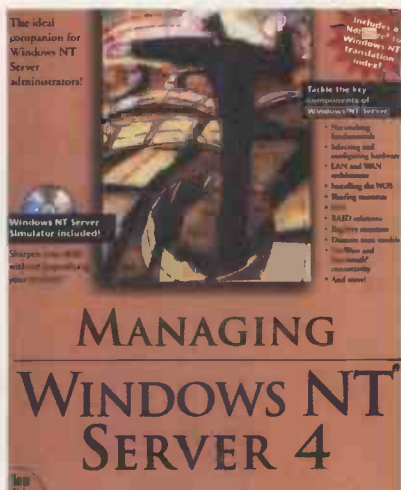
■ Managing Windows NT Server 4

Author: Howard F. Hilliker

Publisher: New Riders

Price: £46.99 (incl VAT)

This book bears a striking resemblance to *Inside Windows NT Server 4* (reviewed January 1997) by the same publisher. Many of the subjects covered are similar, and I'm also suspicious of the number "4" in the title. Parts of the text have a distinct NT 3.51 ring to them and there are even screenshots from an NT 3.51 system. Worse, the console command reference at the back of the book mentions none of the extensions introduced in NT 4. Either this is a revised 3.51 book, or it's been a long time in the making. Gripes apart, this is a solid, thorough volume covering most of the issues concerning NT administrators. The CD is a corker, with a vast amount of demonstration NT software plus a free copy of *Inside Windows NT Server* in Acrobat format.



■ Whiz Bang Web Site F/X

Author: Tom Lockwood

Publisher: Que

Price: £32.99 (incl VAT)

This book solves one of the great mysteries of the web age: how do you make a background that tiles seamlessly? Also explained is using image maps, creating animated GIFs, working with audio, Java and multimedia. CGI scripts and VRML are explored along the way on the journey to producing appealing web sites.

The book adopts the unconventional approach of listing very few of the code samples on its pages, leaving you, instead, to fish them off the CD — which is nicely organised as a web site with links to relevant pages out in the real world.

The author knows his subject well and explains it clearly. This is an ideal companion for someone already familiar with HTML but who wants to be more adventurous.

■ Microsoft Exchange Connectivity Guide

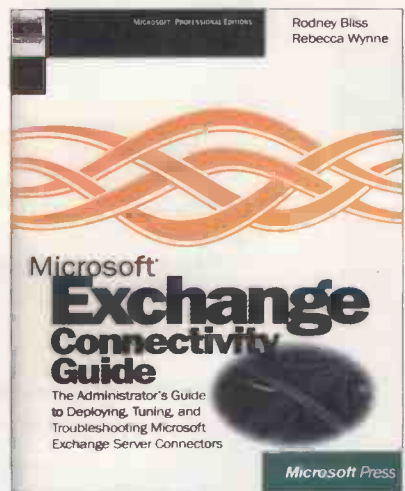
Authors: Rodney Bliss, Rebecca Wynne

Publisher: Microsoft Press

Price: £27.49 (incl VAT)

The connection possibilities offered by Exchange are many and even the experienced administrator can find themselves with a system that really should be transmitting mail but stubbornly refuses. This book explains the large number of parameters that affect message transfer and fills the very large holes left by the documentation supplied with the software. It assumes little and explains setting up a server to talk to the internet, X400 or MS Mail in networks of varying complexity. All the dialog boxes concerned are shown and each parameter is explained along with possible problems you may encounter and what to do about them.

A very comprehensive and useful reference.

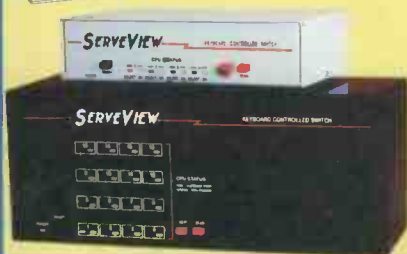


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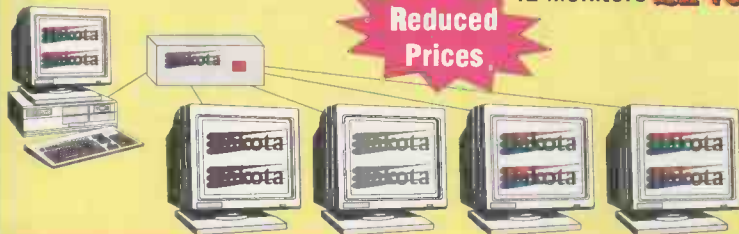
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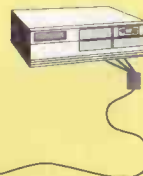
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 - Manual Printer Switch £19**
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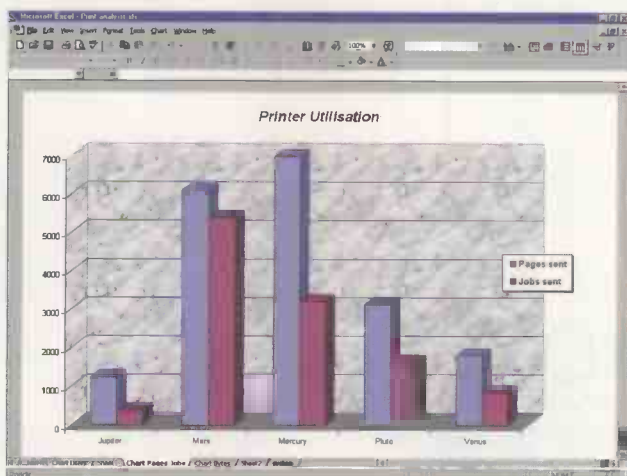
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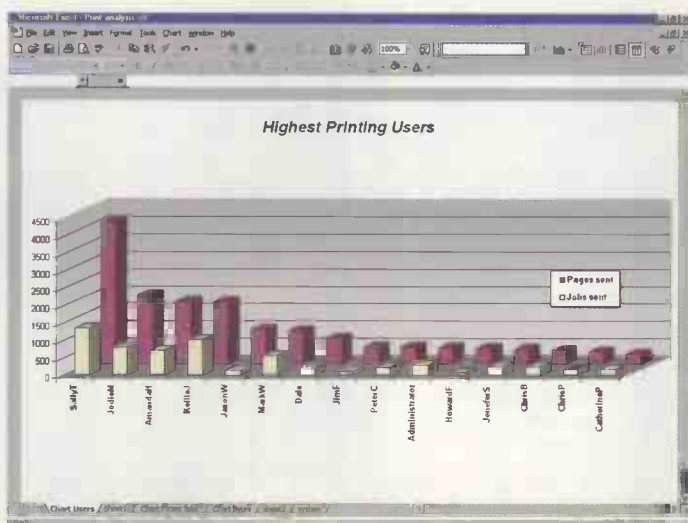


Left The poor distribution of workload is now evident. Mercury, an overworked LaserJet 5P, might benefit from swapping places with Venus, a rather swift Lexmark Optra Rt+ Below Highlighting high print users might encourage economic printing behaviour. Sadly, it's turned into an ugly scramble for the top position

variety of reports, but in the end I chose Excel to do the analysis backed by a little Perl program to sanitise the data.

I exported the system log from the server into what the Event Viewer program calls a comma-delimited format and ran it through the Perl program, cleanevent.perl

(see screenshots, page 266). Cleanevent adds a header record, identifying the columns so Excel will treat the data as a database. It merges the date and time fields from the log, it picks up all the trailing description fields that sometimes follow a



record and adds them to the end of the original record, and, finally, it identifies the records relating to printing. From these it picks out the user ID, printer name and print size, placing them in the general-purpose fields, X1 to X4, on the end of the record. If the output of cleanevent is written to a .csv file and dropped into Excel, it will automatically be split into individual cells and is immediately ready for analysis.

I called upon a PivotTable (under the Data menu) to do the analysis and finished off with a few charts to help illustrate the load on the printers.

The Perl routine could easily be extended to extract other interesting information, split the logs into smaller record sets or write it to a database for long-term analysis.

PCW Contacts

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Mouse moment

If you cast your mind back to the January issue, you may recall my request that Santa deliver a new design of pointing device. Well, it wasn't Santa but Microsoft that came up with the goods, and while it's not exactly what I asked for, we're definitely heading in the right direction. I refer, of course, to Microsoft's new Intellimouse. I've only been using it a month or so and already I'm lost at a PC without one. Now, with an ordinary mouse, I find myself scraping uselessly at the little gap between the two buttons and receiving strange looks from uninitiated onlookers. Scrolling has never been so effortless. Nine out of ten points, Microsoft. I'll save the extra one for when someone comes up with a cordless version. (Are you listening, Logitech?)

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The **common** good

... and bad, unfortunately. But Chris Bidmead is in combative mood as he attempts to install the Common Desktop Environment on his network, and defends a remark he made earlier.

A couple of months ago I mentioned that CDE, the Common Desktop Environment, is now available for Linux, and I showed you a screenshot of it running on LinuxPro, the version of RedHat Linux supplied by WGS (Workgroup Solutions) whose web page (unsurprisingly) is www.wgs.com.

I'd borrowed the screenshot from the WGS web site. But this is supposed to be the Hands On section, so I made a vow to myself that I'd follow through by getting hold of the software and installing it on my network. There's some bad news about this, some good news, some more bad news, but ultimately, I'm glad to say, some good news.

Before we get into that, I'd like to deal with some heated email from a reader who objected to my remark in the column that the CDE screenshot made LinuxPro look "uncannily like the AIX desktop — which of course is the point of CDE". When the major UNIX manufacturers got together in 1993 around an initiative called COSE (the Common Open Software Environment), of which CDE was to be the first component, the intention was to simplify things for system administrators and users by offering a "look and feel" that would be similar across all the UNIX platforms. One of the first manufacturers to implement this was IBM on AIX, and as I happen to run AIX here, it seemed worth mentioning the resemblance.

Andrew Lehane seemed to think I was suggesting IBM had invented CDE singlehandedly. If my very brief mention in the screenshot caption gave that impression, I'm sorry. Long-term readers of this column may remember that back in January 1994, speaking of IBM's

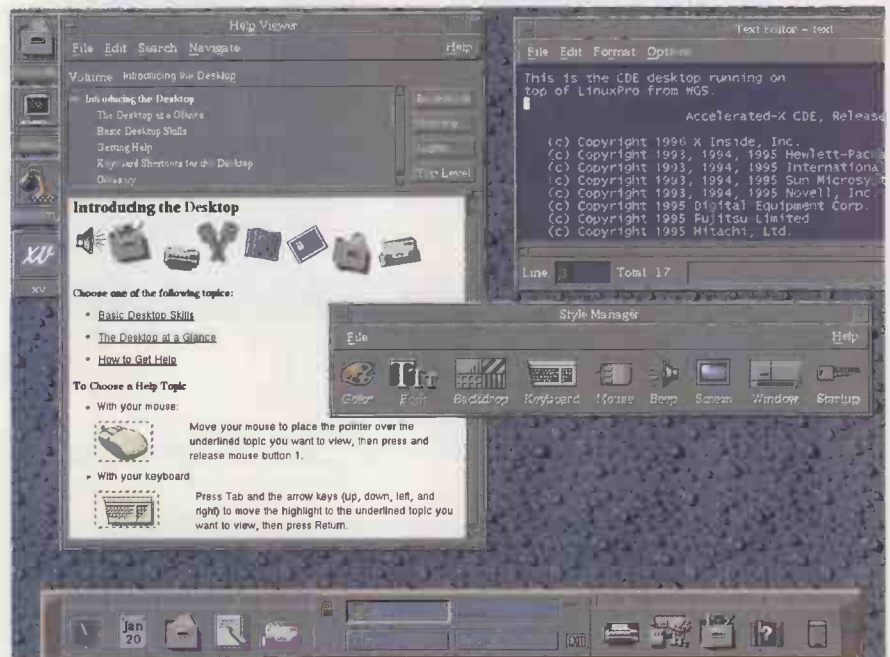


Fig 1 This is the Common Desktop Environment. It happens to be running on top of LinuxPro, but in theory it could be any UNIX and you wouldn't know the difference. It's not just a pretty face — there are internal subtleties like drag-and-drop which I'll investigate in later columns

introduction of the LaunchPad on OS/2, I said: "And the first of the promised COSE interface features also arrives with version 2.2 — a dashboard control based on Hewlett-Packard's VUE (Visual User Environment), a point-and-click program launcher and screen manager."

Yes, the panel at the bottom of **Fig 1** derives heavily from VUE, but Andrew's complaint ("Why make these statements when, as I am sure you realise, CDE is in fact a decedent of HP's VUE Windowing System, an enhancement to OSF/Motif developed in post-Apollo days and released prior to 1991 for HP-UX 8.0?") seems to suggest that this is the whole story. In fact, all the COSE members

pooled their technologies to create CDE, as you can see from the copyright notice in the picture. As COSE was an initiative rather than an organisation in its own right — or as Sun's CEO, Scott McNealy, famously put it, "COSE is a verb and not a noun" — the product needed to be nurtured through the existing alliance of UNIX manufacturers, the Open Software Foundation (OSF) which has since been rolled into The Open Group. Andrew's loyalty to Hewlett-Packard (it turns out that he's working in its Telecom Systems Division) is commendable, and I'm delighted that he reads and likes the column, but I hope I've managed to deflect his accusation of "inaccuracy".

Good and bad

Now for that good news/bad news stuff. As soon as I discovered there was a Linux version of CDE, I dropped an email to Mark Bolzern, the Linux guru who runs WGS. The first lot of bad news was that he was very nervous about sending me review software because, as it turns out, it costs him an arm and a leg in royalty payments each time he ships the product. I find it ironic that someone whose core business is distributing royalty-free software should be held to ransom by the so-called Open Software Foundation, which charges him \$100 for the CDE and Motif components in each CDE shipment.

It's a tribute to Mark that he managed to get a package out to me, comprising the six-CD set that makes up LinuxPro, along with the CD and manuals for CDE. This was the good news. The implementation of CDE he uses comes from an outfit called Accelerated X, mainly known for its souped-up commercial version of the X server for UNIX on PCs. Its CDE requires the Accelerated X server, which is what Mark ships with his LinuxPro.

I installed LinuxPro and was all ready to go on to the CDE when the shattering news came through about Apple's acquisition of NeXT. I dropped everything and spent the next week or so on the internet, news gathering and chatting with gurus by email for some articles I was writing. After the dust had settled and it became clear that Gilbert Amelio may turn out to be the best thing that ever happened to Apple and NeXT (although it's a rocky road ahead) I finally caught my breath and went back to the relative tranquillity of LinuxPro and CDE. Or rather, just LinuxPro. Because — the next bit of bad news — I simply couldn't get my system to read the CDE CD.

I'd installed LinuxPro on the old Apricot Xen LS-II. You may remember the trouble I had with SCO OpenServer not being able to recognise the Xen's Sony CDU31a CD-ROM drive because it uses a proprietary non-SCSI, non-IDE interface. There's no problem with Linux though — a driver for the CDU31a is part of the standard distribution. One of the Linux system developers, Mark Evans, has even written a driver for the rather obscure on-board busmastering ethernet port on the Xen.

The Apricot Xen LS-II had read the LinuxPro installation CDs perfectly, and as far as I can remember had never shown any sign of trouble with other CDs before. But

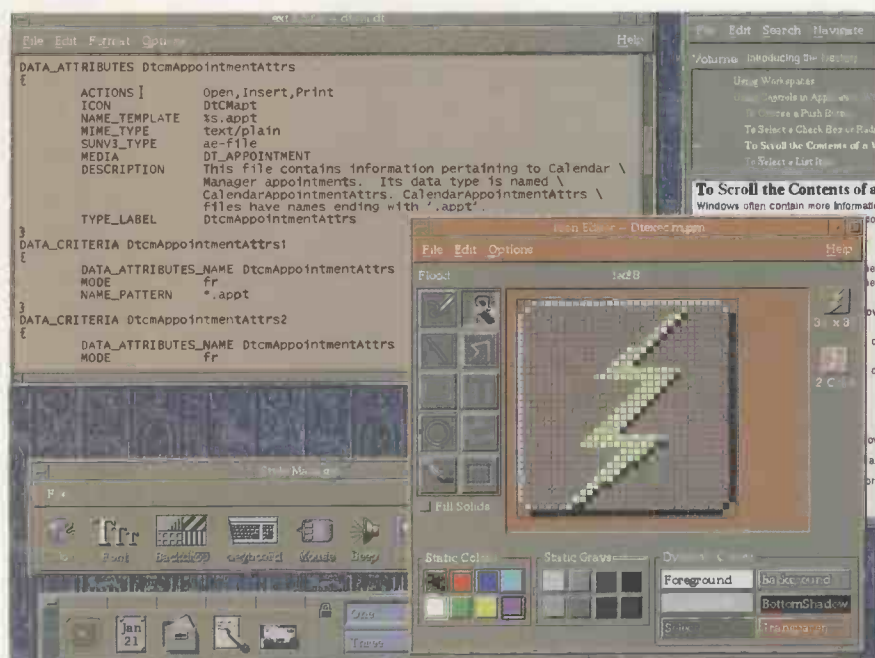
with this particular CD it was spinning its wheels, just at a time when I was desperate to install CDE and get a screenshot to you. Attempting to mount the CDE disk produced the error message (after a long hang) "can't read superblock". Even before I tried mounting the drive, its flickering LED indicated that it was labouring during the spin-up following inserting the CD. Oddly, the NeXT machine and the AIX PowerPC had no difficulty reading the CDE CD. It was just this combination of the Apricot drive and the CDE CD that was coming unstuck. After some experimentation — and I'm not going to tell you how many hours I spent messing around with this — I was forced to the conclusion that some drives, particularly older drives, just don't like some CDs.

This was distinctly bad news, and I found myself wondering how long it would be before I could free up another machine, reinstall LinuxPro on it, and then proceed with CDE. I was about to pack away the Apricot and sit down to write my excuses to you when I suddenly realised that this was the old, narrow, standalone-PC mentality that I'd supposedly escaped from three years ago when I started this column. The AIX machine, which had no trouble reading the CDE CD, is networked to the Apricot. Thanks to NFS, the Network File System that comes with every UNIX under the sun (or Sun, I should perhaps say), it's a trivial matter to hook up the AIX CD-ROM

drive straight into the Apricot and treat it as though it were a local drive. NFS is a client-server connection. Here, the AIX box is the server and needs to expressly "export" the drive in question. How you do this varies somewhat depending on the version of NFS. Under AIX, I used Smit, IBM's System Management Interface Tool, to mount the CDE CD in the drive and then export the drive — or rather, the directory I'd mounted it on — over the network. The directory doesn't actually go anywhere at this stage; it just gets added to a list of directories that the NFS daemon advertises as being available for network connection.

On the Apricot I then needed to mount the exported directory onto a local, empty directory. I created a /mnt/NFS directory and mounted the AIX CD-ROM there. If you read the manual pages for mount (you need to do this with the command "man 8 mount", 8 being the manual chapter that deals with system admin) you may come away reeling from the surfeit of options available. But the Linux mount command is pretty smart these days: if you just ask it to mount aixbox:/mnt/cdrom /mnt/NFS (mount this alien filesystem on this local directory), it should be able to figure out for itself that you're talking about an NFS mount and that it needs to be read-only because you're dealing with a CD-ROM.

Having done this, I had the full contents of my CDE CD available from the Apricot's



The CDE desktop reconfigured with a different background and colour scheme. Here you can see the icon editor together with a sample of the code CDE used to tie icons to executables and ascribe particular behaviours to them

/mnt/NFS drive. I switched to this directory, ran the dtinstall script I found there, and CDE loaded itself on top of my LinuxPro, with the handsome results you see in Fig 1.

Networking, modules and more

LinuxPro is based on the RedHat distribution, with some refinements added by WGS. Traditionally, Linux installation kernels come loaded with drivers for a huge number of devices and rely on autoprobing software to find out which ones to activate. This can leave you with an overlarge kernel, which is sometimes a tight fit where memory is limited. Once the installation is finished, you're normally recommended to recompile a slimmed-down version of the kernel tailored to your specific machine. For beginners, I should point out that this turns out to be a lot simpler than it sounds.

My Apricot Xen LS-II has 16Mb of RAM, which is plenty of room for Linux.

Nevertheless, I prefer to start with the smallest possible kernel and add features as and when I need them. In the early days of Linux you couldn't do this, but newer Linuxes let you load "modules" which can be drivers for physical devices, file systems, or translation code like the iBCS module that lets you run applications written for other versions of UNIX. Mark Evans has modularised the driver for the Apricot Xen's on-board i82596 ethernet controller, so I installed a kernel that had no networking enabled, made sure this was working, and added the networking later. If you haven't yet installed Linux I should point out that most Linux distribution CDs come with a large variety of pre-compiled kernels in the form of disk images. You choose the appropriate image, transfer it to a floppy (where it appears as a bootable kernel and a bunch of vital support files) and use that as the initial boot disk. During the installation process you get the opportunity to install that same boot kernel onto your hard drive.

Typically, the installation process will mollycoddle you through procedures like setting up the network. The upside of this is that you get a working system with the minimum of effort. The downside is that you don't get to understand the fundamentals. Because I was starting without a network driver, the rest of the networking naturally refused to configure itself. Doing this manually was instructive and, luckily, not too arduous.

I found myself telling reader Michael Butler <m.butler@ic.ac.uk> about this at some length, and what follows below is a

Fig 2 Results of ifconfig

```
eth0      Link encap:10Mbps Ethernet  HWaddr 00:00:49:20:26:2F
          inet addr:192.168.1.25  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1176 errors:0 dropped:0 overruns:0
          TX packets:555 errors:0 dropped:0 overruns:0
```

Fig 3 Kernel routing table

Destination	Gateway	Genmask	Flags	MSS	Window	Use
Iface						
192.168.1.0	*	255.255.255.0	U	1436	0	569
eth0						
loopback	*	255.0.0.0	U	1936	0	48 lo

Fig 4 Resorting to ping

```
PING 192.168.1.3 (192.168.1.3): 56 data bytes
64 bytes from 192.168.1.3: icmp_seq=0 ttl=255 time=1.7 ms
64 bytes from 192.168.1.3: icmp_seq=1 ttl=255 time=1.4 ms
64 bytes from 192.168.1.3: icmp_seq=2 ttl=255 time=1.4 ms
64 bytes from 192.168.1.3: icmp_seq=3 ttl=255 time=1.3 ms
64 bytes from 192.168.1.3: icmp_seq=4 ttl=255 time=1.5 ms
64 bytes from 192.168.1.3: icmp_seq=5 ttl=255 time=1.5 ms
```

condensed version of that correspondence. Michael had written to me about the trouble he was having with his network card, and he'd opened his mailing with: "I have been converted to Linux through reading your column in PCW. It's a great column and worth the cost of the magazine alone!". This is a great way of getting my attention.

Once the install of the minimal kernel is complete, I login as root and then check that there's a set of modules, including the apricot.o module, somewhere among the library files. In my present version of Linux this turns up under /lib/modules/1.2.13/net.

Linux comes with a number of tools for handling modules, and you can get the full list with the command apropos modules. Among these is the insmod (insert module) command. This knows where to find the modules, and knows that modules are .o files, so the command line to add my network driver is just

```
insmod apricot
```

We've now installed the ethernet driver for the device known as eth0, but it's not yet doing anything very useful. You connect it to the network in two stages: first we need to give our eth0 a TCP/IP address, known as the "dotted quad" address. We use the ifconfig networking utility to set this up:

```
ifconfig eth0 192.168.1.25
```

With my own small network setup this

means I've given this particular machine the identifying number 25 on a network whose name is 192.168.1.0. (The full story is much more complicated, but let's not worry about that now.) The next step is to tell eth0 where to find the network. For this we need the route utility. Again there are all sorts of complexities you can get into with route, as you'll see if you consult man route, but for now let's just go with

```
route add 192.168.1.0 eth0
```

And that's basically it. If you now run ifconfig and route without command line parameters you'll get a report on the state of play. ifconfig gives something like Fig 2 (there'll also be an entry for lo, the loopback interface). The output from route should look like Fig 3. To check that the network really is connected I can use the old standby, ping, to send test packets to another machine and have them echoed back at me. For this I need the dotted quad address of the second machine

```
ping 192.168.1.3
```

which should give something like Fig 4, confirming the network is now working fine.

PCW Contact

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Citrix fruit

Terence Green finds a novel solution to running Win32 apps on OS/2, explaining how Citrix WinFrame turns NT into a multi-user applications server. Plus, Warp 5 and the Domino effect.

Several readers have enquired about running Win32 applications designed for Windows 95 and NT. The fact is that for Win32 applications, you have to run Windows NT or Windows 95.

There are some exceptions, but if you absolutely must run Office 97 or Office 95, you have no choice. However, it is not all gloom because there are some alternative paths. Applications written to Win32s up to version 1.25 will run on Warp. If you do a little digging around you may even find that some supposedly Windows 95 applications are actually Win32s. And remember that you only have to run Windows NT or Windows 95 if you cannot find a suitable OS/2 application.

All the news seems to be about Windows, but this doesn't mean that OS/2 applications don't exist. It's only that they're not likely to be reviewed or written about in the popular press. Blame IBM's past folly for that. At least now, if you've upgraded to Warp 4 and seen the Application Sampler, you know there are loads of OS/2 applications out there. You'd be amazed at what you can find by searching the internet.

Another course of action is to select applications that do not mandate Windows: Lotus SmartSuite 97, for example. SmartSuite runs on Windows and Warp, which gives you more flexibility — especially if you are supporting a mix of users. The Windows version is shipping in the United States as I write and an OS/2 version will soon be ready. Non-US versions will take a little longer and OS/2 versions a while longer still, but the Warp version of SmartSuite 97 should pitch up by about mid-1997.

Just add Citrix

A more novel solution for running Win32 applications on OS/2 is Citrix WinFrame 1.6 or later. WinFrame turns Windows NT into a multi-user Windows applications server and supports clients running a variety of operating systems including OS/2 version 2.11 or better (Fig 1).

Win32 applications run on the Windows NT WinFrame server and OS/2 clients view the display in a Warp Win-OS/2 session. Wyse and Insignia offer similar solutions for Windows clients using technology licensed from Citrix (www.citrix.com) but only Citrix WinFrame ports OS/2 clients.

Citrix WinFrame is a specialised solution

that won't suit everyone and isn't cheap, but it's very much in tune with the idea of OS/2 as a networked client in a network computing environment.

For the right applications and processes, the WinFrame model enables large companies to manage multi-platform networks more easily and to have more choice over the client hardware. Instead of equipping everyone with fast Pentiums with multi-gigabyte drives and 32Mb RAM, you can make better use of older hardware by serving up remote applications.

The WinFrame model is pretty similar to network computing with Java except that it delivers existing Win32 applications while

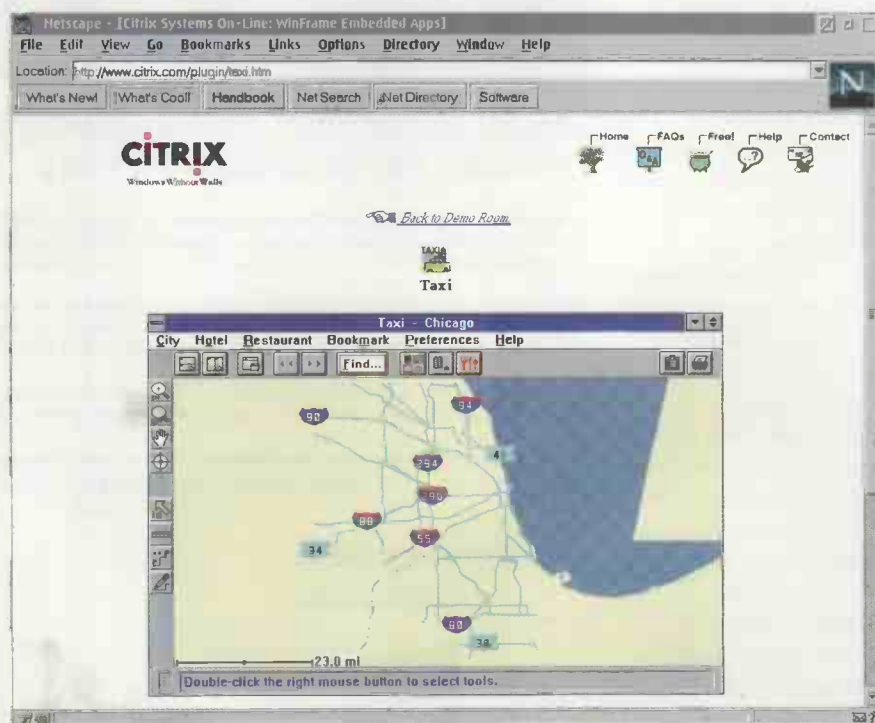


Fig 1 With the Citrix WinFrame Plug-In for Netscape, it is even possible to work over the internet with Windows applications that are running on a remote server

Points of support

■ OS/2 Central on CompuServe

GO:OS2CENTRAL has been started to provide discussion and support for all areas of OS/2 Warp. One of the founder companies, Creative Systems, produces the CompuServe OS/2 offline reader, Golden CommPass, and has acquired rights to the CompuServe Information Manager for OS/2 (OS/2-CIM).

■ Drivers

- Epson Germany is developing drivers for several printers in Epson's Stylus range. The drivers aren't free. Send mail to novasta@ibm.net for details.
- If you have a WinTV card take a look at the WarpTV page at www.wdi.co.uk/os2tv/download.htm for the driver situation.

we're waiting for Java to get real. Of course, when there are Java applications, they will be just one more ingredient which can be added to the mix available to network computing clients alongside WinFrame.

Warp 5.0

Java is coming along nicely. Java 1.02 is now GA (or generally available — IBM's way of saying "shrinkwrap") along with the Java 1.02 Just in Time (JIT) 2.0 compiler for Warp 4. Java 1.02 for Warp 3 and for Warp Server is pencilled in for this summer and Java 1.1 for OS/2 should be ready by the autumn.

Shrinkwrap, as a physical entity, is set to shrink as software companies begin to explore alternative software delivery methods. With network computing in mind, software is bound to reduce in size and more packages will become available electronically. In particular, IBM and Lotus are experimenting with software delivery via the internet and one of the plans is to offer Warp upgrades online (as hinted at by me in my previous column).

IBM will deliver well over a dozen different updates to Warp 4 this year. The sum of the updates, which includes SMP support, TCP/IP 5.0 and Java 1.1,

will take Warp 4 to its next major version. Warp 5 is pencilled in for a 1998 release, about 18 months after Warp 4 shipped.

Users can choose which updates to receive. An OS/2 user in a traditional network might concentrate on the client/server enhancements to NetWare, Windows and Unix connectivity. By contrast, a network computing OS/2 user might be more interested in the TCP/IP, Java and network security modules.

With effect from next month the service will be chargeable, available to any Warp 4 user with a modem and internet access. It is like buying Warp 5 on an instalment plan.

Warp updates

All the discussion of how few applications there are for Warp, and how much choice there is in the world of Windows, can make for depressing reading, but more often than not this ignores the fact that Warp is often the first platform to have real leading-edge capabilities. Put another way, Flash now seems more popular but Jif was the first.

I was reminded of the way in which OS/2's advanced capabilities often go unsung when I read the header of some email I received from a former *PCW* columnist, now working for a rival publisher.

In the header of his message I noticed

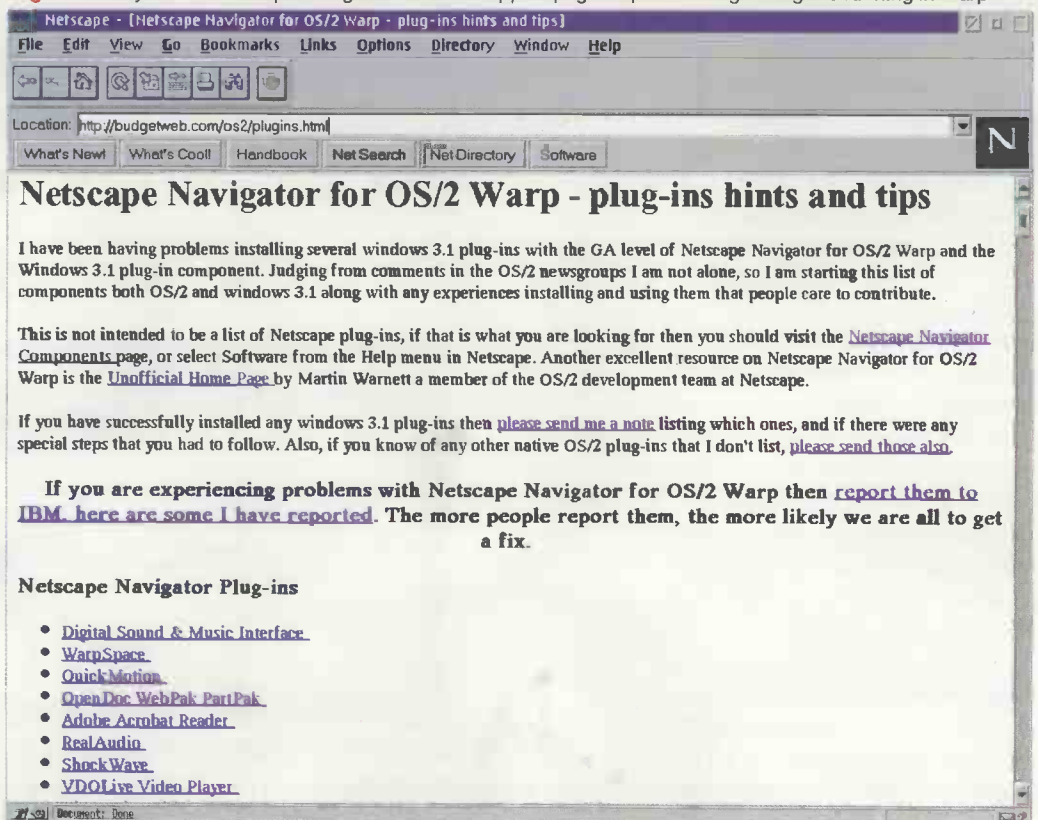
that his organisation was using an OS/2 SMTP mail gateway. As it happens, Lotus now has a gateway that runs on Windows NT, too, but it made me think of all those years during which OS/2 provided the backbone of that organisation's email system. I suppose in some ways, OS/2 is doomed to be first!

Interestingly, IBM, through its Lotus subsidiary, is now cashing in on the widely held perception that Windows NT is the one and only future direction of server computing, although it irritates OS/2 fan-club members no end. Because OS/2 used to be the preferred platform for Lotus Notes, it is now Windows NT that leads out new Lotus releases. Naturally, Lotus continues to ship multiple-platform versions including OS/2 Warp thereafter, so there is always a choice of platforms.

There are sound business reasons for this change. A lot of marketing money is being thrown at Windows NT and, as it is free, it therefore makes sense for Lotus to utilise it. Additionally, it makes it easier for Lotus to compete directly against Microsoft's groupware and office suite, and for users to compare the two.

Somehow, as much as I like Warp's stability and user interface, I do not think that facing-off SmartSuite for OS/2 against

Fig 2 This very useful Netscape Navigator for OS/2 support page helped me to get Plug-Ins running in Warp



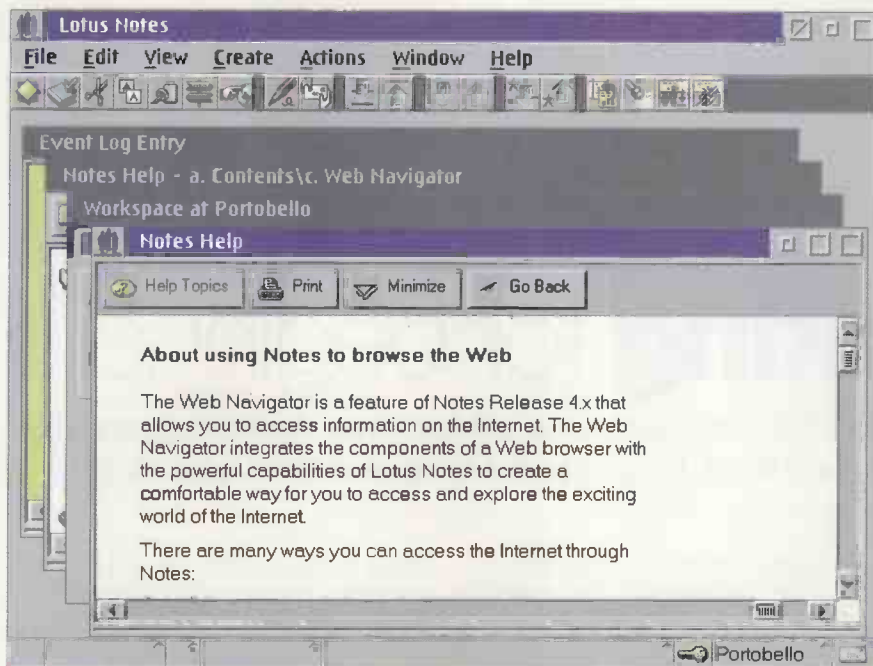


Fig 3 Lotus Domino 4.5 runs on OS/2, all versions of Windows, the Mac and Unix systems

Office 97 would have been a successful business decision.

Domino spotted

The Plug-Ins Hints and Tips page for Netscape Navigator for OS/2 Warp at budgetweb.com/os2/plugins.html is a mine of information and useful even if you don't think you'll be using Plug-Ins (Fig 2).

The latest downloadable version of the Lotus Domino web server, version 1.5a for OS/2 (and several other platforms), is on the Lotus web site. There is a lot said and written about the difficulty of making money on the web but not much about saving money on the web by delivering timely and effective support, let alone saving money by using web-based support.

The "a" in the Lotus Domino Web Server version 1.5a refers to a security update which corrects a problem in version 1.5 where a web browser coming in from the internet (not on a LAN) could impersonate a user. Lotus was informed via the web and used the same medium to deliver a fix and notify users. It was a web problem, but as with Netscape and Microsoft when they discovered security holes in their products, the web helped Lotus and its customers in a timely manner.

The other point of note about Lotus Domino 4.5 (Fig 3) is that it is the add-on which devoured its host. Originally (less than twelve months ago) Domino merely added web protocols to the Lotus Notes server. Now, Lotus has changed the name

of its flagship multi-platform groupware application development environment from Lotus Notes to Lotus Domino. From Release 4.5, the Notes name is only retained by the Notes desktop clients. As the pace of web development heats up, it is only a matter of time before newer developments like the IBM/Netscape link-up and consequent Netscape Communicator groupware web client, reduce the importance of Notes clients.

■ *I have received some Warp Server tools from a reader with a very large network, and have been given a pointer to a couple of Java games, all of which I hope to be able to bring you next month, plus some network-specific advice for Warp and Warp 4 users.*

On the CD-ROM

Having burnt my fingers on beta timeouts I am now wary, so the follow-up to last month's cover-mounted CD is an OS/2 Dialer in version 1.0, a totally pointless Simpsons guide and a pair of Novell updates, the OS/2 Utilities for NetWare 3.12 and 4.10, plus the latest NetWare OS/2 Client V2.12. The self-extracting ZIP (run it to expand onto a drive from which it can be installed) requires in excess of 6Mb of free space.

PCW Contact

Terence Green can be contacted by post via the PCW office or at os2@pcw.vnu.co.uk

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Bookmaking for beginners

Tim Nott shows you how to make five come alive as he presents a solution to the perennial problem of producing A5 booklets in Word. Plus, coloured margins and the right accent.

The vexed question of A5 booklets has bubbled away in these pages for some time. Mike Samuelson asks if anyone has come up with a simple way of doing this in Word. For those of you who weren't in at the start, the problem is this. You want to print two pages side-by-side on a sheet of A4 paper, and fold the sheet (or several sheets) in half to make a booklet. In the simplest, four-page case, pages four and one are on one side of the paper, pages two and three on the other. With eight pages, it goes 8-1, 2-7 on the first sheet, 6-3, 4-5 on the second. And so on, with a sixteen-page booklet going 16-1, 2-15, 14-3, 4-13 etc.

If you want a simple way, then here goes. For argument's sake, let's say this is an eight-page booklet called "Cooking With Carrots" by B. Bunny. Go to Page Setup, under Page Size choose A4 and under Orientation choose Landscape. From

Layout select Different Odd and Even and choose Different First Page in the Headers and Footers panel. Make sure Apply to: is set to Whole Document. Go to Margins and tick the Mirror Margins box. You'll notice the Left and Right change to Inside and Outside. Set Inside to 17.5cm, Outside to 2.5cm. You can fine-tune this further, but the principle is that the inner margin should have 14.85cm (half the sheet) added to it. Close the Page Setup dialog and go to View/Headers and Footers. On the first page you probably won't want either, so go to page two. Click in the header panel and type "Cooking With Carrots". In the footer, insert Page Number. On page three, put the author's name in the header and right-align it. Insert the page number in the footer, as before, and right align that. The remaining headers and footers will be filled in automatically.

You're now ready to print. Set your

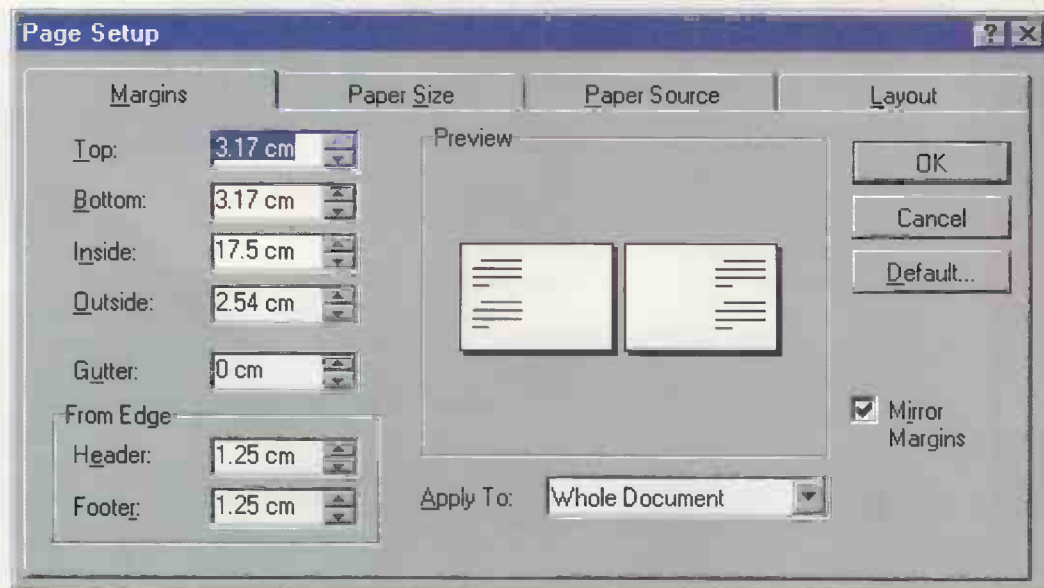
printer to single-sheet mode, and from the Print dialog Page Range panel, select Pages and type in "8,1,2,7,6,3,4,5". When the first page is printed, put the paper through again, the same way up. Then turn the paper over, top to bottom and again put it through twice. Repeat with the second sheet. And that's it. You can experiment further, for instance centring the headers and footers or adding a rule with the border tools. The only tricky bit is feeding the paper in the right way around.

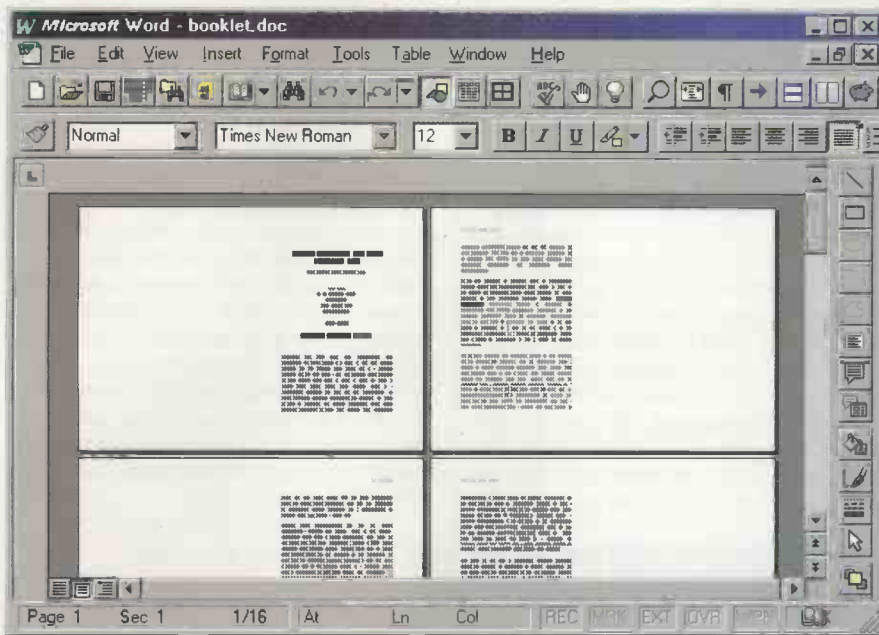
In hope of a more hi-tech approach, I searched various online sources of Word wisdom and finally came across a set of macros on the Microsoft web site, dating from November 1994. This included the FormatFoldOverBooklet macro, which "allows you to print multiple pages on a single printed page. The macro copies your document text to a new document window, changes the formatting to two columns,

and switches the orientation to landscape. The appropriate page numbers are added below each column."

This sounds just the job except that first, there's a syntax error in the macro that has lain uncorrected all this time, although a further "application note" describes how to rectify this. Having duly mended the macro, it then ground to a halt with a message saying the settings I'd chosen for the margins,

Setting up the page for an A5 booklet





The booklet ready for printing

column spacing or paragraph indents were too large for the page. It did this with a variety of settings in a variety of documents in both Word 6 and Word 7. At this point I did the sensible thing and gave up. Should you, however, have more time to waste than I do, the text of the macro is on this month's CD-ROM in BOOKLET.TXT.

A commanding view

Moving on from a long Word macro that doesn't work, here's a short one that does.

```
Sub MAIN
ListCommands
End Sub
```

This produces a new document consisting of a table showing all the Word menu and keystroke commands together with their menu location and/or keyboard shortcuts, including any keystroke combinations you have assigned. However, there's a rather more elegant variant. Since ListCommands is itself a Word command, you can add it to a menu. Go to Tools/Customise/Menus. From Categories choose All Commands; from Commands choose ListCommands; from Change What Menu pick the menu in which you want to park it. Mine's under "Help" but "Tools" would be equally appropriate. Change the menu position and name if you want to, then click on Add. Running the command from a menu in this way gives you the further option of listing all the Word commands including those which don't have a menu or keystrokes assigned, like those commands used only within macros.

Turning the tables

Last month we took a hard look at Word's inadequacies in the table department. Since then, I've got hold of a copy of the final build of Office 97 and must admit there's been an improvement. You can now align text top, bottom or centre of a cell and rotate it through 90 degrees without recourse to WordArt. This should solve the problem, mentioned last month, of the user who wanted to include a landscape full-page table in a document while keeping the headers and footers in their default portrait position. You can split and combine cells either from a dialog box or by drawing and erasing lines straight onto the table.

Despite the addition of an Autosum button, the mathematical features are pretty much unchanged and have a long way to go to catch up with WordPro or WordPerfect. I really had hoped that at least the formulae would instantly update, as in a spreadsheet, but no — you still have to highlight the field and update it with F9 (or the right-click menu) or wait until you print the document when all fields should be updated automatically. Make sure Update Fields is ticked in Tools/Options/Print.

From the top...

My other disappointment is with the unlovely File/Open... dialog, which remains virtually unchanged. I like being able to specify a search string from the top level of the dialog. It's especially useful when I know I've covered a topic somewhere in a PCW article, but can't remember which of

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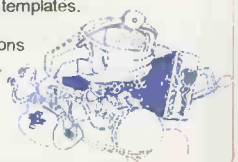
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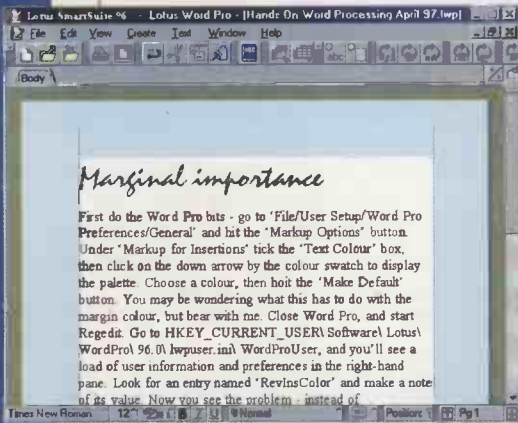


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Department of obscure tips...



This one's for Word Pro running under Windows 95. As you may have discovered, in layout view, you can set the margins to appear in a contrasting colour to the rest of the page with View/Set View Preferences/Show margins in colour. What's rather more difficult is to choose a colour other than the default grey — but it can be done. It involves adding a key to the Windows 95 Registry, so the usual caveats apply — back up USER.DAT and SYSTEM.DAT first.

First do the Word Pro bits. Go to File/User Setup/Word Pro Preferences/General and hit the Markup Options button. Under Markup for Insertions, tick the Text Colour box, then click on the down arrow by the colour swatch to display the palette. Choose a colour, then hit the Make Default button. You may be wondering what this has to do with the margin colour, but bear with me. Close Word Pro and start Regedit. Go to HKEY_CURRENT_USER\Software\Lotus\WordPro\96.0\lwpuser.in\WordProUser, and you'll see a load of user information and preferences in the right-hand pane. Look for an entry named "RevInsColor" and make a note of its value. Now you see the problem — instead of

Instead of user-friendly names like Arctic Blue, colour options are stored in the Registry as a number. Create a new String Value by right-clicking in the right-hand pane, and call it MarginsColor. Double-click on this new entry and give it the same number (including any minus sign) as RevInsColor. I must confess I haven't tried this with the Windows 3.1 version, but I would imagine something similar exists in LWPUSER.INI. Close the Registry Editor and restart Word Pro: your margins will now be in the chosen colour, and you can re-set the Markup colour to its previous value. If someone can tell me how to change the background colour, the area "off the page", to something other than the dismal default khaki, I'd be grateful.

And here's one for WordPerfect 7 fans. If you want to insert accented characters, or those such as fractions, not normally accessible from the keyboard, then Insert/Character pops up a scrolling box of accented and other exotic characters. You also get the option to choose from other character sets, such as mathematical symbols or Japanese characters. This is a little long-winded if all you want are commonly-used symbols such as °, Ω or the basic accented letters. The keyboard shortcut Ctrl+W also launches the character box, but you can follow this with further keystroke shortcuts like 'e<return>' produces an e-acute (é). These are the more common symbols:

- 'a = á (also works with e, i, o, u, y in both upper and lower case)
- `a = à (also works with e, i, o, u, y in both upper and lower case)
- ^a = â (also works with e, i, o, u in both upper and lower case)
- @a = å (also in upper case)
- ~a = ã (also n, o in upper and lower case)
- "a = ä (also e, i, o, u, y in both upper and lower case)
- ,c = ç (also upper case)
- oc = ©
- or = ®
- ae = æ (also upper case)
- ss = ß



Top left Margins in any colour you like — with a bit of Registry tweaking

Above Beyond the keyboard in WordPerfect

Right The secret of finding out the colour code



the 200-odd DOC files it might be in. So why do we have to dig down into the Advanced settings (or click the obscure Commands and Settings button) to search subfolders? Surely this checkbox should be at the top level?

Unless you specifically save the search, the results are lost when you close the dialog. Word 6's Find File... command at least had the decency to re-open the last set of results, so you could pick and choose without having to repeat the search, or open all the files at once.

To boldly go...

John Carrick was rather puzzled that Word had suddenly started displaying

everything in bold type when a new, blank document was created. Stuart-Melville wanted to know how to force Word to start with other than 10-point Times New Roman as the default font. "I have a rather elegant Garamond, but it's a drag having to set this manually for every new document." The answer to both queries is in the Format/Font... dialog box.

If you change the font, style, size or other options here, and hit the Default button, this font and options will become the default for new documents. You do get a confirmation dialog, but it's easy to miss if you're in the habit of closing dialogs with the enter key rather than the mouse. This is probably what has happened to John, by accident.

To rectify this, or to choose a new default, choose the settings you want from the dialog box and hit Default again. Don't forget to click Yes when asked to save the template changes. For those of you who have made the upgrade to Word 97, note there's also a Shadow font style as well as Outline, Embossed and Engraved. This looks rather like bold at normal font size, and it doesn't have a button on the toolbar.

PCW Contact

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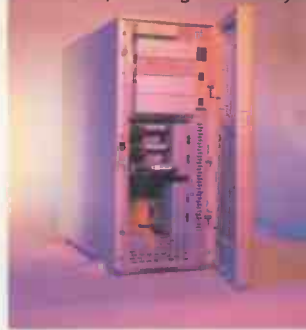
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AxionPro, showing RAID array



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Linking up

Excel 97 offers a number of ways in which to exchange information between a workbook and a web page; Stephen Wells explains how. Plus, Excel 97's hyperlink capabilities.

A worksheet which is specially designed to accept data from a particular web page is called a Web Query. To run one, you choose Data, Get External Data, Run Web Query, then select the particular Query you wish to run from the Run Query dialog box. Excel 97 includes four of them, as I mentioned last month, but one of these is "Get More Web Queries". At present, if you run that when connected to its source, you can download an active sheet with 36 more Queries.

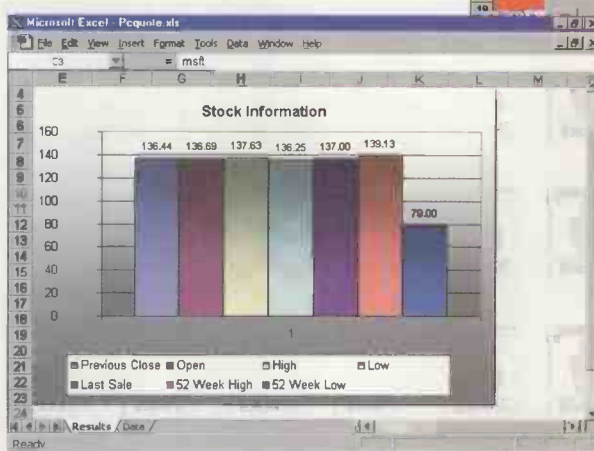
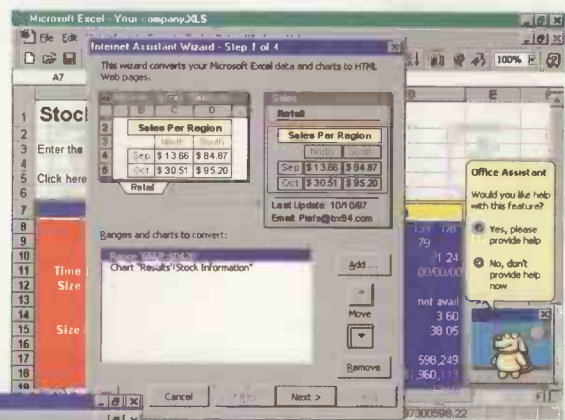
If you have your own web page, it's easy to add a range of a worksheets:

1. Open the page with your usual browser.
2. Choose View, Source, so you can see the HTML code.
3. Where you want the new worksheet data to appear, insert a blank line and then `<- -##Table## ->`
4. Save this edited file.
5. Open your worksheet in Excel and select the range you want to add to the web page.
6. Choose File, Save as HTML (Hypertext Mark-up Language). This starts the Internet Assistant Wizard (Fig 1) and you follow a few simple steps. These include browsing to select the .html file you've prepared for accepting the data. When you've finished, the range will appear on the web page.

You also use this Wizard to prepare a worksheet as a web page. It works much better now than when I previewed it last October. If you just accept all the defaults, the Wizard selects enough of the first range of your worksheet to fill a web page, then it

Fig 1 (right) It is easy to save a range of your worksheet as an HTML-coded web page, automatically, using the Internet Asst. Wizard

Fig 2 (below) The Excel 97 Web Connectivity Kit includes a template for converting downloaded data into charts



creates a new HTML-coded page complete with header, footer and table. This can be opened in Microsoft Explorer or your other favourite browser.

Excel 97 also makes it easy to add an Excel form to your web site which can be used for collecting information for a database. This might be for taking orders from users, or requests for information, or just recording comments. You first create the form in Excel with cells where users will enter their data. Then choose Tools, Wizard, Web Form to open the Web Form Wizard which asks you to select those cells on your worksheet that you wish to have

the user fill in, and the labels you wish to give them. It then automatically produces a new .xls file and companion .idc, .htx, and .mdb files. You supply these four files to the web page administrator and you can open the new .xls file, which looks like your original, with a Submit Info button added. This Wizard works best with Microsoft Access 97 and Microsoft Explorer 3.

On this month's cover-mounted CD I've included the complete Excel 97 Web Connectivity Kit. It's the definitive guide to developing sophisticated web sites for Excel users. It also helps you to create special pages on Excel worksheets that will automatically elicit information from company intranets or specific internet web sites. You can learn how to pull daily sales, stock or financial reports from a company intranet server straight onto a worksheet. The Excel 97 Web Connectivity Kit includes an example of converting downloaded data into charts (Fig 2).

Meanwhile, back in the office...

The hyperlink capability of Excel 97 can also be used to improve links with files on an office network, or on your own disks: hard,

or mounted floppy. If you just want a hyperlink from one Excel worksheet to another without the use of a formula, the easiest way is to select the worksheet data in the destination workbook and then use the right mouse button to drag the information to the worksheet cell that contains the text, button or graphic for the hyperlink. When you release the right mouse button, click Create Hyperlink Here on the shortcut menu (Fig 4).

It's also easy to create a hyperlink between a worksheet and a Word document or a PowerPoint slide. Say you have the text, SEE REPORT, in a cell and the report referred to is a Word document. Just select the cell and then click the Insert hyperlink button on the standard Excel 95 toolbar (or press Ctrl+K). This opens a dialog box where you can browse to find the Word file. Click OK and that's all there is to it. The words SEE REPORT are now an automatic link which opens the Word file when you click them.

As you were

Last month I was saying that Excel 97 allows you to use row and column labels as references, assuming that you've checked the "Accept labels in formulas" box under Tools, Options, Calculation.

I mentioned that in the beta version I tried, this feature easily got confused when one of my labels was "Current Assets" and another was "Current". I also said that if the column heading was a formula, like =B1-1, instead of 1995, then I received an error message even though the sheet displayed

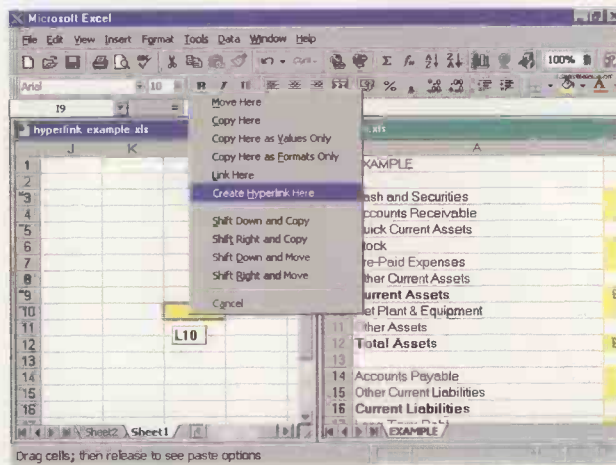
Fig 4 You can create direct hyperlinks simply by dragging a cell from one Excel 97 worksheet to another and right-clicking

1995. I've since received the final version (if there ever is a final version) and can report that both of these minor problems have been corrected.

VBA changes

The Excel 97 Visual Basic object model has extensive changes to support new and improved features in Visual Basic for Applications in Office 97. Many objects, properties and methods have been replaced. To provide backward compatibility, most of the replaced components have been hidden rather than removed. They don't show up with the object browser although the existing code that uses the hidden components still works. When you write new code you should use the new objects, properties and methods.

The first thing to get used to is that macros are not displayed on module sheets any more although they are still stored with the workbook. To create or edit a macro you choose Tools, Macro, Visual Basic Editor (or press Alt+F11) and three windows open (Fig 3). Visual Basic now features a single, consistent editing environment for Office programs similar to working in standalone Visual Basic 5.0. Each Excel



workbook has a project associated with it. There is an improved code editor, a hierarchical object browser, a multipane debugger, a Properties Window and a Project Explorer to help you view and organise the code and objects in your project.

If you open a workbook created in earlier versions of Excel, Excel 97 preserves macro and dialog sheets and converts module sheets into modules in the workbook's Visual Basic project.

You can run and edit Excel 4.0 macros and Excel 5.0 and 7.0 dialog sheets. To view them, just choose Tools, Macros (or press Alt+F8). You can even add new macro or dialog sheets by right-clicking a sheet tab and then clicking Insert on the shortcut menu. However, it is recommended that you create new macros and dialog boxes in the Visual Basic Editor.

The three largest areas of change in Excel 97 Visual Basic are Shapes, UserForms and Command Bars.

Shapes are drawing objects. The Shape Object is for formatting or modifying a single shape. The Shapes Collection is for modifying all the Shape objects on a specified sheet, such as AutoShape, freeform or OLE objects. The ShapeRange Collection is for modifying a group of Shape objects which you specify.

A UserForm Object is a window or dialog box that makes up part of a custom application's user interface. The UserForms Collection is a collection whose elements represent each loaded UserForm in an application. The UserForms collection has a Count property (which specifies the number of elements in the collection), an Item property (to specify a specific collection member), and an Add method (for placing a new UserForm element in the collection).

CommandBar Objects in Office 97

EXCELLent changes in Excel 97

- The Chart command on the Insert menu now starts the Chart Wizard. On step four of the Chart Wizard, you can specify whether the chart is inserted as an embedded object on a worksheet or on its own chart sheet.
- The Office Assistant has replaced the TipWizard from versions 5.0 and 95, and includes Answer Wizard IntelliSense technology from version 95. When you need Help, just click the Office Assistant button and ask the Assistant a question in your own words. When a yellow light bulb appears in the Assistant, a program tip is available: click the light bulb to see the tip.
- Cell notes are now called comments. Use the Comment command on the Insert menu to create a comment. You can view comments in the same way that you used to view notes: by resting the pointer over a cell that has a comment indicator (this is a red triangle in version 97) in the upper right-hand

- corner of the cell.
- The Info Window feature is no longer available in Excel 97. To locate cells that provide data to formulas, use the Auditing toolbar.
- The Shared List command has gone from the File menu. In Excel 97 you can use shared workbooks to create and edit formulae, change formatting, create and change charts, and even add sheets. To share a workbook, click Share Workbook on the Tools menu.
- Sound notes have also been dropped from Excel 97.
- To start the PivotTable Wizard, choose the PivotTable Report command on the Data menu.
- The View Manager command has disappeared from the View menu. Use the Custom Views command on the View menu to save a custom view of a workbook. Custom views have been integrated into Excel 97 and this command no longer requires an add-in program.

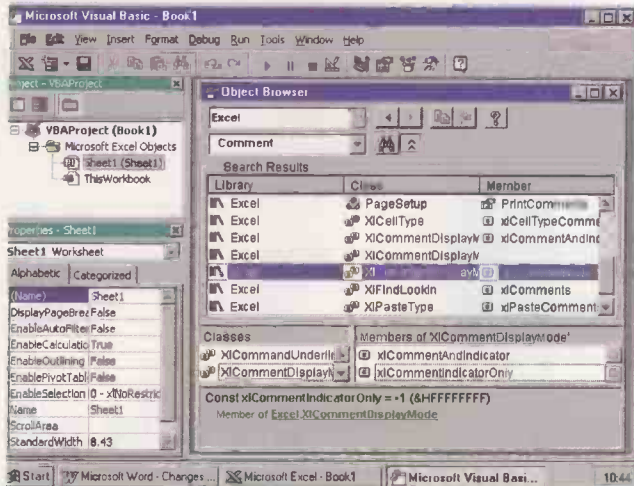


Fig 3 The new Visual Basic editing environment is the same in every Office 97 application and it's all graphically orientated

```
Then
myCell.Value = Application.Proper
(myCell.Value)
End If
Next myCell
End Sub
```

for your macros in Excel, you can borrow one from Word.

If you have MS Office 95 or 97, start Excel and Word. If you choose View, Toolbars, Customise, Commands, All

I sent this to Andy, who replied: "Thanks for your help — that cracked the problem. I guess it's simple when you know how!" I hope they both see this so that Andy knows where the solution came from and Jeff knows that he did a good deed.

Keyboard conundrum

Roy Small emailed me with an interesting dilemma. "I have a persistent keyboard problem with Excel 7.0 and Word 7.0. When I type a repeating comma (,,,,,) I get repeating (....) full stops. It only happens in these two applications and I have tried reinstalling twice, but to no avail. In the Turnpike editor and in Wordpad there is no problem. My system is an Escrom P60 with 16Mb and Win95. Word 5 and Excel 5 did not have this problem. All the country settings are correct.

"I am loathe to delve into the registry unless I know what I'm looking for. I would appreciate a pointer in the right direction if you are aware of this problem."

I replied: "If you're getting correct results with other software, then it can't be a keyboard mapping problem.

"You might check all the AutoCorrect and AutoText options. If anyone else has used your PC, they might have changed something, either consciously or inadvertently. Also (and this is something that often frustrates me) languages are set in every template. You can't just set English (British) once. It can turn back to English (US) or, perhaps in your case, Swedish or something, in different templates.

"If it's any comfort, it's not a bug in Excel 7 or Word 7 as nobody else has had the problem as far as I know."

He responded: "Brilliant, Stephen. I can't thank you enough. It was indeed the AutoCorrect setting. I don't understand why or how it ever got set that way because only I use this machine and I have never found that setting dialog before. Changing the setting in Word also affects Excel."

control the toolbars, menu bars, and shortcut menus in a workbook. Not only can you create and modify custom toolbars, menu bars and shortcut menus for a tailor-made Visual Basic application, but you can also modify any of Excel's own built-in toolbars and menu bar. You can present the features of your application as individual buttons on toolbars or as groups of command names on menus. Because toolbars and menus are both considered to be command bars, you use the same kind of controls for both.

Having installed Office 97, you can find much of the information you need about these changes in the vbax18.hlp file. Some useful snippets are in the file xread8.txt.

Office 97 includes an MS Query Add-In to convert external data ranges which are in Excel 97 format to Excel 5 for Windows 95 format. This is not so much for making Excel 97 data available to version 5/95 users, as for allowing Excel 97 users to run macros created in Excel 5.

Right on the button

I recently received a fax from Jeff Forrest, who is working in Paris for a company that has internal email only. Jeff offers the tip that if you run out of suitable button designs

Commands in Word, you're offered a wide choice of button designs, any one of which can be dragged onto any toolbar (temporarily).

Right-click on this button and choose Copy Button Image. Drag the button off the toolbar to dispose of it, then switch to Excel. Whenever the Toolbars Customise dialog box is open, the same shortcut menu is available in Excel, so now you can right-click on the button which starts your macro and choose Paste Button Image. This new button will be stored in the Normal.dot template and will stay on the toolbar until you wish to remove it.

A case in point

In his correspondence, Jeff also included a macro for changing the case of selected text. I entered and checked his module and it worked fine, but as I had covered that subject extensively (in my January column), I wasn't going to mention it.

But then I received an email from Andy Male: "I read with interest your article on changing the case of text within Excel. I'm using Excel 5.0 and have successfully created a macro button that will change the case of a single cell. I am trying to amend the macro so that I can change the case of a single cell, or a selected range, but despite hours of effort I have failed. The macro I'm using for the single cell is:

```
Sub titlecasecell()
ActiveCell.Value = Application.
Proper(ActiveCell)
End Sub"
```

So all of a sudden, Jeff's macro became immediately useful. He had written:

```
Sub MakeProper()
Dim myCell As Object
For Each myCell In Selection
If Left(myCell.Formula, 1) <> "="
```

On the PCW CD-ROM

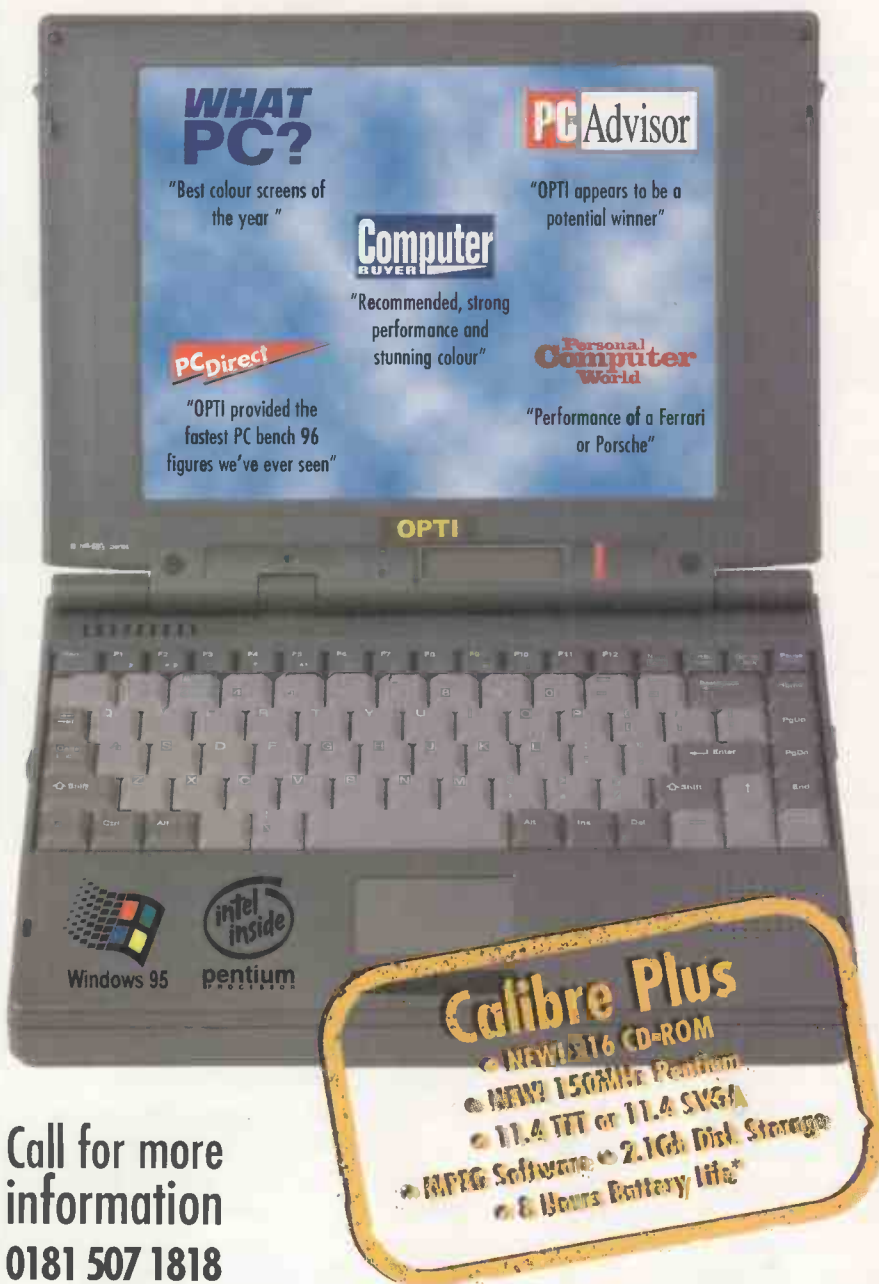
If you have Excel 97 and Word 97 installed on your computer, you can use the Excel 97 Web Connectivity Kit described here. From the cover CD, copy the self-extracting zip file, WEBCNKIT.EXE, into the folder of your choice on your hard disk and double-click on the icon to expand the files. Follow the instructions in WebCnKit.doc to use the various sample files. Descriptions of the files are in this document's appendix.

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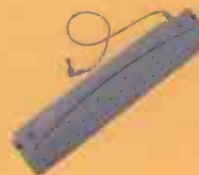
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All buttoned up

Mark Whitehorn presents another slant on last month's buttons and captions query, which is far from sewn up. Plus, the complexities of data entry in Access, and CUSTOMER care.

In the February issue I published a letter from Glen Rowe. He wanted multiple buttons on a form, all with different captions. Whenever a button was pressed, a query would run which returned values based upon the caption on the button. For example, if you press the button labelled "Penguins" you see the records which relate to Penguins: pressing the "Fish" button yields information about Fish. I produced a solution by building a query which snatched the caption from the button which had just been pressed.

I also wrote the following: "The obvious solution at first is to try to pass the button's caption to the query as a parameter. As far as I know (and I stand to be corrected) this can't be done."

James Talbut replied: "Passing a parameter to a parameter query in Access can be done, but it's not very pleasant and means the you need to use DAO (Data Access Objects), which can be good or bad depending on the circumstances."

The solution that James then provides does, as he suggests, pass a parameter to a parameter query. What it doesn't do is pass the *caption* of the button as a parameter (which is still, as far as I know, impossible). In turn, this means his solution is somewhat more awkward than the one shown in the February issue because every button you add to the form must have its caption *and* its OnClick property altered. With the February solution, all you had to do was clone the button and alter the caption. However, James's solution to the initial problem is still well worth studying since it illustrates a very different way of solving the conundrum.

He continues: "Before I include all the bmf to show you how it's done, I'll just

Fig 1 Query, "Person":

```
SELECT DISTINCTROW People.ID, People.Name, People.Value
FROM People
WHERE (((People.Name)=[Person]));
```

Fig 2 Form Code, behind "People"

```
Private Function Button_Click(sName As String)
Dim qdfPeople As QueryDef
Dim rsPerson As Recordset
Dim sRowSource As String

Set qdfPeople = CurrentDb.QueryDefs("Person")

qdfPeople.PARAMETERS("Person") = sName
Set rsPerson = qdfPeople.
OpenRecordset

While Not rsPerson.EOF
If Len(sRowSource) > 0 Then sRowSource = sRowSource & ","
sRowSource = sRowSource & rsPerson.Fields("Name") & " - " &
rsPerson.Fields("Value")
rsPerson.MoveNext
Wend
List10.RowSourceType = "Value List"
List10.RowSource = sRowSource
End Function
```

mention the implications.

"To actually access the resultant data you need to use DAO to step through a recordset. If you have a large amount of data this can be inefficient (OK, it's always inefficient, but it's more noticeable with a large dataset), particularly if you are intending to perform some secondary operation/selection on the data. However, the query itself is still run by the JET engine so the main data manipulation routines are still run as quickly as Access can do them.

"To control the parameters you need to use the Parameters collection of the QueryDef object for the query you are

interested in. The most simple example I could come up with looks like this:

Table: "People"

ID	Name	Value
1	Fred	1
2	Jack	4
3	Fred	9
4	Harry	16
5	Anastasia	25
6	Bob	36
7	Martin	49
8	Stephen	64
9	Harry	81

(See Fig 1.)

Form, "People":

Six command buttons, each with their OnClick property set to:

```
=Button_Click("Fred")
```

with Fred replaced by the caption on that particular button. The buttons are labelled Fred, Bob, Harry, Martin, Anastasia and Stephen. At the bottom is an empty list box called List10.

(See Fig 2, page 285.)

"And that's it. Hope it's useful."

Very interesting, James. I have constructed an example file (in Access 7.0) based on this example called TALBUT.MDB which is on the CD.

Next an email from Norway: "I have a problem that I've worked on for several months now, without finding any easy solution," writes *Tore Saetre, of Bergen*. "I've developed and am maintaining a Microsoft Access database that keeps track of customers. The database contains two main tables: Customer and Sales. The problem is that I need to have a field in the Customers-table that shows how many orders the customer has in the Sales-table.

"My first idea was to make a query that counts orders in Sales for each customer. The query lists each customer and how many orders the customers has. I tried to move that value to the Customer-table with an update query that updates a NoOrders-field in Customer through a link to the first query. The problem is that the first query can't be updated and the second query won't update my Customers-table."

I receive many questions like this one, questions which hinge upon the desire to store redundant data in tables. My initial reply to Tore was that, in general, storing derivable data is a bad idea because if the data changes (as you make more sales), the data in the CUSTOMER table goes out of date. It is normally preferable to use a query to calculate the information you need: whenever you want to see this data, you can run the query which shows you the customer details and the number of sales.

Tore was only partially convinced and replied: "But data in the sales table is only changed and added to once a month. The rest of the month the user browses through CUSTOMER's 4,000 records and needs to see as much data on each customer as possible. Running a query for each customer is too time-consuming. I see why it can't be done in an ordinary customer/sales database, but I still hope to find a solution to this problem.

Fig 3 (right) Small samples from both the CUSTOMER and ORDERS tables in the database "Tore"

CUSTOMER No	TITLE	FIRST NAME	LAST
1	Mr	John	Knight
2	Mr	Alfred	Clark
3	Ms	Margaret	Winter
4	Mr	Duncan	Walker
5	Mr	Joseph	Whyte
6	Mrs	Norah	Cooper
7	Mrs	Helen	Lynch
8	Ms	Grace	Falcon
9	Mrs	Mary	Robb
10	Mr	George	Peders
11	Ms	Elizabeth	Chalmers
12	Mr	John	Walker
13	Mrs	Ann	Dick
14	Mrs	Helen	Taylor
16	Mr	Thomas	Falcon
16	Mrs	Lillian	Murray
17	Ms	Ethel	Holmes
18	Mr	Joseph	Ferrie
19	Mrs	Agnes	Angus
20	Mr	David	Whyte

OrderNo	CustomerNo	Order Details
1		2 Bar Bar
2		5 Foo
3		6 Baa Foo Baa Foo
4		4 Baa Baa Foo
5		6 Baa Foo Foo
6		6 Baa Foo Baa Foo
7		6 Foo
8		6 Baa Foo Baa
9		6 Baa Foo Foo
10		56 Baa Foo Baa Foo
11		636 Baa Baa Foo
12		54 Baa Foo Baa Foo
13		86 Baa Foo Baa
14		6 Baa Foo Foo
15		36 Baa Baa Foo
17		5 Foo
18		528 Baa Baa Foo
19		26 Baa Foo Baa Foo
20		5 Baa
21		6 Foo Baa Foo
22		6 Foo Baa Foo

Fig 4 (left) The form called "Customers & Orders" shows customer details and order details

"For an experiment, do you have an example of how I can run a query to see customer details based on the customer currently displayed in a form? Do I need to run a code, macro or function and how do I get the query to filter everything but the record on-screen? Thanks for your help."

Okay, we'll solve this one both ways. There is a sample database on the cover CD (in Access 2.0) called TORE.MDB. This has two tables, CUSTOMER and ORDERS. CUSTOMER contains simple details of 4,000 mythical people, ORDERS contains about 27,500 orders. Each customer has at least three orders to their name (or, in this case, to their CustomerNo) and some have considerably more. Fig 3 shows small samples from both tables.

The form called "Customers & Orders" (Fig 4) shows customer details and order details. The main form is based on CUSTOMER, the sub-form (which is called Sub1) is based on a query which simply

Fig 5 (below) The form called "Customers & Orders Count" shows one record for each customer

performs a join on the two base tables. This form displays one record for each of the 4,000 customers.

The form called "Customers & Orders Count" (Fig 5) again shows one record for each customer. However, instead of listing the details about each order, it simply shows how many orders each customer has placed. This form is based upon the query called "Customer & Order Count".

These two forms are variants which answer Tore's request for an "example of how I can run a query to see customer details based on the customer currently displayed in a form".

I ran this database on a 486/100 with

16Mb of RAM using Access 2.0. "Customers & Orders" opens almost instantaneously, and you can scroll through the records at the rate of about 400 per minute. "Customers & Orders Count" takes about 25 seconds to open, but once open you can scroll through the records at the rate of about 1,600 per minute.

To put this into simplistic terms, the first one does the calculations for each record as you ask to see it (which is adding about 0.1 seconds to the scroll time between each pair of records). The second one does all of the calculations for all of the records before showing any of them to you.

These forms are simply based on queries: no code or macros are required. As you can see, using the first form, it is possible to see customer and order details with essentially no speed hit at all for these numbers of records.

The query called "Customers & Orders Count" (the one which takes 25 seconds to

run) can also be used, if required, to create the base table that Tore requested. I have included a Make-Table version of the same query in TORE.MDB. If you run this, it will create a base table called CUST which is just like CUSTOMERS except that it includes a field which shows how many orders each customer has placed.

In Tore's case this could be run once a month, and then CUSTOMERS replaced by CUST; in that case, the 25-second speed hit disappears. The downside is that we are now reliant upon redundant data in the database. If anyone forgets to renew the tables at the end of the month, then all of the users of the database start to work with inaccurate data. You pay your money, you take your choice — speed or security.

Quickies

■ Here's a quick one from Gareth Wade: "When running a simple Report, I need to add all the time lengths and give a running

Fig 6

```
Private Sub LastName_AfterUpdate()

End Sub
```

Simply add a line so that it now reads;

```
Private Sub LastName_AfterUpdate()

    Me!LastName = StrConv(Me!
    LastName, 3)

End Sub
```

Fig 7

```
Me!LastName = StrConv(Me!LastName, 3)
```

Fig 8

```
Private Sub LastName_AfterUpdate()
Dim Length As Integer

Me!LastName = StrConv(Me!LastName, 3)
If Left(Me!LastName, 3) = "Mac" Then
    Length = Len(Me!LastName) - 3
    Me!LastName = StrConv(Me!LastName, 3)
    Me!LastName = "Mac" & Me!LastName
End If

If Left(Me!LastName, 2) = "Mc" Then
    Length = Len(Me!LastName)
    Me!LastName = Right(Me!LastName, Length - 2)
    Me!LastName = StrConv(Me!LastName, 3)
    Me!LastName = "Mc" & Me!LastName
End If
```

p288 >

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total. Easy enough; but when Access gets to 23:59, it reverts back to 00:00. What format do I use to carry on past that magic 24-hour mark? I have tried all the manuals and help files but can't find the answer."

I don't know the answer to this one. Anyone else care to solve it?

■ And this one from Malcolm Rowley: "I find I am put off by the complexity required in Access to solve simple problems, e.g. data entry character formatting.

In Alpha I simply have to specify the word/character format I require, e.g. Upper, Lower, Word (first character upper case, the rest of the data left as is) in the field rules, and this is applied to all data entry that takes place and can be re-applied to all existing data. This is ideal for data entry of names and addresses; the only difficulty being the McCartneys (etc.) of this world. To have any simple form of formatting that stores the data in an access table in a particular format, do I really have to resort to code? Is there a simple way of accepting data entry in Access and storing it as first character upper case, the rest left as is?

For example: macdonalds becomes Macdonalds / macIntyre becomes MacIntyre / 27 park avenue becomes 27 Park Avenue. A simple solution would be appreciated."

The answer is that you have to use code, but only one line so it may just meet your requirement for simplicity! Suppose you have a form called Capital which displays a field called LastName in a text box called LastName. Switch to design, double-click on the textbox in question, select the Event properties, click on the one called "After Update", click on the ellipsis button which appears (three dots) and choose Code Builder. Between the two lines which appear (Fig 6) "Me" means the current form, "LastName" is the name of the textbox, and "StrConv" is a function (only available in Access 7.0 and above) which converts strings. The "three" tells the string conversion function to do the type of conversion that you asked for (capitalising the first letter of each word).

So, Fig 7 means "make the contents of the textbox called LastName equal to the same as it is now, but with all of the first letters of the words capitalised". This will convert: penguin penguinsson to Penguin Penguinsson / 23 the larches to 23 The Larches / mcdonald to Mcdonald and so on.

■ On a slightly different tack, I haven't used Alpha for well over a year, but I agree that

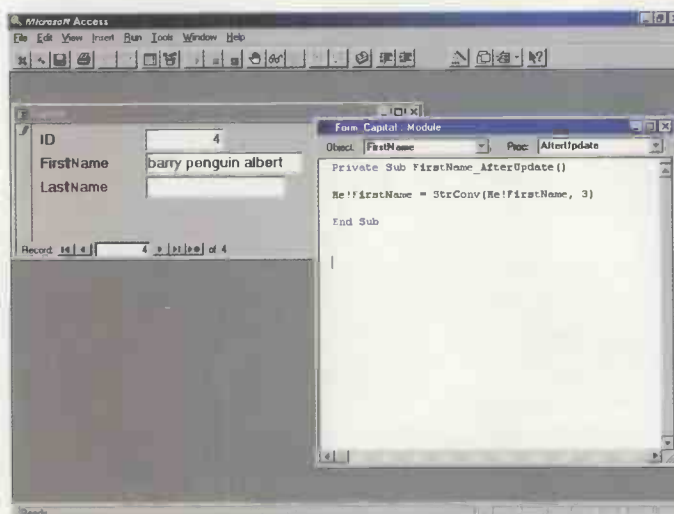


Fig 9 (left) This single line of code will capitalise all distinct words placed in the FirstName field (see Fig 10)

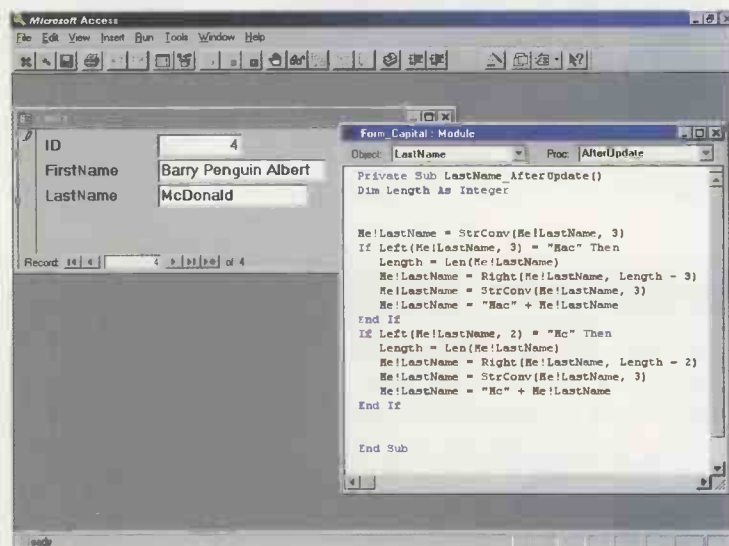
Fig 10 (below) This more complex code capitalises two of the more complex surname types in the LastName field

processes like this one are easier (and certainly more intuitive) in Alpha than in Access. In fact, to quote from a review I wrote at the time of its release: "...of these, the Field Rules are the most impressive, if only because Alpha copes with them better than any other RDBMS I have seen."

There is clearly a trade-off in design terms, which these two products exemplify. In both products, the designers identified a host of commonly needed functions and made them easily available from the interface. This approach has pros and cons. The good news is that commonly performed processes (like designing tables and building queries) are easy: the bad news is that if you happen to want a function that the designers didn't provide, you suddenly have to go to a more complex area, such as coding.

One difference between the two products is where the line was drawn. In this case, the Alpha designers decided to include capitalisation in the "easy" set and the Access designers didn't.

I have always found that, whatever product I use, I eventually reach a stage where I have to use code simply because it is impossible for the designers to put



everything into the "easy" set. On a happier note, once you do start to use code, your horizons expand considerably. You can, for example, begin to deal with unusually capitalised names like those you mention. If you expand the code to that shown in Figs 9 and 10, this will change macdonalds to MacDonalds, and mctavish to McTavish. (Also see the Access 7.0 sample database called ROWLEY.MDB.)

I am not suggesting that this is perfect code. As usual in the sample code I give, there is no error trapping. In addition, there are some people who prefer the letter after Mac or Mc to be left in lower case. This code is simply provided as an example of what can be done.

PCW Contact

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column at database@pcw.vnu.co.uk

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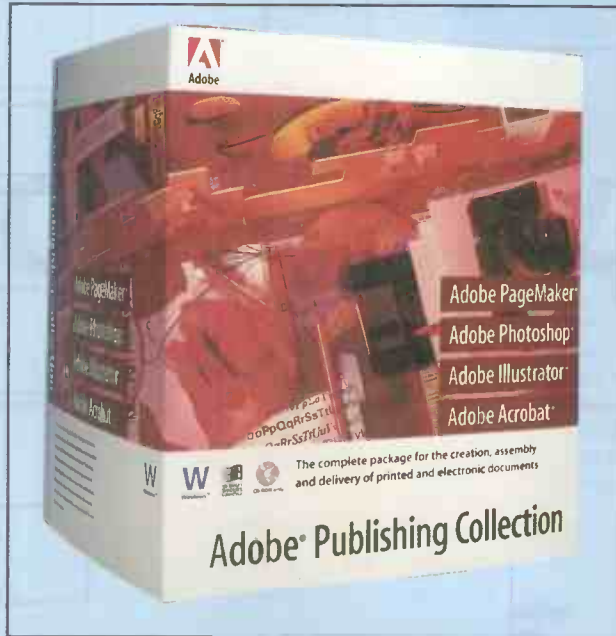
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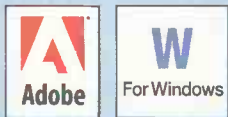
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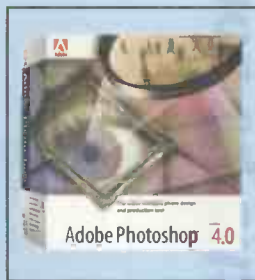
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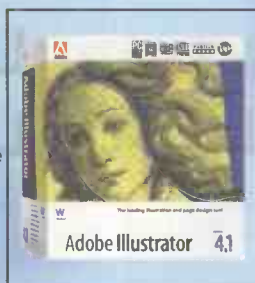


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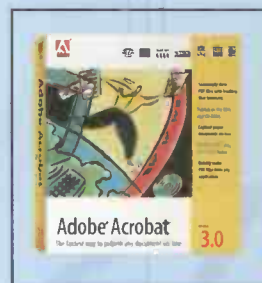


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Mods and rockers

Mike Mudge JAMS with mod sequences. No, he hasn't joined a retro band; here he presents a stimulating exercise in occurrences to get your feet tapping and your calculators clicking.

JAMS, or Jonathon Ayres Mod Sequences, are believed to have their origins in Leeds in the autumn of 1996. I am indebted to Jonathon for the following presentation of the idea which both he, and I hope readers of this column, will find interesting and stimulating.

Mod sequences

The mod sequence is defined as

$$X(n) = (2 * X(n-1) + 1) \text{ mod } n$$

where n starts at 1 and $x(0)$ equals 0. The first few numbers in the mod sequence are 0, 1, 0, 1, 3, 1, 3, 7, 6 and 3.

1. Occurrence of X

When does a number occur in this sequence? The first occurrence of the numbers 0 to 19 in the mod sequence

are shown in Fig 1.

All numbers less than 1,000 occur in this sequence, for n less than 10,000,000, with the exception of 204, 344, 614, 622, 876 and 964. These first occur at:

$X(n) = 614,$	$n = 10629529$
$X(n) = 204,$	$n = 15245143$
$X(n) = 344,$	$n = 26713415$
$X(n) = 622$	$n = 47286732$
$X(n) = 964$	$n = 67815823$

I have not been able to find the first occurrence of $X(n)=876$, but if it does occur n is bigger than 75,000,000.

2. Special values of $X(n)$

- $X(n)=0$ for $n = 1, 3, 79, 35, 431, 1503, 2943, 6059, 6619, 18911$ and 54223.
- $X(n)=n-1$, for $n=1, 2, 8, 32, 46, 392, 12230, 155942, 659488, 1025582, 10471228$ and 3437088
- $X(n)=n/2$, for $n=2, 78, 234, 430, 1502, 2942, 6058, 6618, 18910$ and 54222
- $X(n)$ and n end in the same last four digits for $n=34875, 52363, 54975$ and four others less than 100,000, and with the last five digits of both the same, the only values of n less than 1,000,000 are $n=389103, 469599$ and 742955.

3. Distribution of $X(n)$

- The most common occurring values of $X(n)$ are of the form 2^p-1 , so that for n less than 1,000,000, the number 63 occurs 47 times.
- The average value of $x(n)$ is about $n/4$.
- There are no values of n greater than 1 so that $X(n)=X(n+1)$, but for $X(n)=X(n+2)$ this is true for $n=6, 7, 12, 13, 24, 25, 174, 175, 2448, 2449, 3072, 3073, 6768$ and 6769.
- $X(n)+1=X(n+1)$ is true for the values of $n,$

Fig 1

First occurrences of the numbers Y, $Y=0$ to 19, so that $X(N)=Y$

Y	N	Y	N
0	0	10	149
1	2	11	27
2	53	12	91
3	5	13	18
4	71	14	21
5	26	15	17
6	9	16	43
7	8	17	20
8	19	18	29
9	72	19	50

Fig 2

First values of n so that $X(n)+a = X(n+1)$

A	X	A	X
1	3	11	151
2	6	12	29
3	55	13	93
4	9	14	64
5	73	15	29823
6	28	16	33
7	63	17	45
8	18	18	42
9	21	19	71
10	74	20	52

$n=3, 5, 81, 237, 433, 1505, 2945...$

Fig 2 shows the first values of n so that $X(n)+a = X(n+1)$. All values of a , less than 500, occur for n less than 10,000,000 except for 205, 215, 345 and 391.

- For pairs of numbers x and y , y is at most $2x+1$. The values of x where y has values other than $2x+1$, are $x=1,3,6,7,13,14,15, 16,17,18,20,23...$

Supernumerary

■ On 6th December, Tony Forbes of Kingston-Upon-Thames announced his discovery of a triplet of 1,083-digit primes, believed to be the largest known prime triplet. (Further details of these numbers and the underlying theory/computation on request — MM.)

■ Anyone who knows the means of obtaining a "zooming Mandelbrot plotter" please email Gogul@aol.com.

■ Anyone wishing to get involved in the "Great Internet Mersenne Prime Search" mentioned in PCW (Jan) should contact Nigel Backhouse, Division of Applied Mathematics, University of Liverpool, M&O Building, Liverpool L69 3BX (Kevin Edge, please note).

■ In response to frequent requests for reasonably priced (or free) software for long integer manipulation: I can provide UBASIC free of charge on receipt of a suitably stamped, addressed, padded bag.

Numbers Count (PCW, September '96) — 'Fraction Action'

■ Gareth Suggett obtained successive length records for the period of the continued fractions of the square roots of the non-square integers up to $d=10,000$, terminating with $d=9,949$ having cycle length 217. However, Gareth discovered a program called "CALC", written by KR Matthews of the University of Queensland. The MSDOS version is available from the Mathematics Archives ftp site: <ftp://archives.math.utk.edu/software/msdos/number.theory/krm-calc>. On a 25MHz 386 PC, each of the 10-digit results quoted in the original article can be obtained in about 20 minutes. The final 11-digit result was confirmed on a 133MHz Pentium in 15 minutes, producing a 6.8Mb output file!

John Borland observed that at some time, "continued fractions were a standard topic in higher mathematics". Readers' experiences of instruction in this topic would be most interesting, together

with their personally recommended reference books both for numerical and function approximation theory applications.

This month's prizewinner, however, is Duncan Moore of Birkenhead for his major contribution to "Something Different", spread over August 1993 and January 1997. The total number of solutions now known is 30.

Also in relation to this problem, Henry Ibstedt reported (November '96) finding one with three of p, q, r, s, t sharing one factor and the other two sharing a different factor. This solution is $p=286, q=154$ sharing the factor 2, and $r=s=t=11$ sharing the factor 11 with $(2, 11) = 1$.

Henry points out that p and q also share the factor 11 but that this was not excluded from the question — there is still a great deal of work to be done before this problem is fully understood.

(19th January edition, 1989).

Following up on the observation that $15226_{10} = 62251_7$ and further that $99481_{10} = 18499_{16}$ (where the subscript denotes the base in which the number is represented), find the lowest five-digit number (in any base). Generalise this process to n -digit integers.

Answering back...

Please send any investigations of the above problems to Mike Mudge at 22 Gors Fach, Pwll-Trap, St Clears, Carmarthenshire, SA33 4AQ (tel 01994 231121), to arrive by 1st July, 1997. All material received will be judged according to suitable criteria and a prize will be awarded by PCW to the best entry arriving by the closing date (an SAE is required for the return of entries). Each contribution should contain brief descriptions of the hardware and coding used, together with run times and a summary of the results obtained.

General comments on the topic of JAMS would be welcome, together with any practical (or unusual) applications of integer arithmetic in number bases other than 2 and 10.

Questions

- Do all numbers occur in this sequence, and also, do they occur an infinite number of times?
- Is there always a value of n , for every a (positive or negative) so that $X(n)+a = X(n+1)$?
- Is there a way of predicting when a number will occur in the sequence?

■ Is there a formula which gives the n 'th value of the sequence, without calculating the rest of the series?

■ What happens for other sequences, such as $x(n)=ax(n-1)+b \pmod n$ or $x(n)=(x(n-1)+x(n-2)) \pmod n$?

Something different

This item was taken from *Computer Weekly*

PCW Contact

Mike Mudge welcomes correspondence from readers on any subject within the areas of number theory and computational maths, together with suggested subject areas or specific problems for future articles. Email numbers@pcw.vnu.co.uk

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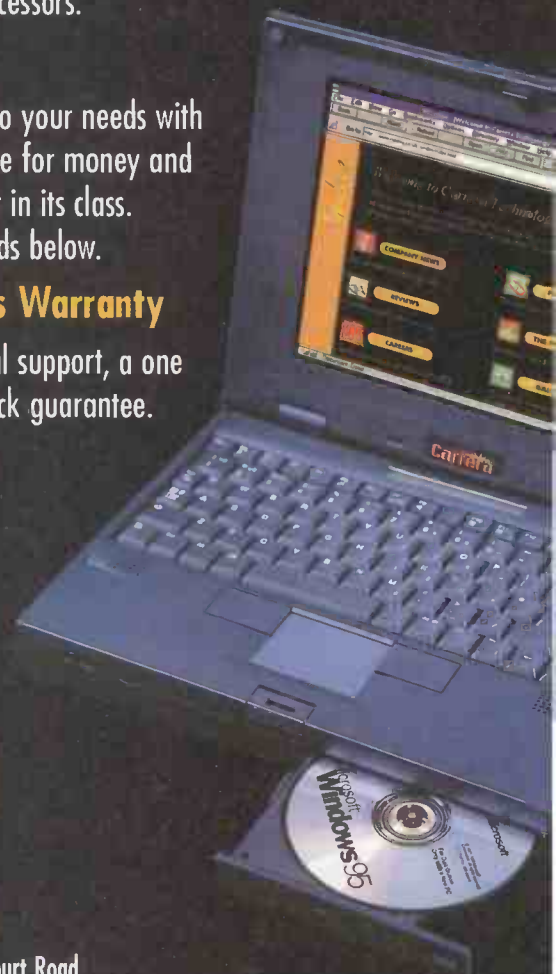
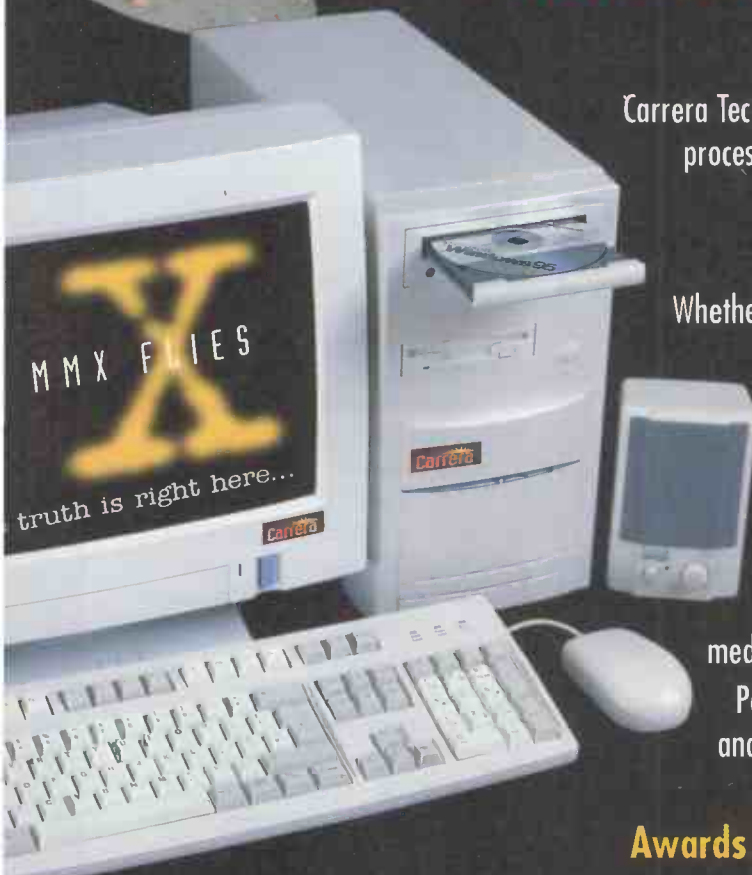
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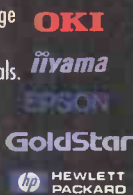
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Fraught in the net

Getting connected to the internet can be a risky and potentially expensive business. Roger Gann takes the worry out of it with a back-to-basics brief on what's what and where to get it.

I guess a reasonably high proportion of *Personal Computer World* readers regularly access the internet from their PCs at home, using a V.34 modem and a normal phone line. Such an act would have been rocket science a few short years ago, but today it's a routine event. For single users, this method, a modem plus a conventional phone line, is the most cost-effective internet access solution. But what if you wanted to give internet access to a group of users, say those on a small network? Well, there's absolutely nothing to stop you from scaling up the single-user solution and applying it to everyone on the network, buying them all a modem, giving them all a phone line and their own ISP account. It's feasible, but it's a less than desirable solution. Not only would it be a nightmare to configure and administer, but it would also be expensive to implement.

No, a much more elegant solution is to integrate internet access into your network. The good news is that, depending on your

Router alternative

Installing TCP/IP on a lot of workstations is enough to make a network administrator cry. Luckily, Bay Networks has an alternative internet access solution for those wedded to the NetWare standard. Instant Internet 3.1 is an IP/IPX gateway server package, a hardware/software combination that allows NetWare users to access the internet without having to worry about configuring TCP/IP on top of an IPX stack. It effectively permits workstations to access the internet using just the NetWare IPX stack — only the Instant Internet server uses TCP/IP. The downside is that it's not particularly cheap — a 50 concurrent user ISDN version is priced at £4,329 and it can be awkward to configure. www.baynetworks.com/

```
Telnet - 195.40.34.
Connect Edit Terminal Help
x00-100 Sys Config
x>Name=activ8-gw
x Location=
x Contact=
x Tern Rate=9600
x Console=Standard
x Remote Mgmt=Yes
x Sub-Adr=None
x Auto Logout=Yes
x Idle Logout=0
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x x10-100 1
x x Link P
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x x> 1 Active
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x x20-300 WAN Stat
x x>Rx Pkt: 62534^x
x x Tx Pkt: 57699 x
x x CRC: 94ux x
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x x00-100 Sys Option
x x>Security Prof: 1 ^x
x x Software +4.6A+
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x x00-200 19:46:17
x x>M31 Line Ch
x x LAN session up
x x as-isdn1
x x Qual Good 00:14:02
x x 64K 1 channels
x x CLU 0% ALU 0%
x x20-400 Ether Stat
x x>Rx Pkt: 1065566
x x Tx Pkt: 59354
x x Col: 45
x lqqqqqqqqqqqqqqqqqqqqqqq lqqqqqqqqqqqqqqqqqqqqqqq
x x00-400 HW Config
x x>BRI Interface
x x Adrs: 00c07b5e5ad9
ux x Enet I/F: UTP

Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
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Complicated or what? You can telnet in to your ISDN router once it's been configured, but as you can see, configuration isn't straightforward

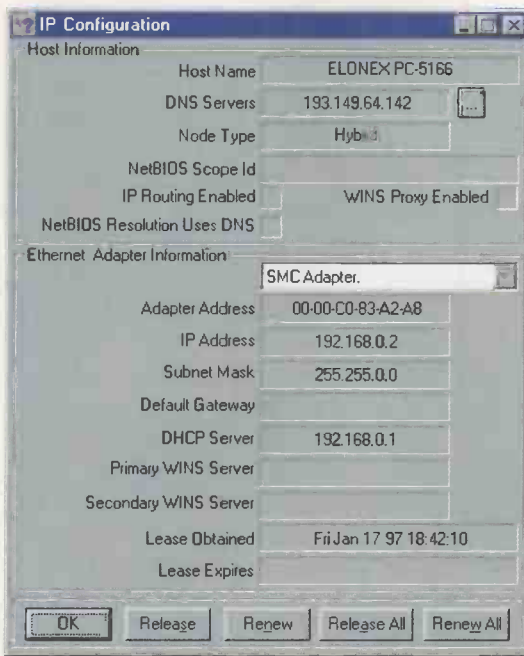
precise needs, you may not have to fork out for expensive new kit in order to do this. In fact, for most companies the expense will be relatively trivial. There are basically two choices available: email-only or full-blown internet connectivity.

Email only

I suspect most companies, even small ones, running even modest networks, rapidly appreciate the benefits of email, often provided as a standard feature in their NOS (e.g. Windows 95 or Windows for Workgroups 3.11) and soon find themselves making heavy use of internal email. So it makes a lot of sense to consider extending the existing email connectivity to embrace the internet — sending an email is probably the cheapest method of global communication available.

For email purposes you don't need

instant or continuous access to the internet, nor do you need a particularly fast connection: emails tend to be reasonably compact and the throughput offered by a 33.6Kbps modem will be perfectly adequate for most email traffic. However, if you get much email with large attachments, a faster connection is maybe worth considering. So, your hardware costs will be negligible. You'll also need a mail system that supports internet mail. A good, ubiquitous example of such a system is good old MS Mail, which offers basic email services and is supplied free with both Windows 95 and Windows 3.1x. It's possible to configure MS Mail to initiate a connection to your internet service provider via the modem at regular intervals, say every hour or so, to deliver new outgoing emails and to receive new incoming messages. To do this you simply add the



optional "Internet Mail" service to the Exchange Inbox client in Windows 95.

Such a setup is just dandy for standalone machines collecting their own personal email but it can't handle multiple internet email addresses on the network. What MS Mail needs is a bolt-on external mail package, one that can cope with POP3 (Post Office Protocol 3) and SMTP (Simple Mail Transport Protocol) mail systems offered by most ISPs. With such an add-on, every time MS Mail connects with the ISP's mail server, it downloads everybody's mail in one lump and then sorts it, placing the appropriate messages in the appropriate mailboxes. The result is transparency between internal and external email.

There are a number of these add-ons on the market. The European Microsoft Windows NT Academic Centre (EMWAC) based at Edinburgh University has developed EMWAC Internet Mail Services for Windows NT (along with a whole slew of other useful internet goodies). IMS is a suite of server programs which lets you use Windows NT as a mail server for internet mail. IMS isn't perfect — it requires Windows NT, of course, and can be a bit daunting to set up, but it does have the redeeming feature of being freeware. All the EMWAC goodies can be found at emwac.ed.ac.uk/.

Another alternative worth investigating is SLMail, developed on Bill's doorstep by Seattle Labs. This is available for all the Windows platforms, and a Windows 95 version (limited to six accounts) is available free from www.seattlelab.com/ (and is also

This undocumented goodie is supplied with Win95 and displays your PC's IP configuration, useful if you use DHCP on the server to allocate IP addresses

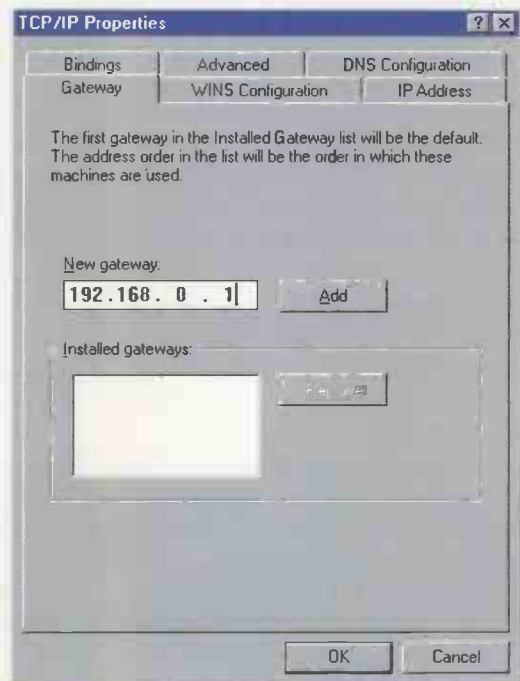
on this month's cover CD). Like IMS, SLMail95 offers a complete implementation of the Internet SMTP and POP3. With SLMail installed, your PC can function as a post office for popular internet mail clients such as FreeAgent, Pegasus, Eudora, Navigator and MS Mail/Exchange (with the Internet Mail add-on). The full-blown Windows 95 version costs \$189; the Windows NT version costs \$325. So, the software cost needn't be great either.

So we've now got our internet mail software in place but there's still one variable to determine — does your existing email account with your internet service provider permit multiple email addresses? The type of email account varies from ISP to ISP. Some, for example, allow up to 99 mailboxes from the one common-or-garden "tenner a month" account. This is certainly a cheap and cheerful solution but the principal drawback is cosmetic, the lack of a personalised email address — it would be, say, rgann@company.demon.co.uk rather than the more impressive rgann@company.co.uk. Private domains cost extra of course, and you'll have to talk to your service provider about what types of account it has on offer and proceed from there.

In terms of hardware configuration, a network email system will be similar to a normal standalone internet connection: you'll just need a phone line and a fast modem. Commissioning the connection would be much the same too. Note that as only the server accesses the internet, it will be the only machine on the network that needs to run TCP/IP. The workstations would continue to collect their email in the usual way, via NetBEUI or IPX. This makes life much easier for the network administrator and also prevents the workstations from accessing the internet during connections.

Full internet connectivity

In some ways granting complete internet access to the network isn't much more complicated than setting up global email. Just two extra things are required — an IP address for each workstation (which will almost certainly require a "corporate"-style access account with your ISP) and rapid access to the internet. A permanent leased-line connection offers instant connection while a V.34 modem takes about 20 seconds to connect. The former is expensive and fast; the latter is cheap and slow. A popular compromise solution is offered by ISDN which offers the best of both worlds — a fast 64Kbps service (with the possibility of 128Kbps) with the economy of demand dialling, plus fast connections, typically just a few seconds, certainly a lot faster than the time taken by your browser to load! For occasional internet traffic, ISDN is very cost effective, offering the speed of conventional leased

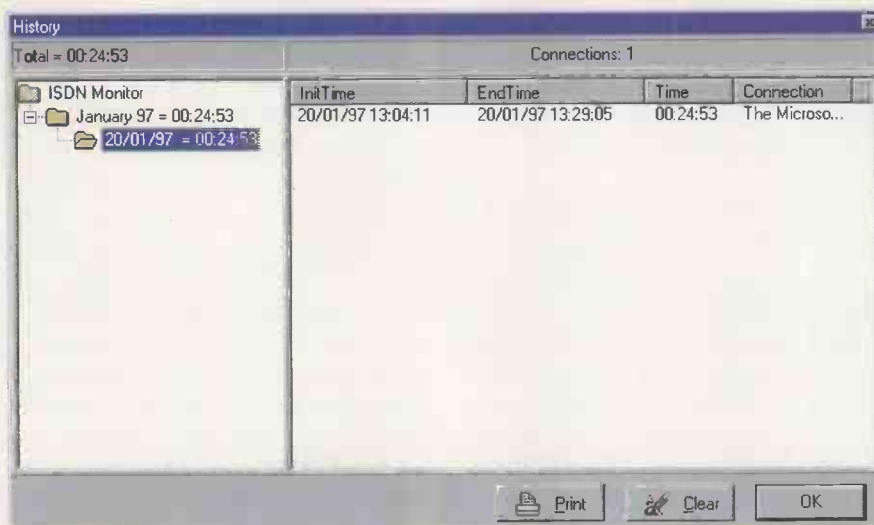


The ISDN router now becomes your gateway to the internet — so don't forget to add the IP address of the router to the Gateway tab of TCP/IP properties

lines at a fraction of the cost. However, once you spend more than about four hours per day online, a leased line becomes viable.

You would use an ISDN terminal adaptor or TA to connect a single PC to an ISDN but for networks you'd fit a single ISDN router instead. This device sits anywhere on the network, watching the TCP/IP traffic that

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Keeping a tight control on ISDN line charges is crucial. This little utility, ISDN Monitor, specifically monitors ISDN usage. It's on the cover disk!

passes by. It ignores traffic destined for IP addresses on the internal network but as soon as it detects a network packet aimed at an external internet address, it initiates a call to the ISP and sets up an internet connection. The line is dropped when the connection is no longer required or times out after a specified period of inactivity.

Users are spoiled for choice when it comes to ISDN routers, although you shouldn't necessarily buy the cheapest. Prices vary from about £750 to £1,500, which may sound dear but don't forget to divide the price by the number of users to get the cost into perspective. How do you go about choosing these exotic bits of kit?

ISP at your service

A good place to start is your local friendly internet service provider — what routers do they recommend or support? For example, many ISPs use Ascend routers at their end and so to simplify things they naturally recommend that you use something like an Ascend Pipeline 25 or 50 at yours. However, there are other equally good if not better alternatives, for example the £1,415 Gandalf XpressConnect LANLine 5250I or the excellent £750 Shiva AccessPort. If at all possible choose one that has an analogue phone socket (or two) — this lets you use the ISDN line as a normal phone line for fax machines or ordinary modems, for example.

Connecting an ISDN router to the network is the easy bit: you just plug the ISDN lead into the ISDN phone socket and plug in the network cable. Beware — this is usually a 10Base-T RJ45 which is the same as the ISDN (or "WAN" socket), so don't get

these two mixed up. Routers tend to be disarmingly small boxes, no larger than a modem, and so can often be tucked away in a comms cabinet or next to the server.

Configuring an ISDN router is a different matter and can be a particularly daunting task. They come with a range of tweakable settings wide enough to make any network techie jump for joy. However, if you've cut your internet teeth by manually setting up a connection using, say, Windows 95 Dial-Up Networking, you'll already be halfway up the learning curve. Even communicating with the router can be painful. Once configured, most routers let you telnet in to them for management and configuration tasks, but not usually the first time around.

Most routers therefore typically feature a serial port which lets you hook up a dumb terminal or a PC running a terminal program which lets you access the router's text-based configuration menu. One router I installed wouldn't even talk to good old Windows Terminal: I had to download ye olde Procomm Plus for DOS, circa 1987AD, before it could be configured. Luckily, some routers are a bit easier to configure — the Digi Retoura ST has an LCD control panel and keypad for direct configuration, while the latest Ascend Pipelines have Java applet-based configuration firmware, making them configurable from a browser. Most user-friendly of all is probably the Windows-based Shiva Monitor software supplied with the AccessPort.

Once connected to your router you'll need to enter such crucial details as the ISDN number it has to dial, the IP address of the router or gateway at the other end,

the IP address of this router, the DNS IP address, logins, passwords and security levels. This is just a basic list of data you can enter; more sophisticated users will want to configure things like the PAP and CHAP security protocols, data compression and bandwidth on demand.

Checking that the installation works is fairly straightforward and most include comprehensive diagnostics in the firmware as standard. Once the installation has passed this test you can use conventional internet tools, such as ping or even a web browser, to make sure that calls are being initiated and terminated as required.

The final step is to roll out TCP/IP to the workstations, a relatively easy task if you're using Windows 95, less so if you're still using Windows 3.1x. Your internet service provider will have allocated you a range of IP addresses, say 192.168.0.1 to 192.168.0.25, and you then manually dole out one of these IP addresses to each workstation. This tedious chore can be greatly simplified if you're running Windows NT on the server, as you can install the DHCP (Dynamic Host Configuration Protocol) service. This lets you define a pool of IP addresses that are then dynamically allocated to each workstation as they log on to the network. So instead of specifying a "static" IP address for each workstation, you'd obtain the IP address automatically from the server.

Silence is expensive

A final word of warning: ISDN is completely different to the usual PSTN phone system we hook our modem up to, and it's easy to rack up excessive ISDN phone bills unless you keep a close eye on it. The main problem is ISDN's inscrutable "silence": the absence of the usual audible clues such as dial tones and negotiation whistles and noise means you're entirely dependent on software to tell you if the line is up and data is flowing correctly, which is a scary prospect. If you don't want phone bills that resemble telephone numbers (ho-ho, weak joke) it's essential to get BT to supply you with completely itemised bills for your ISDN line so you can see exactly what your router gets up to when you're not looking.

PCW Contact

Roger Gann can be contacted by post c/o PCW at the usual address, or via email at hardware@pcw.vnu.co.uk

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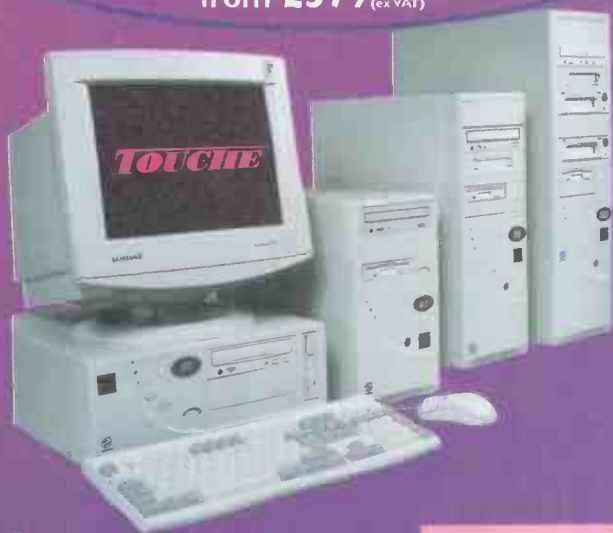
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World in motion

It's a funny old world — or at least, it looks very different in 3D than the picture-book 2D views we're familiar with. Benjamin Woolley sets his sights on a more accurate projection.

The picture we have of the world is one that is fundamentally distorted because it is a two-dimensional version of a three-dimensional surface. If you look, for example, at the standard map of the world, the so-called "Mercator Projection", China appears to be roughly the same size as Greenland when in fact it is four times larger. This distortion occurs because the land nearer the poles is stretched out to the width of the equator (to form the rectangular shape of the map), so countries on the equator appear narrower than they should when compared to those closer to the poles. You can see how this happens in Figs 1 & 2. Fig 1 shows a map of the world. Note how huge Greenland is compared to China. Fig 2 shows the same map wrapped round a sphere, with Greenland now assuming its proper proportions. (I created the globe using Fractal Design's new Detailer package, of which more later.)

There have been various attempts to produce more accurate projections (one of the best is said to be the Peters Projection, which makes Africa and other equatorial landmasses look huge, and more polar places, like our sceptred isle, teeny — you can have a look for yourself by browsing www.webcom.com/~bright/table.html), but none of them can be perfect. In the transition from 3D to 2D, something has to go, and in this case it is the true size and shape of each country.

As I have discovered from my email inbox, such problems are not confined to geography. A number of people have

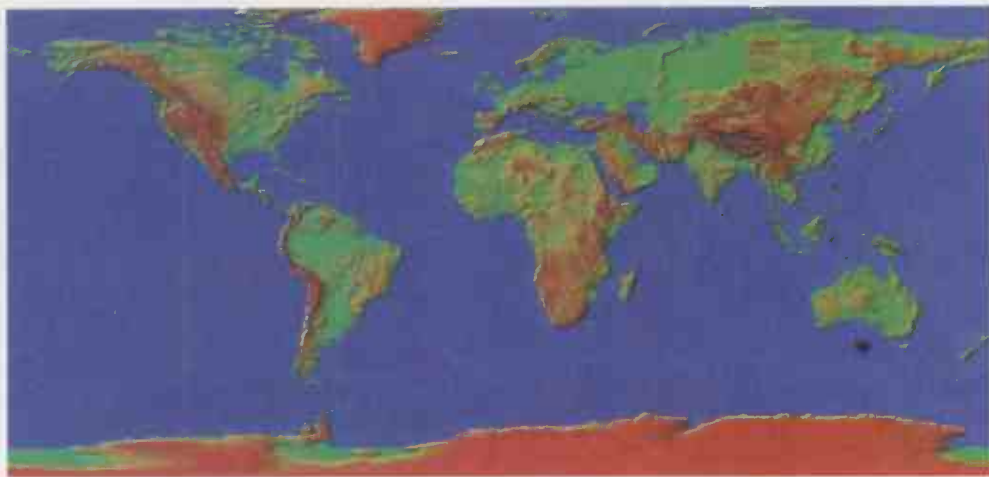


Fig 1 A texture map of the world. Note Greenland's size relative to China

described the problems they have encountered trying get their texture maps to work, so I thought this month I would concentrate on this most perplexing area of 3D artistry, and at one tool that claims to make it easier.

Generally speaking, when you are trying to create a 3D scene, the sort of project you are dealing with is the reverse of Mercator's: you are trying to turn a 2D image into a 3D one, to take your flat map and wrap it round a sphere or, more usually, an irregular, complex shape. If you take another look at Fig 2, you can see quite clearly one of the first problems you encounter when trying to do this. Greenland's shoreline is slightly fuzzy, and there are two reasons for this. The first has to do with the size of the map: it has fewer pixels in it than there are on the surface of the object as seen from this perspective and at this size. You encounter this problem regularly, most obviously when the 2D bitmap, the texture, is placed on a wall or floor receding into the distance. As you can see in Fig 3, the bitmap is blurry at

the point where the wall comes closest to the point of view. The solution to this problem is to match the texture's resolution to the wall's at the point closest to the camera. This means actually working out how many pixels there are down the edge of the wall, and making the appropriate edge of the bitmap the same number of pixels in size (in this case the bitmap is tiled, so I can divide the number of pixels in the rendered scene by the number of repetitions of the texture across the height of the wall).

The second reason for Greenland's blurriness is that where the map is approaching the poles, it is getting progressively scrunched up. There is no way of completely overcoming this problem unless you somehow manage to create a bitmap with progressively lower resolution towards the top and the bottom of the image. As far as I know, no image file format supports such variable resolution.

How, then, can you keep such distractions — "artefacts", as they are

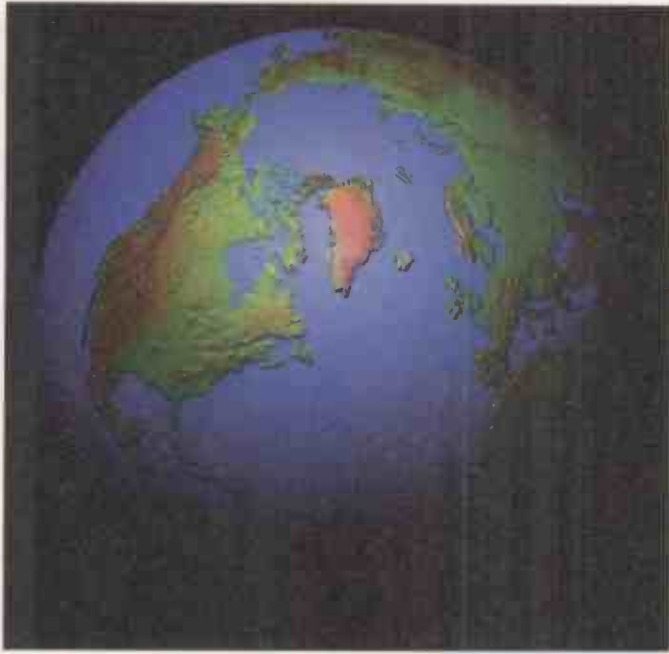
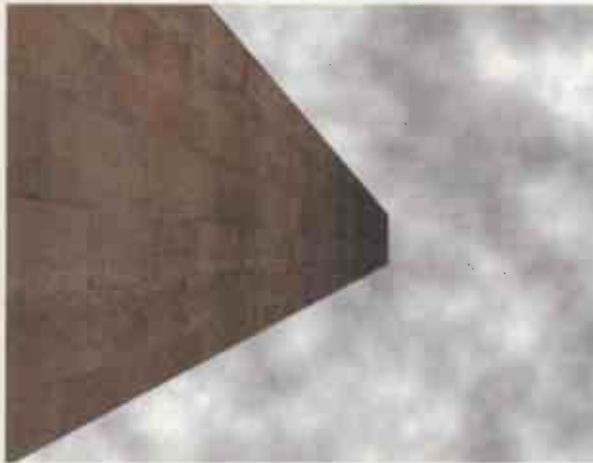


Fig 2 The texture map in Fig 1 wrapped round a sphere. Greenland assumes its proper proportions

Fig 3 The purpose of this rather surreal image is to show a texture map being stretched beyond its resolution. Note the blurring where the wall is closest to our point of view

called in the business — to a minimum? By getting a grip on the way your 3D package projects or “maps” the texture onto the object. In all 3D packages there are basically three ways of mapping, usually known as spherical, planar and cylindrical. Spherical mapping is the sort demonstrated with the map of the world. Planar projects the texture onto the object as a film image is projected onto a screen. Cylindrical winds the image around an object like a label round a tin of beans. You can generally use these methods to texture simple objects: a vase, for example, can be textured using cylindrical mapping, especially if you use a paint program to stretch and contract the image to correspond with the vase’s curves. However, some objects are just too complex to be textured using projected mapping, which means having to resort to a fourth method, surface mapping. A surface map is generated when the object is actually constructed, and if you think of the object as having a skin, the shape of the map is the shape of that skin carefully peeled off and laid flat.

If you are having problems getting a surface map to work, a weirdly distributed surface map could well be the cause. One way of solving it is to create a texture covered with a grid, using a gradation of colours so you can distinguish the position of the lines. Apply this grid as a surface-mapped texture to the object and see if that throws any light on how the map is arranged. Another easier solution is, of course, being able to paint and stick textures directly onto the surface of objects



without bothering about technicalities like mapping co-ordinates. Which brings me on to Fractal Design’s Detailer.

Detailer

When I first read the blurb about Detailer, I could barely believe it. “Amazing 3D Paint Program” proclaimed the press release. “A stunning new graphics application that allows users to paint on the surface of 3D models in real time.” This could be the answer to all my prayers, I thought; 3D painting on the PC platform.

After spending a few weeks with Detailer, I have to say that it only partially lives up to its promise. It can work in real time, but most PCs will be stretched to the limit to keep up. And the design is fussy, introducing a whole new set of terms and concepts to a field already overburdened with both. However, I should point out that even if it is not quite 3D painting in the full-blown sense, it does offer one crucial new

capability: it brings 2D and 3D together.

Generally, when I am working with textures, I have a paint package like Photoshop and a 3D package open on the system simultaneously. I edit the image, save it, load it into the 3D package’s texture editor, apply it and then render the object to see what has happened. When, as is inevitably the case, I find the texture is too big, too small, too bright, too dark, too whatever, I have to start again. With Detailer, these two functions are combined. You have one window showing the 3D model being textured, another showing the 2D texture. When you change the texture, you see the result immediately in the model window. And there is another facility that helps deal with the surface mapping problem: being able to overlay a “mesh” that shows in 2D the surface (“implicit” in

Detailer parlance) map of the object being worked upon — the skin, if you will. You can then paint over the mesh, building up a texture that maps directly onto the surface of the object.

Fractal Design is an interesting and increasingly influential company in the graphics field. Painter 4, Ray Dream Designer, Poseur, and now Expression (my favourite: a program that

allows you to use drawing tools to paint) make up a more than adequate toolkit for the budding computer graphics artist. Detailer will be a perfect complement to this developing suite once certain shortcomings are dealt with: when there is some sort of mechanism for importing surface/implicit mappings or, even better, deriving them from the geometry; when the interface and jargon is simplified; when you can export the flattened-out meshes of objects with implicit mapping so you can use more sophisticated 2D packages to paint over them. I hope this is not unreasonable. I only suggest it because Detailer so tantalisingly holds out the prospect of making texturing a simple, even intuitive process.

PCW Contact

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Retouch and go

Gordon Laing shows how to save what might have been the perfect photo, ruined by blots on the landscape: don't bin it, scan it, and use every trick in the book to total unwanted tourists.

This month, I finally get to bore you with my holiday snaps, thinly disguised as a feature on the tricks and morals of photo-retouching.

But first, the news. Intel's Pentiums with MMX enhancements have finally been announced, so in last month's *PCW* we tested eight MMX PCs. We tried out Adobe Photoshop 4 and CorelDraw 7, both featuring MMX code, on a Pentium 200MHz with MMX. We timed filters, image rotations and colour-mode changes under Photoshop and a screen redraw of Corel's Snowbarn file at a resolution of 1024 x 768 in 16-bit colour. We then swapped the MMX chip for a standard 200MHz Pentium without MMX, and repeated the tests.

The Photoshop results showed speed increases of up to 45 percent, but Corel's faster redraw was thanks mostly to MMX's doubled Level-1 cache. Slightly disappointed, we later discovered that the graphics-card drivers will have to be updated to make use of MMX chips, and only then will we see redraw improvements.

Those wanting a top-of-the-range PC

today, particularly for multimedia applications, should go for an MMX model. But the rest of us should be content to wait until we're running mostly 32-bit apps under NT4, then make the more significant upgrade to a Pentium Pro chip — soon to be seen with MMX enhancements too.

Anyone seeking a major hardware upgrade for graphics work should still consider more RAM before plumping for a faster chip. The photo-retouching I describe here involved working on 28Mb files, using a PC fitted with 32Mb. By the time Windows 95 and Photoshop had their share, the system almost ground to a halt. After one very slow day, I took 32Mb of RAM from my home PC to boost my work PC to 64Mb. The difference was amazing, with operations taking mere seconds rather than minutes.

As my main subject this month involves photography, this is a good time to mention digital cameras. Users of Casio's popular, but slightly toy-like, QV-10a and QV-100 cameras may be interested in considering third-party lenses. The Kerridge Computer Company offers a kit for either camera,

featuring a 1.5X telephoto and 0.65X wide-angle lens for £64 (plus VAT). A 2X and 4X macro lens kit is also available for the QV-10a at £64 (plus VAT), while a 2X-only macro lens for the QV-100 costs £49.50 (plus VAT).

Kerridge also offers a lighted base and stand, to photograph transparencies with the aid of the optional macro lens. We haven't yet had the opportunity to test these products but those still making their choice of digital camera could do worse than opt for Sony's new DSC-F1, reviewed in this month's *First Impressions* (page 70). It's a 640 x 480 pixel model with flash, LCD display, infra-red port and the kind of sexy styling at which Sony excels, for £595 (plus VAT).

The morals of manipulation

When I was 14, I stopped mucking around and started taking serious photos. I remember recoiling in horror when I first saw one of my photo pals use a filter: rendering the sky that graduated shade of tobacco so popular in those days. But now,



his picture would be inaccurate! The event had not been recorded properly and anyone looking at the picture would be falling for a lie!

Suffice it to say, this extreme response disappeared as soon as I had a go myself. Suddenly, photography had become much more than just finding something nice-looking, pointing the camera at it and clicking. It had finally dawned on me, the number of ways in which a photographer could manipulate a picture without even changing position or lenses. More to the point, it became much more fun.

Later, I found myself spending much longer in the darkroom than outside taking the pictures. Dodging and burning to bring out otherwise hidden details became an obsession. As regular readers will know, my darkroom now resides within my PC and applications like Photoshop, but the principles, goals and morals still remain.

A touch of professionalism

Digitally painting out dirt and scratches can be seen by all as beneficial. You can selectively darken, lighten or even recolour areas of a picture, even though some may consider this to be cheating a bit. Take a one-off trip to a far-off land, for instance: an otherwise perfect photo could have been marred by an overcast sky. Many would consider themselves fairly beaten. But while there's nothing better than capturing the perfect shot, first time, there's still no need to bin a less-than-ideal pic. Why not scan it in and add a blue sky? Or at least darken the area to bring out more detail in the highlights? You may at first share the same horror I experienced when witnessing my first filter, but if you can get over this you'll never look back (the professionals use every trick in the book until they get the picture they want).

This neatly brings me to the biggest graphics job I've ever completed: printing a collection of holiday photos taken during the past two years. Wanting the very best final results, I chose to use professional slide film: Fuji Velvia (50 ASA) and Fuji Provia (100 ASA). Choosing slide film, however, proved to be a bit of a mistake since the 10in x 8in prints I desired were going to cost over £10-a-go at professional labs. Besides, I had originally wanted 12in x 8in prints to show the full 35mm frame, but these had been even more expensive. Consequently, the processed slides just sat there in their sleeves... until now. Towards the end of last

year I decided to use my PC to scan the films and print them out the next time I got my hands on a decent colour printer. At the same time I could make any digital enhancements I desired.

Admittedly, I'm still not keen on the idea of selecting an overcast sky and replacing it with deep blue (the guilt still twinges, deep down). Nevertheless, I suddenly found myself to be not so bothered about man-made aberrations in my otherwise perfect field of view: those horrible signposts, telephone wires, fences, tracks, or even stray holidaymakers, could be easily wiped out using my PC.

Look — can you see the join?

Of course, you should still try to make life easy for yourself by trying to line up your shot to minimise the amount of post-processing work required. For instance, I once came across an extremely long fence crossing my entire field of view; I couldn't climb it, so instead I walked right up to it and pointed the camera along it. There's still a nasty fence to get rid of, but rather than crossing my entire frame, it only measures a couple of millimetres wide.

I also saw opportunities to digitally join two photos to produce a panoramic shot. Here, the usual tips apply; try to use a tripod, or lean on a fence to make sure the shots line up vertically. In one case I had to make do without a support and discovered later, at the joining stage, that the shots were about ten percent off so one of them needed an extra portion of sky. But after a little copying, pasting and smudging between the joins, I am pleased with the results I achieved.

Incidentally, there is an excellent tutorial on the CD that comes with Photoshop 4, which shows how to create a complex



Far left Utah's Monument Valley is just begging for a panoramic shot. I took two photos with my 35mm camera and stuck them together using layers in Photoshop 4 (above)

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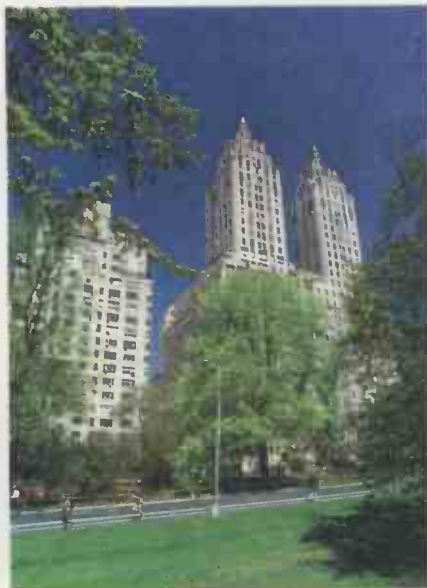
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Clockwise, from top left: Central Park with a lamppost, then without. My terrifyingly white legs... but hey, who are those two blokes by the rock? I'll get rid of them! Monument Valley by moonlight and a cunning car headlight trail; but perhaps it looks better without? A tranquil Californian beach scene... but hang on, spot that fella with the rucksack? He's history! All the above retouching was easily done with Adobe Photoshop's clone tool

panoramic shot, taking multiple frames and foreground parallax into account.

Before letting my photos and their captions do the talking, a short word on the PC hardware employed. I needed an excellent 35mm film scanner and was not let down by the superb Nikon Super CoolScan, a 2700dpi 36-bit model which quickly produced 28Mb (maximum) files. This was connected to an Adaptec 2940UW SCSI card, which also controlled a

secondary 2Gb Quantum SCSI hard disk.

The 166MHz Pentium PC I described earlier was fitted with 64Mb RAM. I used Photoshop 4 under Windows 95 and, to maximise performance, set Windows virtual memory to 2.5 times the amount of RAM for both minimum and maximum quantities, thus preventing Windows wasting time resizing its swap file. I also set Photoshop's scratch disk to the physically separate Quantum hard drive, independent from the

drive that Windows was using for its own virtual memory. I can't wait to go away on holiday again!

PCW Contacts

Any questions? Write to me at the usual PCW address or email me at graphics@pcw.vnu.co.uk

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Power Management

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Battery life

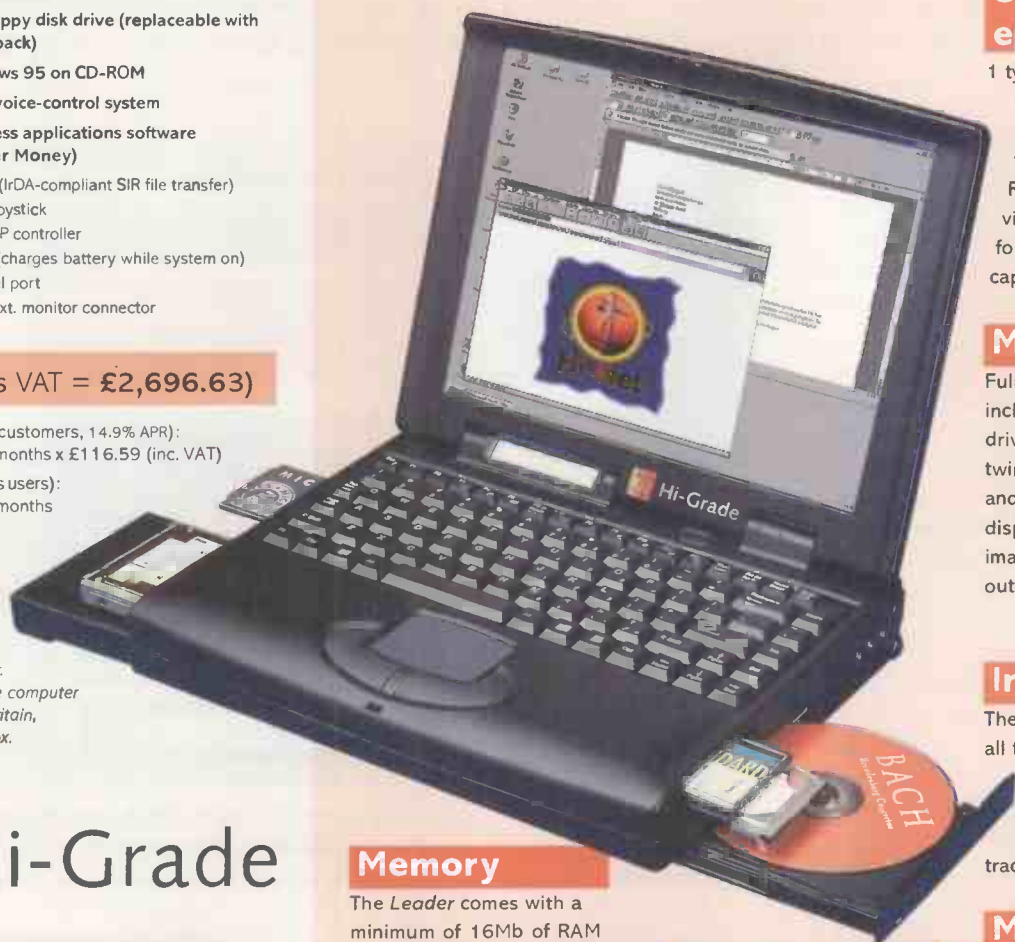
The Duracell battery gives 70 minutes' power before needing to be recharged. Battery life can be doubled by replacing the removable floppy disk drive with an optional extra Duracell pack.

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Generation X

Koan Pro, which randomly generates musical ideas, is now in Silver, Gold and Platinum formats and active on the internet. Steven Helstrip tuned in and turned on to its ambience.

From the letters and email I receive, it has become apparent that the occasional hardware review would be appreciated on these pages. So from on, I'll be on the look-out for new and appealing products to put to the test.

For this issue, I got my hands on the stunning ZA2 digital audio card from Zefiro Acoustics, which you, too, can lust after once you've checked it out. We also have news of an emerging audio standard for the internet, some useful MIDI tricks, the customary sampling CD review and a stack of goodies to enjoy on this month's CD.

Koan Pro

Last year I met up with Brian Eno to see how he was using Koan Pro to write generative, ambient music. Koan, which I wrote about in March 1996, randomly generates and develops musical ideas for up to nine hours at a time, and all from a modest 100Kb file. Eno later released an album of "Koan" music. It wasn't available on CD, however. It came on a floppy disk.

On the disk was a jukebox-style utility and enough music to last the weekend. Using only an AWE-32 as the sound source, there was only so much you could expect, but the music was interesting enough owing to the random nature of the Koan engine: each time a track was played, it would develop differently. In fact, you would never hear the same piece of music played twice.

Twelve months on, Koan has been adopted as a new, low-bandwidth music format for the internet. To help the format along, a new application has been developed to allow even the most modest of musicians to create generative music.

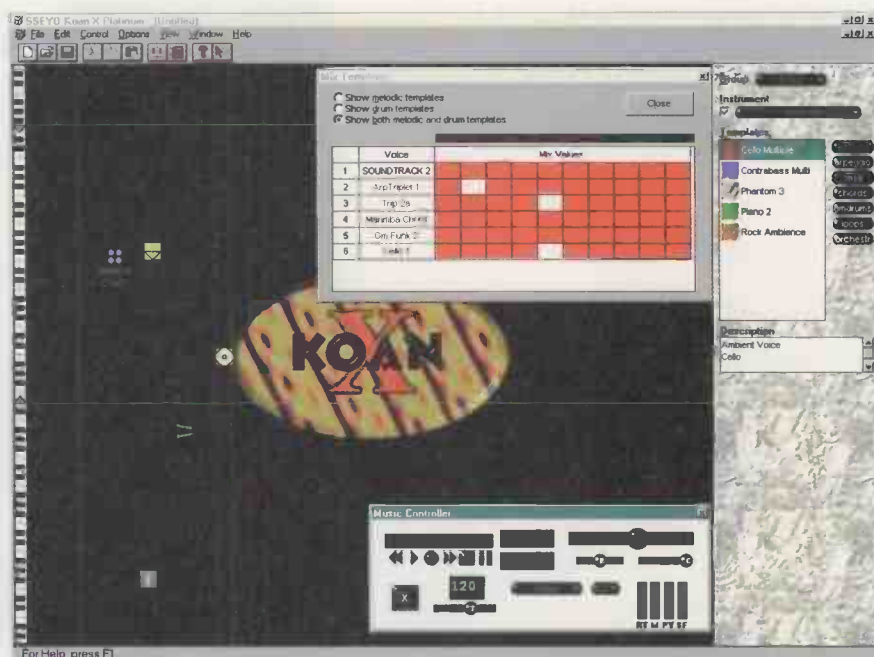


Fig 1 Koan X Platinum: Create "ever-changing" music easily by dragging pre-recorded phrases, or templates, into the mix window. Templates exist for most styles of music, from ambient through to techno. By applying rules to the templates, your music can take on a life of its own...

The new software, Koan X, comes in three flavours: Silver, Gold and Platinum. The Silver edition can be obtained as a free download from the sseyo web page and comes with 30 musical templates to be used as starting points for your arrangements. Although it's a radically cut-down version, it can be used to produce up to two minutes of music — ideal for creating free music for web sites. Gold provides 30 further templates, General MIDI and Soundfont support, and better editing facilities. It will generate up to eight hours of music. The Platinum version, shown in Fig 1, has it all: 100 templates, automated muting/mixing, and the ability to output songs to either MIDI or wav files.

You can find a copy of the Koan X Silver on this month's CD. Gold and Platinum versions are available from sseyo's website, www.sseyo.com, via secure credit-card transaction, priced £15.99 and £32.99 respectively.

Trigger happy

The only good to come out of studio noise was the invention of the gate. This is a hardware device, usually rackmounted, that turns the input signal from a noisy keyboard, say, to either on or off. When closed, no sound can pass through, reducing cumulative noise. When triggered by an audio signal, the gate reopens.

A neat feature found on some gates is



Fig 2 A typical gating rhythm, two semi-quavers followed by a quaver, seen as note lengths

the ability to open the gate from an external trigger, enabling you to create rhythmic patterns from any sound. This is a prominent feature in today's dance music, used frequently with synth pads and vocals. When a sustained chord is routed through a gate, a sound source from a second keyboard can be used as the gate trigger. By playing or sequencing a pattern on the trigger, some great effects can be created.

It is possible, using MIDI volume messages, to create a similar effect, although it cannot cure any problems you have with noise. A typical rhythm used for gating is two semi-quavers followed by a quaver, repeated over and over. This can be seen in Fig 2 as note lengths. Be aware, however, that note lengths should be reduced by 50 percent, to allow the gate time to open and close. If they are legato, the gate will remain open.

■ Newtronic gates

Newtronic has produced a compilation of 100 MIDI gating effects, along with panning and volume fade effects, available on floppy for £14.95 (Fig 3). The disc contains some excellent syncopated rhythms which are superb to have at hand. To use them, you import the MIDI file to your sequence and set the MIDI channel to where you want the effect. The panning effects, likewise, are not to difficult to program, but save you time and aggro.

Zefiro Acoustic ZA2

To record audio to your PC without adding noise in mountain-sized proportions, the

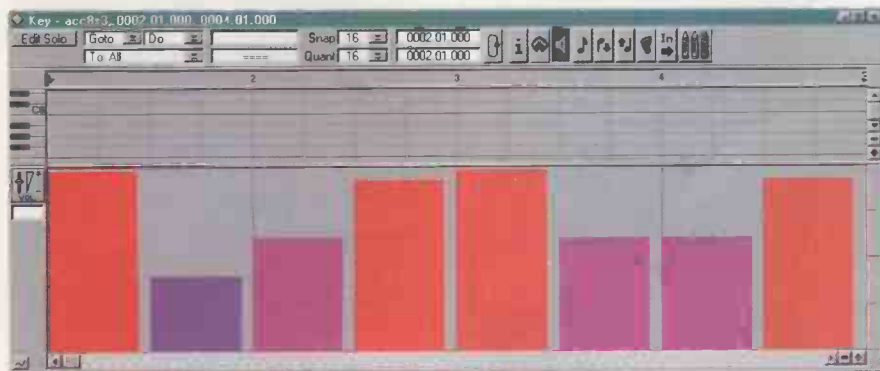
analogue to digital conversion must be performed by an external ADC, such as a DAT player. The ADCs found on sound cards just aren't up to the job, and even if they were, they would be subject to interference from the myriad goings-on inside your PC.

The Zefiro Acoustics ZA2 is a new DSP-based digital audio card designed to work alongside any digital source, be it a sampler, DAT machine or another hard-disk recording system. The single 16-bit ISA card provides SPDIF, Toslink fibre-optic and AES/EBU digital in/out as standard, and is supplied with DSP utilities to support 20-bit recording and MPEG2 playback. Providing your PC has two high DMA channels available, the ZA2 will work in duplex mode and has no problem handling as many audio tracks that your PC can throw at it.

Installing the card was straightforward, even with two other sound cards present. The accompanying driver software, seen in Fig 4 (page 306), can be accessed effortlessly from the Task Bar: such a simple idea and it works a treat. The icon also indicates whether or not the card is synced to an incoming digital clock.

All digital outs on the ZA2 function simultaneously: inputs are software selectable. There's also an analogue output for monitoring. With some help from the DSP, the ZA2 will up or down sample data, enabling real-time sample conversion. For example, you can feed a 48kHz DAT stream to the card, but actually record at 44.1kHz. Likewise, you can play a mono, 11kHz, 8-bit sample from disc and output to DAT at the

Fig 3 Newtronic's collection of MIDI gating effects will help you get the rhythm right



p306 >



MusicTime is the most entertaining way to make music with your sound card or MIDI instrument. You can compose, play and learn music on your computer. MusicTime displays the actual notes you play from your computer's QWERTY keyboard or from a MIDI instrument. Watch as MusicTime instantly creates beautiful, publisher-quality sheet music right before your eyes. All this for just £99.95 inc VAT. Rated 94% by Keyboard Review. CD-ROM £99.95 version also available for £129.95.



ROLAND SC7

The Roland SC7 is a no-nonsense alternative for people who want a thoroughly professional sounding General MIDI synthesizer for playing and recording music. Most modern sound-cards offer poor quality WaveTable sounds. The SC7 sound module contains 192 different musical instrument sounds recreated with 16 bit quality, processed through breath-taking reverb to give you the "recording studio sound". It connects simply via the serial-port (cable included): No screw-drivers, no IRQ conflicts, no DMA problems. This incredible deal represents over 70% off Roland's RRP, stocks are strictly limited - first come, first served **£89**

BAND-IN-A-BOX 7.0

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YAMAHA MU10

The Yamaha DB50XG daughter-board took the market by storm, bringing the sounds of their professional synthesizers to PC desktops for a fraction of the cost. Its astonishing realistic sounds went light-years ahead of even today's wavetable cards. AND NOW, Yamaha release the MU-10 external sound-card! No more screw-drivers, no IRQ conflicts, no DMA problems, just connect to the serial-port (cable included) and install the software. This beats even the easiest plug-n-play cards. FOR SOFTWARE, Yamaha wouldn't settle for the stripped-down software often thrown in with lesser products, MU10 includes the CD-ROM version of Steinberg's brand-leading Cubasis (not Cubase Lite). Buy the MU10, and you won't need to shell out on extra software 2 weeks later! Also features micline audio inputs - route any sound through the MU10 effects! **£199.95** INC VAT no hiding!

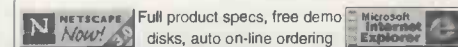
Discovering Keyboards

provides a well-rounded multimedia environment for music lovers ages 10 and up to learn basic music keyboard skills, the history of keyboards, and electronic sound technology. Includes the following modules: Keyboard Tour: leads users on a fascinating exploration of keyboard history. Extensively-researched information is highlighted by detailed graphics, video clips, and MIDI and digital audio examples for a true multimedia experience. Understanding MIDI & Synthesis: Interactive tutorials such as How Does a PC Make Music? Authoritative glossary with definitions for 100s of MIDI and synthesis-related terms. Keyboard Lessons: Provides an enjoyable method for learning to play piano. Introduces basic music notation, theory and playing technique with video clips exercises. With any MIDI keyboard connected to the PC, users can benefit from individualised analysis, feedback and progress tracking. Songbook: A virtual music library of MIDI songs such as classical, folk, holiday, patriotic and traditional favourites. Users can print the songs as sheet music. Game Room: 3 arcade-style games in the Game Room - Note Blaster, Rhythm Master and Music Quiz - test and improve users' note-reading skills, their ability to identify rhythmic patterns, and their knowledge of keyboard, MIDI and synthesis information. Discovering Keyboards CD-ROM is available now at just £79.95.

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Creative Essentials' World Class Breaks

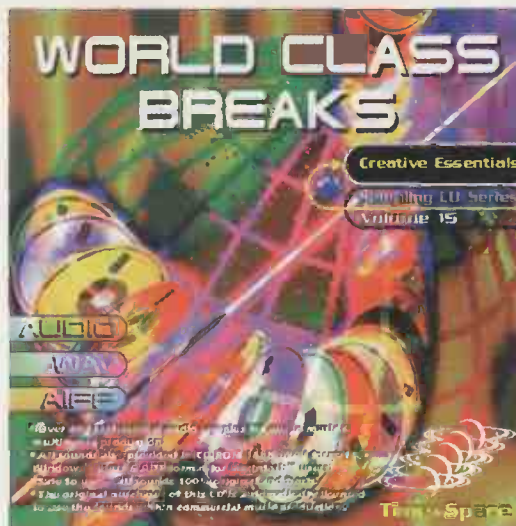
World Class Breaks is the fifteenth CD to be released under the Creative Essentials label. Like the rest in the series, a mere 20 quid buys you 200 samples, in this case drum loops in both audio and 16-bit sample format for Windows and Mac systems. Ten genres of dance music have been covered: hip hop, swing, acid jazz, house, garage, and jungle are among them.

For each of the ten styles there are twenty loops. These are essentially four grooves, with five variations on each, but this is no bad thing since it enables you to vary the drum patterns throughout your songs. Each of the four grooves within each style are tempo-grouped with 5bpm intervals.

John Dunne, the producer, seems to have hit the nail on the head with the swing, acid jazz and seventies funk patterns, but seems to have lost the plot with the house and garage patterns, which lack imagination and are stale in comparison.

Taking the overall package into account, though, this is still a great CD at a great price. The samples used to create the loops would have been appreciated, but isn't that the usual story?

There are five loops on this month's cover CD in the hands/sound folder. Have fun!

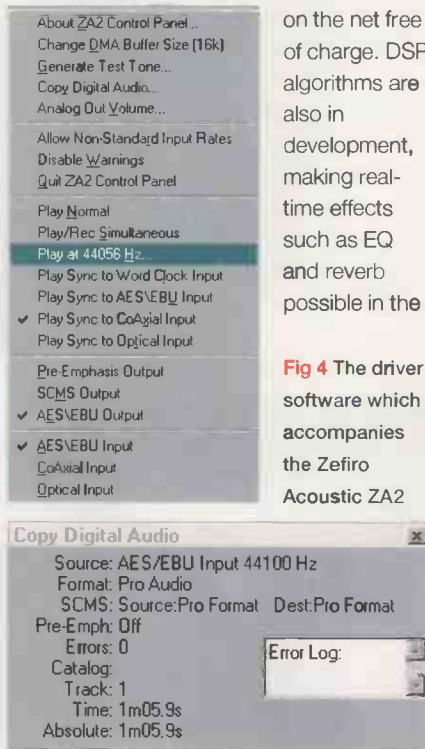


standard 44.1kHz 16-bit stereo.

The ZA2's OS is downloaded to the card at system boot, allowing the card to be upgraded with new software which will be

made available on the net free of charge. DSP algorithms are also in development, making real-time effects such as EQ and reverb possible in the

Fig 4 The driver software which accompanies the Zefiro Acoustic ZA2



near future. Hard-disk backup software is supplied with the card, enabling 1.2Gb to be stored on a standard two-hour DAT.

I've had two weeks to check this card out, and it's been a joy. I no longer need a digital patch bay, since I have had the DAT plumbed-in on the AES/EBU and the sampler on SP/DIF. I'm assured that multiple cards work together with Samplitude and SAW to provide up to six independent outs, although I don't suppose Zefiro would let me have another two cards to check it out...

Zefiro Acoustics has succeeded in putting together a truly versatile and future-proofed card at a superb price. It could show the CardD a thing or two.

PCW Contacts

If you have any hints or tips, MIDI-related items or general comments, contact **Steven Helstrip** at the usual PCW address or email him at sound@pcw.vnu.co.uk

Newtronic 0181 691 1087
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Zefiro Acoustics ZA2 £397 (inc. VAT) from RKMS 0115 961 1398; www.rkms.com



Clean-up campaign

Tim Anderson wrestles with the registry in an attempt to unscramble his settings, tries to get Access from Delphi, and plays Sherlock Holmes to detect which applications he has running.

Imagine you have paid a four-figure sum for a top-of-the-range client-server development system. One day you open up the development environment and the splash screen declares it to be the entry-level hobbyist version. Next, you open the application you are working on to be informed that you are not licensed to use some of its components. Sighing, you reinstall the product from CD but it does not fix the problem.

Sounds fun? This is exactly what can happen with Visual Basic 4.0. The reason, as you will have guessed, is that both VB itself and the many OCX controls which come with it depend on numerous registry settings. If the registry gets scrambled, this is the kind of thing that can happen.

The good news is that Microsoft's web site has a fix. Article Q149619 is entitled "Visual Basic displays incorrect splash screen", although the splash screen is the least of your problems. It is not such good news though. The official fix goes as follows:

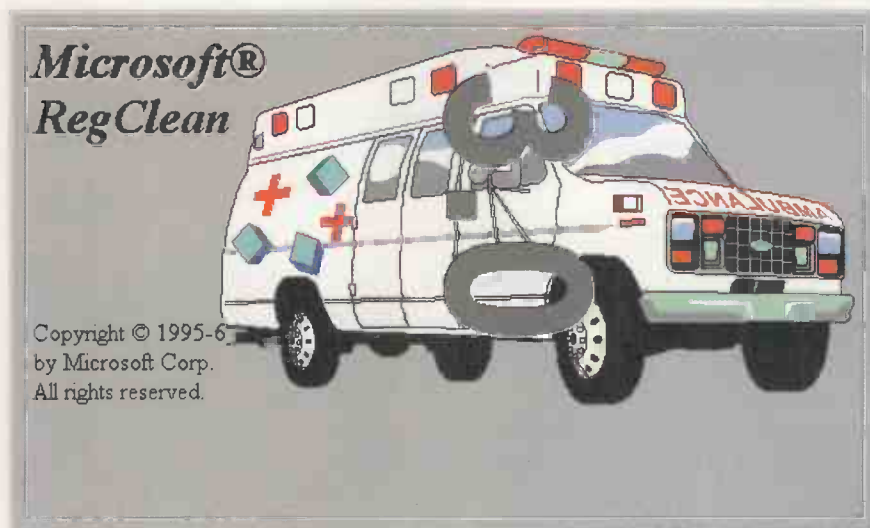
1. Using a registry editor, delete the HKEY_CLASSES_ROOT\LICENCES key.
2. Run Regclean.exe and delete all *.OCX and *.OCA files.
3. Delete OLEPRO32.DLL.
4. Restart Windows and reinstall Visual Basic.

Is this a good fix? Well, it's better than destroying your hard disk with a sledgehammer, but not much. As a developer, you will know that those .OCX and .OCA files represent most of the ActiveX controls on your system. An OCA file, by the way, is an OLE-type library created by VB when you first load an OCX. And ActiveX, says Microsoft, is becoming the foundation of Windows. Then there is

the license key to think about, which any number of applications may be using. A clue to the extent of this devastation is given in the note at the end of the fix. "Reinstall third party custom controls," it says, "and any software that may use the registry to store licensing information."

As for Regclean, a utility that comes with VB, I have come to mistrust it deeply. In a

An added twist is that the software industry now gives huge distribution to beta versions, via demonstration CDs and over the web. We are all encouraged to spend our time installing trial software, often laden with ActiveX elements, and probably fixed to stop working after a certain date. Frankly, the registry stands no chance of staying clean in these circumstances. Naturally, it is



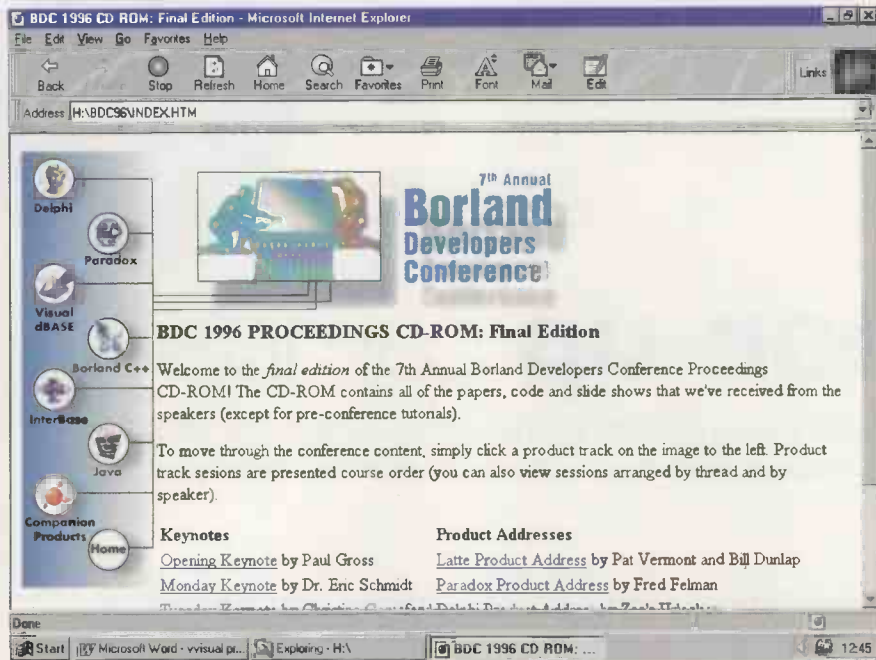
Microsoft's RegClean 3.0: proceed at your own risk

misguided moment I ran the latest version 3.0 which you can download from www.microsoft.com. The idea was to fix the annoying messages VB gives you when something is awry in the registry: "Object server not correctly registered". To my great amusement, the end result was worse. Post-Regclean, VB gave me this inspiring piece of technical information 148 times before it would open the Custom Controls dialog. At times like that, you reach for your registry backup with relief.

This problem is not going to go away.

not just developers who install all this stuff, but clients and users as well. Any application that uses standard Microsoft or third-party ActiveX controls or servers may find the ground sweetly removed from under its feet. In the meantime, here are my tips for avoiding registry hell:

1. Check your registry backup procedures.
2. Press Microsoft to come up with proper registry management tools, rather than these draconian "delete everything and reinstall" solutions.
3. Install beta software on a machine



dedicated to that purpose. Do not install it on a system used for real work.

4. Persuade your users to adopt the same policy.
5. So you only have one PC? Well, you have been warned.

Delphi

Borland's Conference CD

Borland developers who look with envy at the Microsoft Developer Network CDs, stuffed with documentation and tips, will be interested in the recently issued Developer Conference CD. At first glance it looks great, with technical papers and example code covering many real-world problems. The two most prominent products are Delphi and C++ 5.0. The catch is that what you get depends on whether individual speakers at the 1996 Borland conference bothered to send in their notes.

For example, an entry on "Client server development using Delphi and Oracle" leads to a detailed article with source code and a Powerpoint slide show, while another entitled "Rapid application with Delphi 2.0" brings up only a speaker biography. Everything is in HTML and no search program is provided, so you are left to use your own search tools. You also get a collection of patches, technical notes and demonstration versions. Overall there are plenty of good nuggets of information, but it is all rather a mish-mash and mostly available free from Borland's web site. A useful resource, but not for the price Borland is asking.

Mixing Delphi and Access

Guy Cartwright writes: "I'm led to believe that, using Borland's Database Engine, I can access data stored in a Microsoft Access database. I've followed the procedure in a book and created an alias called TstAccess, but I get the message 'Application is not enabled for use with this driver. Alias: TstAccess'. I've trawled the net for an answer but to no avail."

Borland's Developer Conference CD has some great resources, but why pay when you can visit the web site?

Thanks to the popularity of Microsoft Office Professional and Visual Basic, desktop data is frequently stored in Access MDB files. This creates a problem for other applications which need to get at the data, especially since Microsoft has never documented the structure of an MDB. In any case, the format changes with each new release of Access. Borland's Database Engine can only get at an MDB through ODBC, which is the method Guy has tried. Sadly, the BDE is not at its best with ODBC, and Microsoft's ODBC drivers for Access are nothing special either.

The situation is complicated by the inclusion of ODBC drivers with Microsoft Office, that are designed only to work with Office applications. This might well cause the error Guy is seeing. It is important to get hold of the separate ODBC desktop driver pack, for example from the Microsoft Developer Network CDs, but even then it might not work. It needs the right combination of DLLs, registry entries and even INI files to work as it should, and one or other can easily get corrupted. Sometimes the only solution is to remove

Fig 1 Routine written from the DAO COM interface

```
var
  sSql: string;
  dbEngine: Variant;
  db: Variant;
  snMembers: variant;

begin

  sSql := 'Select * from members order by surname;';
  dbEngine := CreateOleObject('DAO.DBEngine');
  db := dbEngine.OpenDatabase('C:\DATA\SPORTS.MDB');
  snMembers := db.OpenRecordSet(sSql, 4);
  {4 is dbOpenSnapshot}

  If not snMembers.EOF Then
  begin
    Edit1.text := snMembers.Fields['SURNAME'].Value;
  end;

  snMembers.close;
  db.close;

end;
```


Powers of detection

Once you get started with Windows programming, you soon find you need to communicate with other applications. At its simplest, for example, you might want to run the Windows calculator from a menu option in a VB application. Easily done with the Shell function but what if the Calculator is already running? In that case, you probably want to bring forward the existing instance rather than starting a new one. Here is how you can find out.

The key to detecting an application is to look for its main window. The API offers functions for listing or searching all the current windows. FindWindow takes two parameters, both null terminated strings. The first is a classname, the second the text of a window title. You can search for one or both and if it finds a matching top-level window, FindWindow returns the handle. For example:

```
hwnd = FindWindow(vbNullString, "Calculator")
```

If it returns 0, then Calculator is not running. Of course FindWindow must be declared, and you can copy the declaration from VB's API viewer.

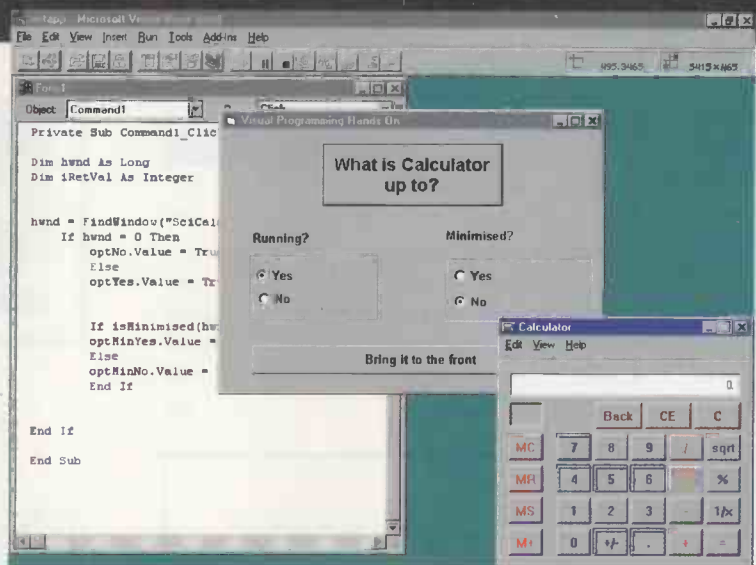
In the example above, FindWindow searched for the window title. This works fine with Calculator, although you could not be sure which calculator you were getting. It falls down with MDI applications, where a maximised document window adds its title to the main window. You might want to use the classname instead. It is not obvious what the right classname is, but there is another API function, GetClassName, which reveals all. Calculator turns out to have a classname of "SciCalc", while Word is "OpusApp". VB is "ThunderMain", and a VB application, "ThunderForm" or in version 4.0, "ThunderRTForm". Delphi applications get their classname from the name of the main application window, for example "TForm1". So the decision to look for a classname, a window title or both depends on which application you are trying to detect.

If the application is running, the next step is how to bring it forward. One possibility is the API function BringWindowToTop. For example, the following code detects Word and brings it forward if found:

```
hwnd = FindWindow("OpusApp", vbNullString)
If hwnd <> 0 Then
    BringWindowToTop (hwnd)
End if
```

The one time this will fail is if Word is running but minimised. A minimised window brought to the top is not much help. Time for another API function or two, in this case GetWindowPlacement and ShowWindow. Using the API viewer, add the declarations for the following:

```
GetWindowPlacement
ShowWindow
Type POINTAPI
Type RECT
Type WINDOWPLACEMENT
Public Const SW_SHOWMINIMIZED
```



Using API functions you can find out which other applications are running

```
Public Const SW_RESTORE
```

You can now discover whether a non-VB window is minimised like this:

```
Function isMinimised(hwnd) As Boolean
```

```
Dim lpWnd As WINDOWPLACEMENT
lpWnd.Length = 44 ' 22 in 16-bit Windows
Call GetWindowPlacement(hwnd, lpWnd)

If lpWnd.showCmd = SW_SHOWMINIMIZED Then
    isMinimised = True
Else
    isMinimised = False
End If
```

```
End Function
```

Now the function for bringing Word forward can be modified as follows:

```
hwnd = FindWindow("OpusApp", vbNullString)
If hwnd <> 0 Then
    If isMinimised(hwnd) Then
        iRetVal = ShowWindow(hwnd, SW_RESTORE)
    Else
        BringWindowToTop (hwnd)
    End if
End if
```

If you look up GetWindowPlacement and ShowWindow in an API reference, you will find numerous other fields and parameters that give you fine control over the results. One point to notice is that the length field of a WINDOWPLACEMENT type (or structure in C) must be set before it is passed as a parameter in GetWindowPlacement. Unfortunately VB has no SIZEOF function, so you cannot do this neatly. All you need to know for the moment is that in 16-bit Windows the magic number is 22, and in 32-bit Windows it is 44. Occasional inconveniences like this are the price you pay for avoiding the intricacies of C.

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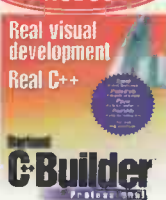


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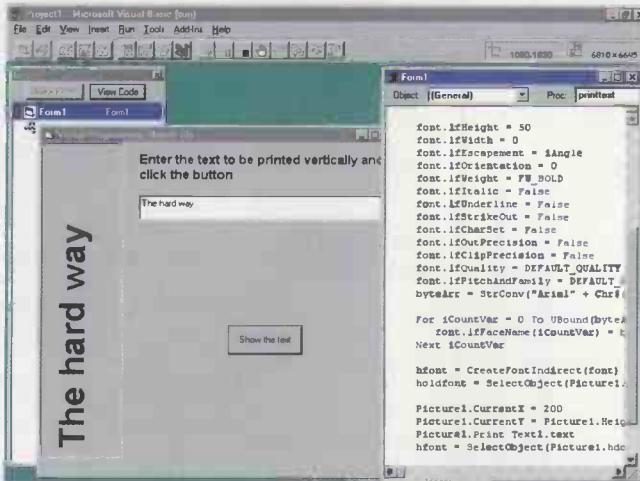
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PCW 0497



Left Vertical text the hard way, setting the font with the Windows API

both the ODBC driver and the BDE, weeding out any registry entries as well, and then to reinstall them both. Microsoft Query, which comes with Office, lets you test ODBC data sources by running queries against them.

There is another option if you are running Windows 95 or NT. Microsoft has created a COM interface to the JET database engine under the name Data Access Objects (DAO). It is documented and can be called from Delphi, and you can write routines like in Fig 1 (page 308). For this to work, DAO must be installed on the system, as it will be if you have Microsoft Office 95, for example.

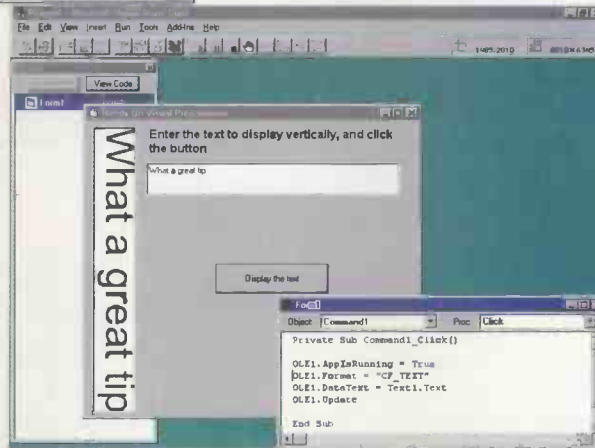
There are several other problems. Microsoft's documentation is aimed at users of Visual Basic or Visual C++, so you have to feel your way to some extent. None of Delphi's data-aware components will work. Finally, you cannot freely distribute the DAO files with a Delphi application. All but the last can be fixed by buying a third-party tool for using DAO with Delphi. Two well-known ones are Titan Access and Opus DirectAccess, while Nortech Software has a third in preparation. One of these is likely to be the smoothest route towards using Delphi with Access MDBs.

Visual Basic

Going vertical

Andy Smith asks: "How can I print vertical text in a Visual Basic application?"

There are a couple of easy solutions, and a better but more difficult one. The easy way is to use a paint program to rotate some text — Windows Paint or the shareware Paintshop Pro will do nicely — and paste it into an image control. You could even have several different messages and load them at runtime. For the best



Below Vertical text the easy way, using the OLE container and a WordArt object

performance, do not load them from disk but use invisible image controls, or the PicClip control, or the Imagelist control.

If you want to be able to specify any text you like at runtime, another possibility is to use the WordArt applet that comes with Microsoft Office or Publisher. Here's how:

1. Pop an OLE container onto a form and set it to contain a new WordArt 2.0 object.
2. Right-click the OLE container and choose Open. In the WordArt dialog, choose the text shape and font required.
3. Use code like this to update the text at runtime:

```
OLE1.AppIsRunning = True
OLE1.Format = "CF_TEXT"
OLE1.DataText = Text1.Text
OLE1.Update
```

The snags with the WordArt approach are firstly that you need the applet installed on the user's system, and secondly a little overhead thanks to OLE. If that rules it out, the heavy coder's method is to call the Windows API. Windows uses a structure called a LOGFONT to define font characteristics, including several properties not exposed by VB's Font properties. One of these is lfEscapement, which specifies the angle of the text. Assuming that the y

co-ordinates count from top to bottom, the lfEscapement field specifies the anti-clockwise angle in tenths of a degree. That means you can print diagonal text or even write a routine using a timer that would rotate text around a central point. To set a font using the API, take the following steps:

1. Declare the necessary API types, constants and functions.
2. Define the fields of a LOGFONT variable.
3. Create a logical font by calling CreateFontIndirect. This returns a handle to a font.
4. Select the font into a device context by calling SelectObject. For example, VB

Picture Boxes, Forms, and the Printer object all have hdc properties which give you a handle to the device context.

5. Print to the device context using VB's print method or API functions such as TextOut or DrawText.

6. Clean up by unselecting the font and calling DeleteObject with the font handle.

Minimal sample code for drawing vertical text in VB 4.0 is included on the

CD. Similar code works in VB 3.0 or 16-bit VB 4.0. It seems complex at first but it is the kind of code you can use again. Then again, alongside the four lines needed to automate WordArt, it does look like an argument for sticking to the easy way.

Cover CD

The MSDN starter edition for Visual Basic is on this month's cover-mounted CD-ROM. It includes 125Mb of searchable information on VB 3.0 and VB 4.0.

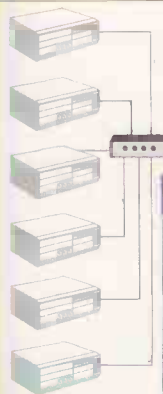
PCW Contacts

Tim Anderson welcomes your Visual Programming comments and tips. He can be contacted at the usual PCW address or at visual@pcw.vnu.co.uk

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Pigs might fly

Mark Baynes finds hardware to be a boar, as he tries to install SAPS on Pig: even putting the boot in doesn't work. He's just in time to catch the Netport Express for a quick review, though.

Ever since I took over Hands On Networks I have had problem after problem with the hardware on my network, in particular a certain server which I shall refer to as "Pig". I would like to refer to it as "**!****?* !*?*" but apparently I can't, and anyway, if my Mum read it she would be a bit upset.

You may recall, in last month's column, I mentioned that Chris Langford emailed me to ask exactly *how* I was going to share a modem on NT Server over my LAN, and I replied that I was going to review a product called SAPS which does just this thing. So there I was, software in hand, all ready to demonstrate the wonders of SAPS, when Pig failed to re-boot. It was not resting ... it was dead.

Now, this is not the first time I have had problems of this kind with Pig, so I knew it

was a hardware problem and gave it a good kick, and I do mean a literal *kick*, not a metaphorical one. You should never treat hardware with too much respect and should always let it know who is boss whenever you have the chance. It responded slightly to the kick but because I was up against a deadline I had to review an Intel Netport instead. This was also somewhat problematic (as recalled here).

The funny thing was, I had copied all the data files on Pig to my other server "Big Boy" only two days before, because I wanted to reconfigure it with both NT and NetWare. Lucky, huh? The reason I mention this is that if you believe your server is going to last a lifetime, dream on. Mine is from a well-known manufacturer but has been on the blink for 12 of the 24 months I have been using it. I am not revealing the name

of the server because, to be fair, it does receive a lot of abuse — apart from me kicking it. But when I do get it back together, Chris, I will definitely review SAPS — honest.

So there I was, all ready to review the Intel Netport Print Server (see page 315). I had the hardware installed, with a test page printed. I decided to install it under Windows 95 because NT Server was down, but I found that the Netport management software, running under Windows 95, couldn't see the Netport so I couldn't configure it.

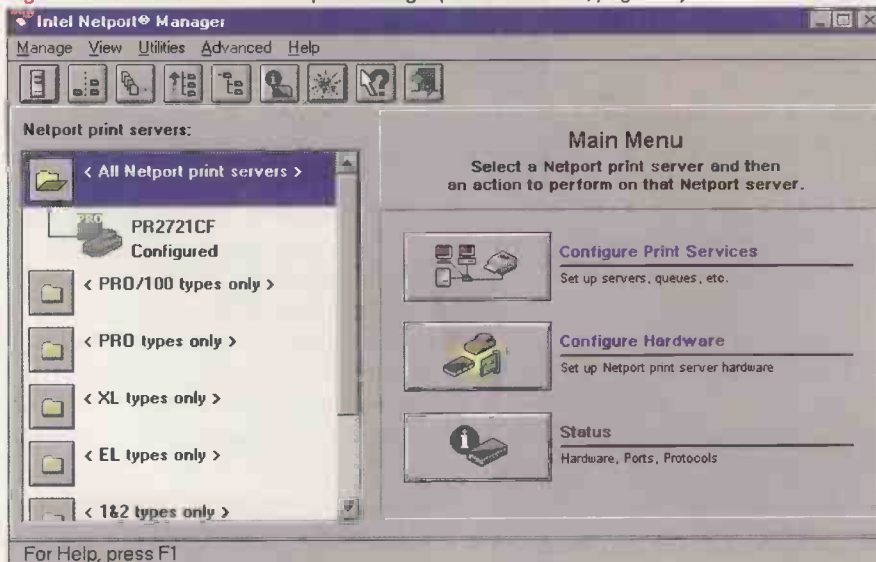
I turned it on and off several times and re-installed the software. I even read the Help file and realised that I needed NetBEUI installed. I re-booted but still got no joy, so I rang Intel tech support and spoke to two of their people for half an hour — very helpful but as baffled as I was — and then decided to attempt configuring from another workstation running Windows 95. Did this. Oops, same problem.

It seemed like a low-level protocol problem (it wasn't the physical media) and my instinct told me that the root of this problem was in Windows 95 itself, not with the Intel software. So I then installed the software onto another machine running NT Workstation 4.0: it instantly saw the Netport and allowed me to configure it.

I know I should really find out exactly what the problem was with Windows 95, but while my server may be a Pig, I also know that quite often, when networking, Windows 95 is a complete dog.

Next month: how to remove the impression of a size-ten boot from your server side panel.

Fig 1 The main screen of Intel Netport Manager (see mini-review, page 315)



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Mixed bag

A few words about correspondence: I am pleased to look at any queries you email me and find them very interesting, so please keep them coming. But I should point out that (a) due to lack of space I cannot print replies to them all, and (b) due to the lengthy process inherent in producing something the size of PCW, there is a significant delay between my receiving them and my reply appearing in this column, so don't wait for me to come up with a fix!

I will always tend towards answering the more generic questions as these are going to be of more use to more readers. And I will also favour those from individuals or those with limited backup support.

I received a query recently from someone working for a well-known IT consultant which charges hundreds of pounds a day for advice. I say to them: "Sorry, this column is for those of us who deal with little networks!"

OSI models and protocols

Q. "It was good to see coverage of the OSI model in your column but I think you should make a distinction between the model, which applies to almost all comms protocol stacks, and the OSI protocols, which have a small user base, particularly now that the IP suite has taken over the world.

"Your example of two developers in California and Peckham being able to co-operate using the OSI model to interface network widgets would only work if they were using OSI protocols throughout. In fact, there is so much room for interpretation that the widgets would most likely interwork only if they were following a specific OSI profile such as GOSIP. Such profiles are the closest thing to 'an OSI stack', but to use the 'OSI stack' is seriously misleading.

"On the software side, there is also no reason why developers A and B should use even remotely compatible APIs. This has been a major problem with OSI and required the invention of things like System V Release 3 Streams and other models for the software side of protocol stacks.

"The API deficiencies of OSI are another reason why IP has taken over. The latter has a straightforward sockets API rather than a plethora of higher level APIs, and allows selection of suitable presentation/session layer functionality, depending on the application.

"For example, OSF DCE RPC has a very

complex presentation layer function, while Telnet's is extremely simple, each being appropriate to the application domain."

richardd@cix.compulink.co.uk

A. Richard, thanks very much for your letter and for clearing this matter up. Any more questions about protocol stacks are coming directly your way!

Halfway house

Q. "I was interested to read in the February issue of PCW that you intend to connect four PCs together using 10-Base T and to attach further resources straight to the hub. I have a similar situation. I have a 10-Base T network of four PCs plus two printers, and I would like to achieve independence of the PCs and the printers. We run a variety of software: at various times a machine might be running any of OS/2, Windows 95, Windows NT Workstation or Windows 3.x.

"The peer-to-peer style of networking permits each user to share resources such as printers, and to allow other workstations access. For example, workstation A has a printer and workstation B may use the printer as an output device. I do not like this example because the printer is owned by workstation A. I would like the printer to be a network device in its own right, and available to both workstations A and B. In the server style of networking the printer is owned by the server. The server is running permanently and allows workstations access to the printer.

"I want a halfway house situation where the printer is not owned by any workstation or server. I want the printer to be an independent network device in its own right. Any workstation may send work to the printer whenever it wishes.

"There are many sources of standalone box which will allow a printer to become a network device. All I have identified are intended for use with a server operating system. The printer, although connected as a network device, effectively becomes a slave of one particular server.

"Do you know of any software, or hardware/software combination, which will allow the same printer to be addressed as a network device from multiple workstations, with no server involved? I don't expect you to identify a solution for all of the software environments — any of them would be a start!"

100121.77@CompuServe.COM

Mini-review — Intel Netport Express PRO/100 Print Server

I have been trying to get my hands on one of Intel's Print Servers for quite a while now. I have reviewed a few print servers and, to be quite honest, a couple of them have been extremely poorly made. The Intel is quite the opposite, however, and is designed to withstand wear and tear.

At the front of the unit are the three printer ports, two parallel ports and one serial port, and on the left-hand side is an RJ-45 socket for a length of 10BaseT. There are a couple of recessed DIP switches, a diagnostics button and the connector for the power

supply. The documentation is good, the first page of the Quick Start guide showing

Fig 2 (right) The Netport print server status

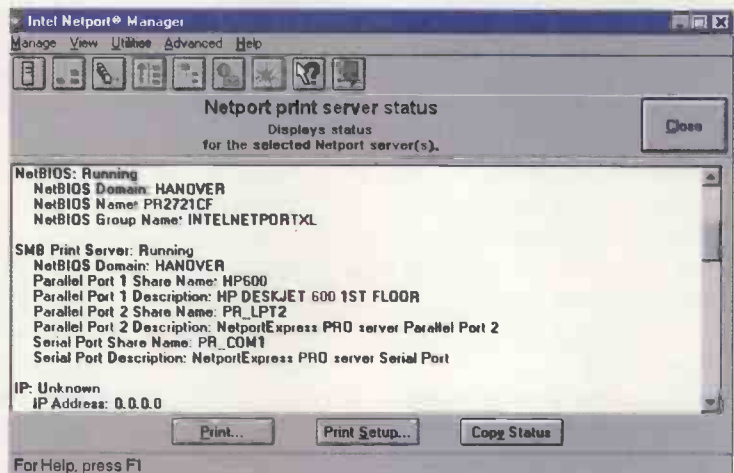
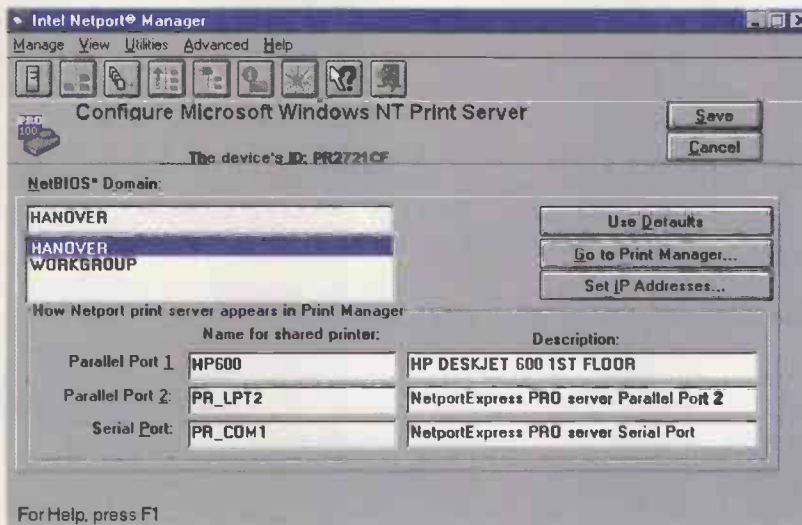


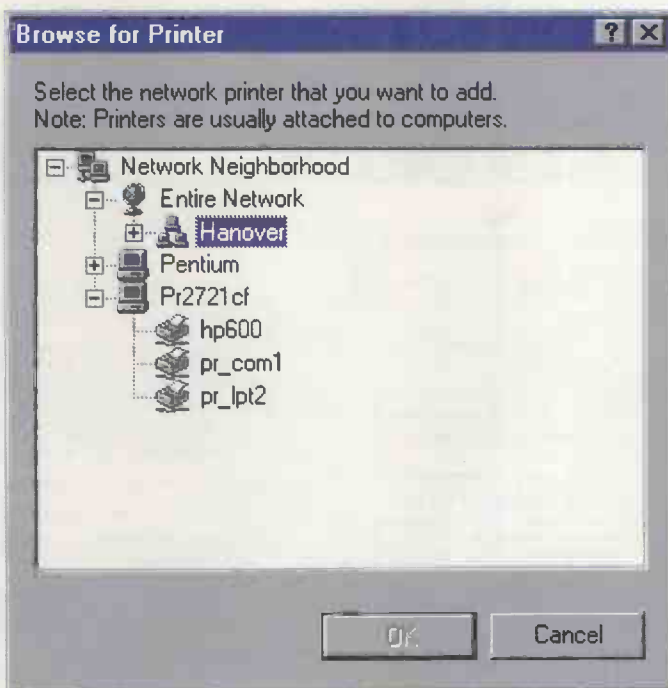
Fig 3 (right) Basic identification details of my DeskJet 600 attached to the Netport

Fig 4 (below) At last! The Netport seen as Pr2721cf under Windows 95



plugged a length of cable into the RJ-45 socket. It will auto-detect if your ethernet network is running at 10 or 100Mbps/sec. To test that all is well from a hardware point of view, you simply press the diagnostics button on the side of the Express and it should print a diagnostics report. Hardware setup time is three minutes.

I next installed the software. Network operating systems supported are Novell, NT, Windows 95, Windows for Workgroups,



how to connect your printer(s) to the network.

I plugged in the Netport Express and the Activity, Transmit and Receive lights on top of the unit began to flash. I connected the existing printer cable from my tried-and-tested HP DeskJet 600 into parallel port one on the Netport Express and

LAN Manager, IBM LAN Server and AppleTalk (Unix is also supported). I chose to install a 100MHz Pentium PC running Win95 and this is where my problems started — I could not get the Netport software (running under Win95) to see the Netport, but I eventually installed the software onto another PC running NT Workstation 4.0 and this went very smoothly indeed.

This is a nice, high-quality piece of hardware, but it's not cheap.

PCW Details

Price £468.82 (£399 ex VAT)
 Contact Intel 01793 431155
 Good Points High-quality, good management software but...
 Bad Points ...potential problems installing under Windows 95.
 Conclusion Handy piece of kit for the small-to-medium-sized ethernet network.

A. This is an interesting one! I have the feeling that what you are after does not exist, although I could be wrong.

In a peer-to-peer situation, a printer hangs off a specific PC which is, in fact, a print server for that PC dealing with the print queue. In a server-based LAN, the printer can hang off the server or, more likely, be an independent physical network device in its own right (see mini-review of Intel Netport Print Server, page 315) but — and it is a big "but" — the print queue has to be managed somewhere by the NOS. In a server LAN, this is going to be the NOS running on a server.

So your ideal of "a halfway house situation where the printer is not owned by any workstation or server" is not really possible because it has to be managed by something.

There goes the Neighbourhood

Q. "I have a 486 DX4 100 running Windows 95 and a Pentium 75 with NT W/S 4.0.

"Things ought to be going smoothly — after all, this sort of setup is Microsoft's dream, is it not? Well, unfortunately, the Windows 95 machine shows no computers in Network Neighbourhood — not even itself — even if the 'T-piece' on that machine has a terminator on both ends. The Entire Network icon exists but when attempting to open it I get the message: 'Unable to browse the network ... it is not accessible'.

"The NT machine allows browsing of the

network, but the other PC (the only other one on the network) does not show. I have toyed with the idea of a hardware fault, but I have tested everything I can think of and that appears not to be the case.

"I am a newcomer to networking and can't be sure all the settings on either machine are correct, but I am fairly confident. Any ideas? (The protocol I am using is TCP/IP, but I have also installed NetBEUI.)

"If I enable file/print sharing on the Win95 machine, it does appear in Network Neighbourhood although it takes a couple of minutes for this to happen, during which time it is still unable to browse the network."

alex@margo.demon.co.uk

A. It is nice to know that this happens to other people apart from me! Don't worry about being a networking novice: I have been doing this stuff for over five years now and I still often find that after zapping my PC's hard drive and carrying out a reinstall (which I do on a regular basis to clear out all the dregs of software I have reviewed), I still get this problem from time to time.

I cannot tell you definitely what the problem is but try this:

1. The first thing to do when you have any network connection problems is to check the physical media — do you know for certain that the network cable works properly? Can you borrow another one on a working system for a while and try it with that?
2. Are you certain that the network cards in

each machine work? If not, get their installation disks and run the self-test diagnostics. Then double-check to make sure there are no interrupt clashes; you can do this by looking in Settings/Control Panel/System.

3. Have you tried the Network troubleshooter in Windows 95 Help? This is quite good and has saved my bacon a couple of times.
4. Remove all your network software components and start again, but to start with try just running something simple like IPX or NetBEUI, before trying TCP/IP which is about as much fun to configure as putting your hand into a waste disposal unit and turning it on.
5. Have you tried Find Computer from either the Start menu or Windows Explorer? I have found in the past that although a computer will not show up in Network Neighbourhood you can "Find" it. Strange but true.
6. Zap both PCs and start again. It's a drastic measure but it often works. It depends how much software you have installed on them because some programs can, for no obvious reason, have side effects on others.

PCW Contact

Mark Baynes is a web developer and IT Journalist based in Brighton. He can be contacted by post at the usual PCW address, or via email at networks@pcw.vnu.co.uk

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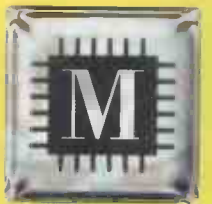
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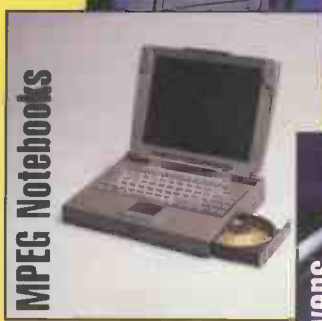
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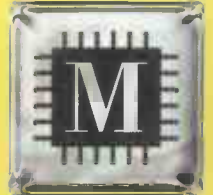
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NeXT on the agenda

Howard Oakley hopes that Apple will capitalise fully on its recent acquisition of NeXT, including giving priority attention to a new MacOS filing system. Plus, comms chaos.

In recent years Apple has been more adept at delivering shocks than surprises, so it's a particular pleasure, when all eyes seemed turned towards Be, that we should hear of Apple's purchase of NeXT. While I am sure that Apple has clear plans for its latest acquisition, I am certain that those plans will prove as flexible as Copland, although hopefully it will unravel to a tighter schedule.

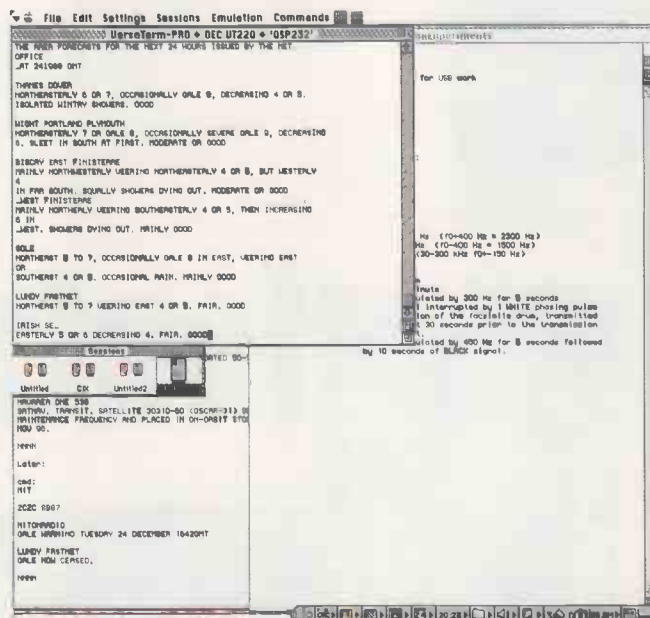
Whatever Apple does with NeXT, it seems sure that its combined products will be more exciting and that it will regain some of the initiative and leadership that has been on the wane. High on my wish list is a replacement filing system for MacOS, which will spare us having to patch up with Disk First Aid after each significant crash.

Just as Apple has managed to transform its implementation of Virtual Memory in System 7.5.5, so it should accord a high priority to the use of memory protection to minimise the consequence of crashes, too: that part of the Copland project (MacOS 8) also needs early introduction. And if the networking and security trappings which the NeXT team brings can turn a hybrid MacOS into a first-class operating system for corporates and the government sector, Apple's purchase will be money well spent.

Communication breakdown

Having cut my commercial programming teeth on a suite of applications to drive various bizarre devices through the Mac serial port, I tend to assume that ordinary communications can only be more simple.

If only this were so. This month's new hardware was not a conventional computer peripheral, but the ham radio equivalent of a modem (and more). AEA's DSP-232 is a peripheral of traditional and impressive

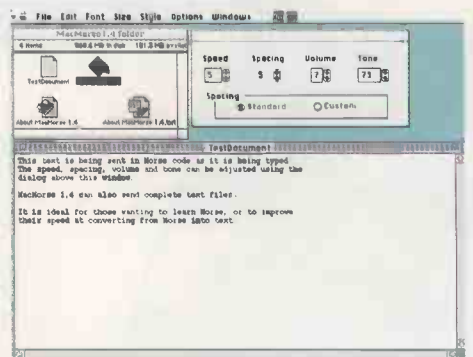


Left AEA's DSP-232 radio modem connected to VersaTerm Pro, showing a received Navtex weather forecast. An hour or so later the software crashed, leading to comms chaos

Below Although most amateur radio software seems to have been written for Windows or MSDOS, MacMorse's fine Morse tutor is an excellent learning tool

design: a black box with lots of flashing coloured lights, more convincing than a succession of faceless and unlit platinum peripherals. Instead of converting between digital data fit for the serial port and whistles down a phone line, the DSP-232 works with the far weirder sounds used in radio data transmission. These range from cicada chirruping to rhythmic grating, demanding far greater versatility in the electronics.

Rummaging through my confused knot of cables, I decided to use the 9-pin "D" (standard, newer PC serial port) to Mac 8-pin "DIN" (standard Mac serial port) cable provided with my new Olympus C-800L digital camera, connected to the 9-pin "D" to 9-pin "D" cable supplied with the DSP-232. With everything plumbed in, and the DSP-232 suitably fed with pops and crackles from an Icom R8500 communications receiver, I flashed up my



regular communications software, VersaTerm Pro. At this stage, my interest was in receiving and decoding Navtex messages which contain weather forecasts, navigational warnings and the other bread and butter of mariners. All you should need is a decent receiver, a DSP-232, and a plain text terminal program. But VersaTerm, having obliged dutifully for a couple of hours, suddenly froze the screen. I tried

What goes where in your System Folder?

The only enforced rigour on your Mac's hard disk is in the System Folder. If you want your Mac to work properly and benefit from the full features of all your applications, you must ensure that all files and folders within the System Folder are correctly named and at the right level in the hierarchy. Most software now comes with an intelligent Installer which puts each file in the appropriate place, but sometimes you will have to install things by hand. Your first recourse is to drop the file(s) onto the System Folder and allow it to sort out the proper location for each: mostly it works, but sometimes you will need to correct errors.

System Folder A-Z guide

- [f] Apple Menu Items: desk accessories, applications and aliases to be accessed via entries in the Apple menu.
- [f] Claris: if you have installed any Claris applications, contains dictionaries, the XTND file translator system, help files and other materials for those applications.
- [f] Clipboard: the last copied or cut item.
- [f] Control Panels: items accessible via the Control Panel menu, which may contain extension code.
- [f] Control Panels (Disabled): control panels which have been turned off using Extensions Manager.
- [f] Control Strip Modules: will be added to the Control Strip.
- [f] Desktop Printers: LaserWriter 8.4 and later printers shown on the desktop.

- [f] Extensions: a whole mass of extensions, communications tools, and shared libraries.
 - [f] Extensions (Disabled): extensions which have been turned off using Extensions Manager.
 - Finder: the Finder itself.
 - [f] Fonts: installed fonts and PostScript fonts.
 - Hosts: definitions for TCP/IP connections.
 - [f] Launcher Items: aliases which appear in the Launcher.
 - MacsBug: a low-level debugger which can help you cope with crashes.
 - [f] Preferences: settings and preference files and folders for applications, although a few older ones still place their files in the System Folder itself.
 - [f] PrintMonitor Documents: documents being printed in the background.
 - Scrapbook File: the contents of your Scrapbook (in the Apple menu).
 - [f] Shutdown Items: aliases etc. to be run automatically before shutting down.
 - [f] Startup Items: aliases etc. to be started when your Mac starts up.
 - System: the System file itself.
 - System Updates: additions to the System file.
 - [f] System Extensions (Disabled): older extensions normally littered around in the System Folder itself, when turned off with Extensions Manager.
 - [f] Application-specific folders and files.
- Note: [f] indicates that the item is a folder; others are files — see Fig 1 for icons.*

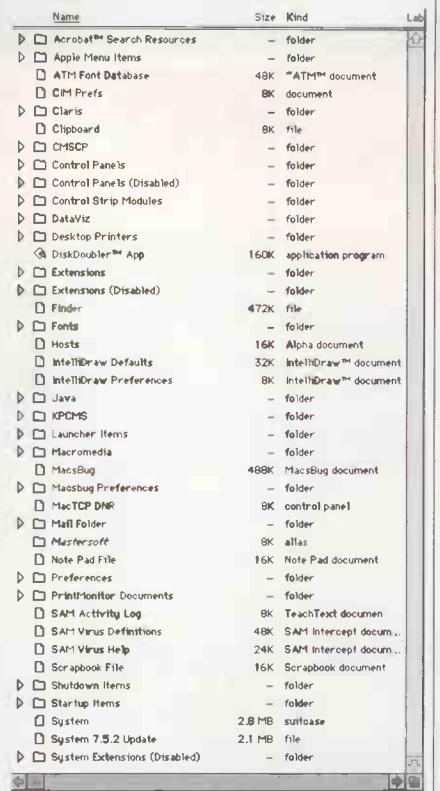
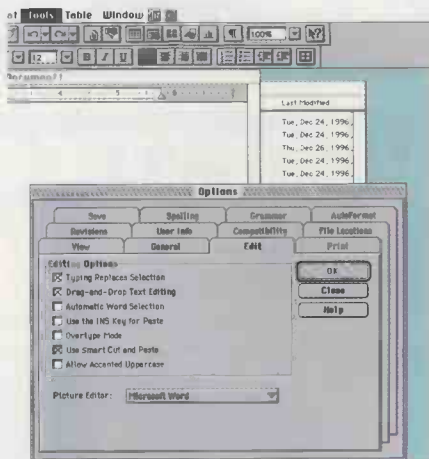


Fig 1 The System Folder contains a strict hierarchy of folders and files. When installing software, give the Finder a chance to put files in the right places, but correct any mistakes

Black Night, a fancy shareware program which uses the same neat communications tools installed in the Extensions folder (in my

Thanks to Ian Cargill of Soliton Software for solving my longest-standing gripe with Microsoft Word 5: its apparent inability to allow you to select irregular parts of words. Use the Tools/Options... menu command to display Word's settings, pick the Edit tab panel and turn Automatic Word Selection off. It's as easy as that (just a bit of tricky navigation to get there)



case, the Serial tool for the connection, and Text or TTY tools for terminal emulation). But it, too, locked up. Taking a multimeter to the cable, it was clear that the Olympus adaptor was not wired to support hardware handshaking, which the software and DSP-232 were expecting to use. When you buy (or make) Mac serial cables, make sure that each one has the special RTS and CTS lines properly connected so you can use hardware handshaking if necessary. Even when I used a correctly wired cable, or turned hardware handshaking off in favour of the weaker XON/XOFF software method, the crashes still occurred. Switching to VT220 and other tools only made things worse.

I then turned to ZTerm, a popular if vanilla-flavoured shareware comms application. Although the current version predates a proper release version of Open Transport, ZTerm wisely fights shy of the Communications Toolbox while apparently remaining totally compatible with Open Transport. When in plain text mode you can set it to ignore the eighth bit of received characters, and in this way it sat and scrolled its way through pages and pages

of Navtex, packet radio and the gibberish of noise, for hour after hour.

The lesson is that keeping it simple often keeps it stable. Because Apple has switched from the sophisticated but idiosyncratic Communications Toolbox to the sleeker Open Transport, older comms programs may be working through several layers of emulation (the 68K emulator on a Power Mac, and Open Transport's emulated support for tools) and with tools that were never completely debugged. Bring on the truly native Open Transport comms programs and all this should be a thing of the past, but they're not here just yet.

PCW Contacts

Contact Howard Oakley via the usual PCW address or email mac@pcw.vnu.co.uk

Apple Computer: 0181 569 1199. Web address www.apple.com and www.euro.apple.com
AEA radio modems and radio hardware are distributed by Nevada: 01705 662145. Web address www.nevada.co.uk/
ZTerm 1.0.1 is \$30 shareware by David Alverson, available from all Mac online resources
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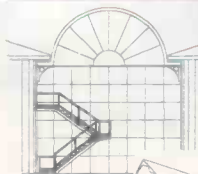
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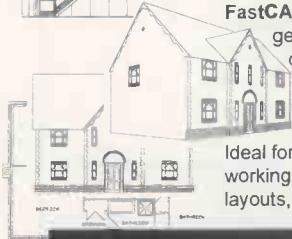


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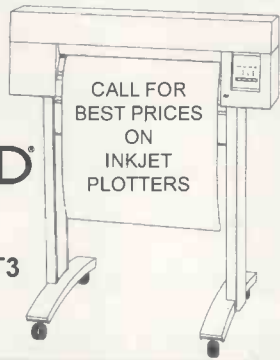
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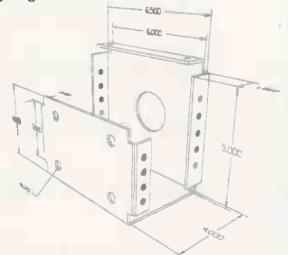
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Card sharp

You'll find a sound card and/or a graphics card in almost every PC sold these days. Here we present an overview of the technical concepts involved in both.

Just about every consumer PC sold these days comes with a sound card. But back in the quiet, dark ages when the PC was first conceived, sound was the last thing on the agenda. Computers were purely business tools and the internal speaker was only present so that it could beep when you did something wrong.

But with the increase in popularity of multimedia in the last few years, sound cards have advanced considerably and there is a vast range available from £25 to £250. Alongside making games and multimedia sound wonderful, they can allow you to compose, edit and print your own music as well as record and edit digital audio and play audio CDs from your desktop.

Whether you're buying a sound card for the first time or upgrading your existing model, it helps to understand some of the underlying principles of sound generation on PCs. Here we've given a brief summary of the most important technical concepts relating to sound.

Frequency Modulation (FM)

This was the first standard technology to be used in sound cards. It was also used in the first music synthesisers and made a huge impact on the pop world back in the early eighties. FM works by overlaying a number of simple sound waves in order to simulate real instruments. However, this technique can only approximate the sound of a guitar (for example) because the real thing is far too complex for FM to reproduce accurately. Wavetable synthesis (described here) is much more realistic.

Musical Instrument Digital Interface (MIDI)

This was developed as a communications protocol for musical instruments to "talk" to each other. Today it is used mainly for sequencing, which allows complex musical arrangements to be built up that would be impossible to play by one person alone. The most common instructions tell

the receiving instrument to play a particular note for a duration of time and how loud to play it.

General MIDI

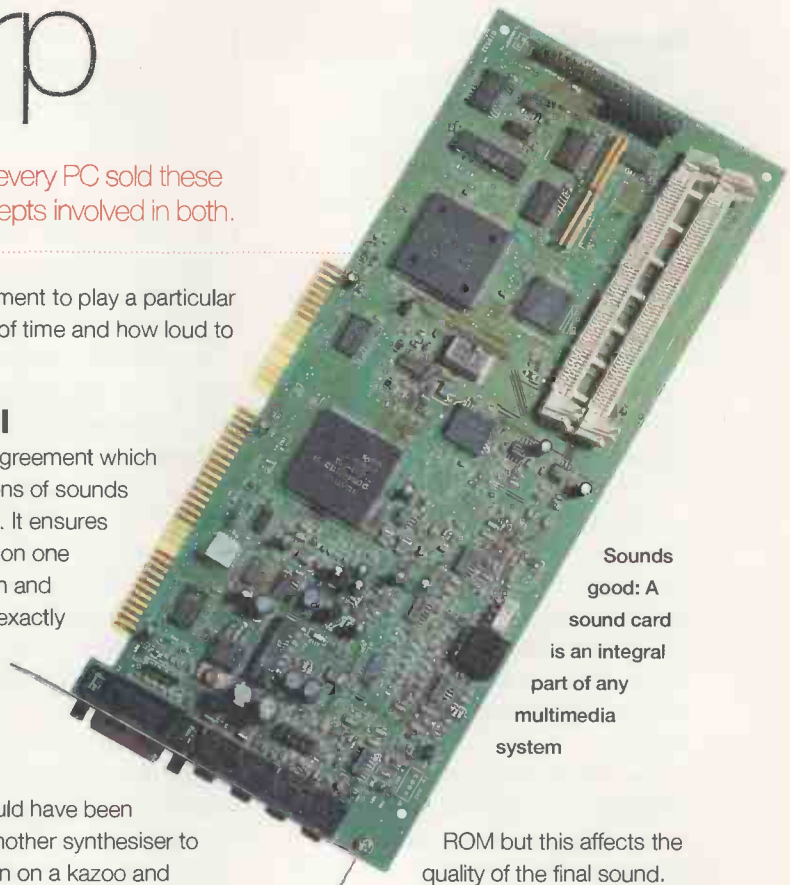
This is a standard agreement which specifies the locations of sounds within a synthesiser. It ensures that a piece written on one synthesiser for drum and bass will come out exactly the same when played through any other synthesiser. Before General MIDI was implemented, it would have been quite possible for another synthesiser to play the composition on a kazoo and French horn. With the possible exception of fanatical modern jazz aficionados, most people appreciate hearing music as it is meant to be heard.

DSP (Digital Signal Processor)

A DSP chip allows the use of effects like reverb, echo, stereo chorus and delay, adding considerably to the overall quality of the sound. Using the same technology, some modern hi-fi systems give you the option of hearing music as if it's being played in a concert hall or a football stadium.

Wavetable

Sound cards with wavetable synthesis play back pre-recorded samples of real instruments. The quality of the samples can vary considerably because of the factors involved in recording the sounds. These include the quality of the original recordings, the number of samples taken for each instrument and the method of compression used. Because they sound different depending on how they are played, a number of different samples have to be recorded for each instrument. A high-compression method means that many samples can be stored in the wavetable



Sounds good: A sound card is an integral part of any multimedia system

ROM but this affects the quality of the final sound.

A wavetable card will usually have between 1Mb and 4Mb ROM (the bigger the better) but reproducing a piano's sound accurately could take up as much as 10Mb, so it's understandable that synthesised instruments never really sound like the real thing.

Wavetable Daughterboard

If you're thinking of improving the sound capability of your PC, check out your existing sound card first to see if it has a feature connector. If it does, then you could save some money by upgrading the card with a wavetable daughterboard. Wavetable daughterboards are compatible with any 16-bit sound card that has a feature connector. This is located to the bottom left-hand side of the card near the blanking plate and looks similar to a CD-ROM interface, only smaller. Some cards, including the Value edition of the SoundBlaster 16, do not have this connector, so check first.

Installing a wavetable daughterboard couldn't be easier. Simply remove your sound card and "sit" the daughterboard on top, making sure the connectors are firmly attached. Three plastic spacers will also be provided which prevent the two cards from damaging each other.

SoundBlaster

This is not so much a technical issue as one of compatibility. If you're into games, make sure any sound card you buy is 100 percent SoundBlaster compatible. This will save you a lot of heartache in the long run.

Graphics Cards

Virtually every PC contains a graphics card — it's the one your monitor lead plugs into. But what does it actually do?

Data from the CPU is fed into the graphics card where it is processed and placed in the Video Memory. This stores a "mirror" of the image that you see on your monitor. The "mirror" is read by the Digital Analogue Converter (RAMDAC) and converted from digital data to analogue information which is sent to the monitor. This happens many times a second — the refresh rate (in Hz (hertz)) is the number of times per second that the screen is redrawn.

This should give you some idea of the amount of information a graphics card has to deal with. Consider a Windows environment at 1024 x 768 resolution with 24-bit colour depth. Each screen here is made up of 18,874,368 bits of information. That's a lot, but let's not forget that the screen should be redisplayed at least 75 times a second. That's 1,415,577,600 bits of information every second!

How does the graphics card cope? There are two factors. Firstly, the size of the RAM on the card must be large enough to contain an entire "mirror" of the screen image. If you've got 1Mb there's no way your card could cope with the example given above.

Plug and Play

"Plug and Play" is a standard introduced by Microsoft in Windows 95. Essentially, it was introduced to make the installation of new devices easier by automating the whole process.

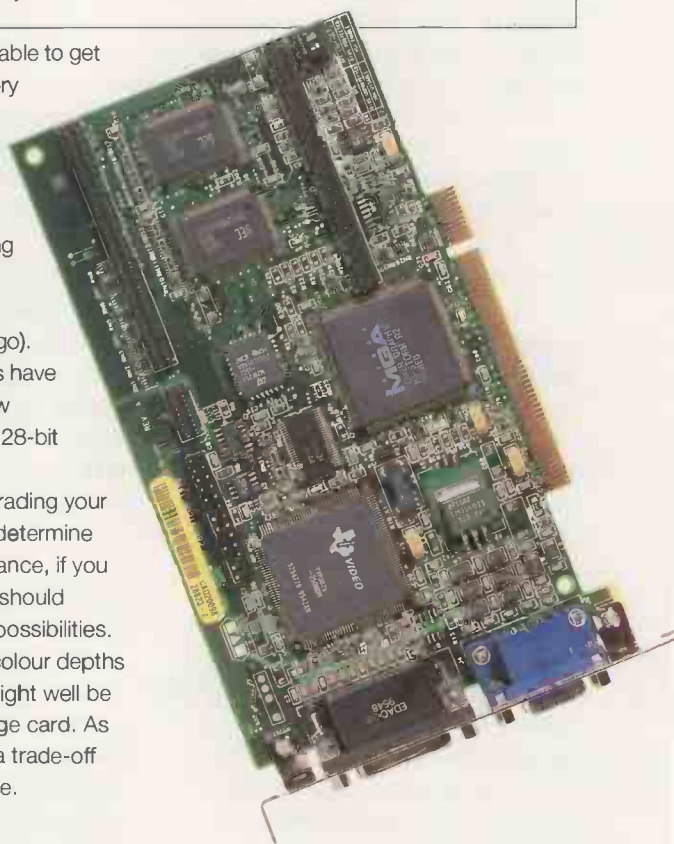
Windows 95 includes drivers for a large number of sound cards and should automatically detect plug-and-play cards on installation. It scans your files for existing drivers on installation. If the card's drivers are pre-bundled with the OS, they'll be installed and configured for you. If not, you'll be prompted for an installation disk.

Sound cards which are not plug-and-play compatible must be installed manually using the Add New Hardware wizard in Windows 95. As with many plug-and-play devices, the "seamless integration" concept does not always find its way into reality, and often, cards which claim to conform to the plug-and-play standard do not install smoothly.

Secondly, the card must be able to get the data out of the Video Memory and into the monitor quickly. The speed of the RAMDAC and Video Memory both affect this performance considerably.

The other factor in processing the data is the size of the Video Memory bus (how many bits of information can be read in one go). Most graphics cards these days have 64-bit buses, but there are a few (expensive) cards around with 128-bit buses.

If you're thinking about upgrading your graphics card you should first determine what you want from it. For instance, if you play a lot of games, a 3D card should feature strongly on your list of possibilities. Are high resolutions and high colour depths important to you? If not, you might well be perfectly happy with a mid-range card. As always with PC hardware, it's a trade-off between price and performance.



Glossary

DRAM (Dynamic Random Access Memory) Standard memory chip mainly used in older PCs. Less efficient than VRAM or EDO RAM.

EDO RAM (Extended Data Out RAM) A more efficient type of memory with faster access time. Almost all new PCs are fitted with EDO RAM.

VRAM (Video RAM) Fast memory optimised for graphics cards. Faster than EDO RAM.

WRAM (Windows RAM) Fast video memory optimised for displaying Windows.

RAMDAC or DAC (Random Access Memory Digital to Analogue Converter) Converts the digital data from the PC to the analogue information required by the monitor for display.

LPB (Local peripheral Bus) A specific feature connector used to

connect MPEG or other related components (such as TV tuners) to the graphics card.

Refresh Rate (or vertical scan rate) The frequency with which the whole screen is refreshed (or redrawn). At 60Hz (60 times per second) flicker is quite apparent. Above 72Hz the flicker appears to go away. Increasing the refresh rate above 75Hz makes the image increasingly solid.

Interlacing Where only every other line on the screen is refreshed with each pass. The result is very flickery and certainly not recommended for long periods.

Virtual Desktop When the card is capable of holding in its memory a screen image bigger than that displayed on the monitor. The monitor acts as a window onto a larger desktop.

On-the-fly-switching The ability to change screen resolution, colour depth or refresh rates without having to restart your PC.

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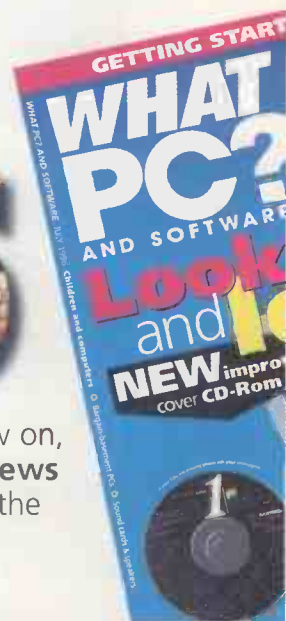
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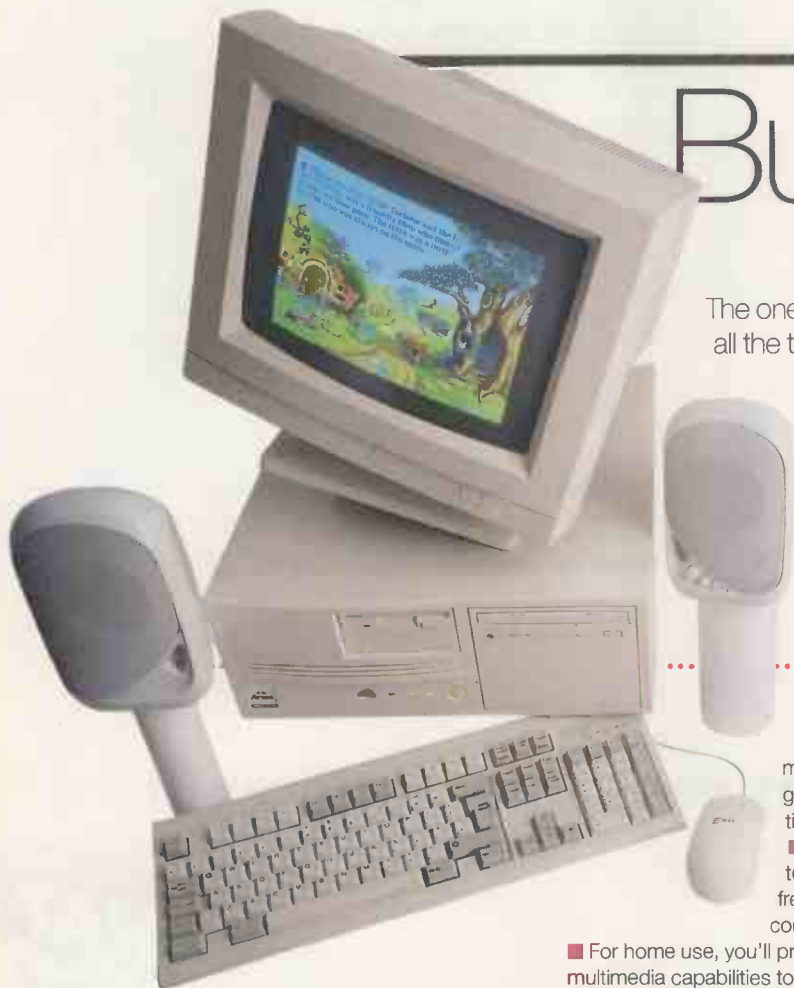


For starters, the **after hours** team serve up the **latest games** news and **reviews**. To follow on, we've got two new and exciting additions: first a **feast** for the **family** with **news**, **CD reviews** and **PC projects** for all ages to enjoy; then it's all washed down with our surfer's paradise, the ultimate guide to what's on the Internet.



No-nonsense Buyer's Guide

Buying a **PC**



The one universal rule is that PCs get cheaper, better and faster all the time. The result is that your state-of-the-art PC can become outdated and old-fashioned in a couple of years. It may still work perfectly well, but it probably won't run very fast and won't run the latest software. If you're just planning to do simple word processing, this may not matter. But we're assuming here that you want to buy a general-purpose multimedia PC that can play games, use CD-ROMs and run a range of modern software.

Buying Don'ts

- Don't buy a machine with less than 16Mb of memory if you plan to run Windows 95.
- Avoid cheap 14in monitors.
- Bundled 14.4kb/sec modems are not the bargain they seem. Opt for 28.8kb/sec or one of the new 33.6kb/sec modems when they become available.

Buying Do's

- You can never have too much disk space. Spend extra cash on buying the next largest hard disk size.
- Make sure Pentium motherboards have an Intel Triton chipset; either 430HX or 430VX.
- Check the warranty. Is it for on-site or back-to-base repairs? If it's on-site, does the

manufacturer offer guaranteed response times?

- Check the technical support. Is it free? Is it easy to contact?

■ For home use, you'll probably want full multimedia capabilities to enable you to use CD-ROM games and edutainment products and play video clips. This should include at least a 16-bit SoundBlaster-compatible soundcard and speakers.

■ Think about ordering more memory. RAM prices are low at the moment but creeping up — you can pick up 16Mb of EDO RAM for around £100 or less

Upgrading memory to 32Mb is also the quickest way to improve the performance of your machine — often more so than upgrading your processor.

■ Look at the software bundle. If you want an office suite, it is far cheaper to buy it as part of the bundle. Larger manufacturers can offer MS Office, for example, at about one third of the recommended retail price. Multimedia CD-ROM bundles will not include the UK version of Encarta 96 — Microsoft only allows the US version to be bundled.

Other things to consider

PCs have become similar in the last few years. The days when smallish computer companies designed their own chipsets (the chips that assist the computer's main processor) are long gone. Most small box-shifters buy their motherboards from Taiwanese manufacturers. Larger companies either design motherboards themselves (Apricot, Compaq, IBM) or get motherboards built by other companies to their specifications (Gateway).

Cyrix chips are worth considering. Their 6x86 chips, such as the P133+, are often cheaper and give better performance than their Intel counterparts.

If you are serious about multimedia, it may be worth upgrading your soundcard to a 16-bit wavetable card. A six-speed CD-ROM drive will give you a noticeable performance gain over a quad-speed, but the speed increase of an eight-speed over a six-speed is less tangible. Remember that, unlike your hi-fi setup, good speakers are powered from the mains, not from your PC.

You can read our up-to-date PC reviews in every issue of PCW.

PCW Second-hand specification

Buying second-hand or discontinued kit is the cheapest way to get started. This is the minimum spec we think you should go choose for general business use, playing games and accessing the internet.

- Windows 3.1 or 3.11
- DX2 66MHz 486 processor
- 8Mb RAM
- Graphics card with 512Kb of memory
- 200Mb hard disk
- 3.5in floppy disk
- CD-ROM drive
- 14in colour monitor

PCW Minimum specification

This is the absolute minimum spec we think you should consider if you're buying a new PC. Suitable for general business use: word processing, databases and spreadsheets and, with a modem, accessing the internet.

- Windows 95
- 100MHz Pentium processor
- 16Mb RAM
- Graphics card with 1Mb of memory
- 1.2Gb hard disk
- Quad-speed CD-ROM drive
- 14in colour monitor
- PCI local bus

PCW Recommended specification

If you're not strapped for cash, this is the specification we recommend. No-one at PCW would settle for less.

- Windows 95 or Windows NT 4.0
- Pentium or equivalent 166MHz processor (a fast processor will make your computer run quicker and more smoothly)
- 256Kb secondary cache
- 32Mb EDO RAM.
- Graphics card with 2Mb of memory
- 2Gb hard disk — modern computer software takes up a lot of space
- Six-speed CD-ROM drive (video clips will play more smoothly and you will be able to access files on CD-ROM disks more quickly)
- 15in colour monitor
- 16-bit SoundBlaster-compatible soundcard

PCW Best specification

This is as good a PC as you are likely to need for most software. For some specialist applications, like professional DTP or CAD, you may need even more memory, a bigger hard disk, a more powerful graphics card, or a larger monitor.

- Windows 95 or Windows NT4.0
- Pentium 200MHz MMX or Pentium Pro
- 512Kb secondary cache
- 32Mb EDO memory
- 4Gb hard disk
- Eight-speed CD-ROM drive
- 17in colour monitor
- 4Mb VRAM or VRAM graphics card (this means your graphics card can display more colours and at a higher resolution on your monitor: 16 million colours at a resolution of up to 1,280 x 1,024)
- 16-bit wavetable soundcard

* We assume that any new PC has PCI local bus and a 3.5in floppy disk drive.

Buying a Notebook



Notebooks are one area in which it's often safer to stick to brand names. Not that some of the Far Eastern kit doesn't work perfectly well, but reliability seems to be a problem and it can be fiendishly difficult to obtain spares. A useful guideline when choosing a notebook is: try before you buy.

Remember that standard notebook specifications are generally a step or two behind the desktop equivalents.

What to look for in a notebook

■ **Pointing device** There's been a wholesale move from trackballs to trackpads. Some notebooks, notably IBM Thinkpads, use stick technology (a device which looks like the rubber on top of a pencil and is controlled using one finger).

■ **CD-ROM drives** These are rapidly becoming standard in notebooks. If your notebook is going to be your only machine, it's worth getting one.

■ **Floppy disk drive** Often there's a choice between a CD-ROM drive and a floppy disk drive. If the notebook is to be your only machine, make sure the CD-ROM drive and floppy can be used simultaneously.

■ **PC Cards** Modern notebooks all have at least one PC Card slot. They take credit-card-sized expansion cards which add a fax-modem, a network interface card or even an extra hard disk to your computer.

■ **Battery life** Battery life varies from as little as 30 minutes to over six hours. Lithium Ion and Nickel Metal Hydride batteries have now replaced the older NiCad (Nickel Cadmium) batteries.

■ **TFT screens** TFT or active matrix screens are replacing the slower dual-scan or passive matrix screens. It means the screen image is refreshed far more quickly.

■ **Warranty** Drop a notebook and it may break, so it is vital to check the terms of your warranty. How long is it? What level of service is provided?

PCW Minimum specification

Notebooks change quickly. It's possible to pick up end-of-line machines with Pentium processors from brand-name manufacturers like Toshiba and Compaq at discounted prices of £1,000 or less. These can be a very good buy. Just make sure they can run the software you need to use.

PCW Recommended specification

- Windows 95
- Pentium
- Quad or six-speed CD-ROM drive
- 256Kb secondary cache
- 16Mb RAM
- On-board graphics with 1Mb of memory, PCI local bus
- 850Mb hard disk, 3.5in floppy disk drive and/or dual-speed CD-ROM drive
- TFT 800 x 600 screen

PCW Best specification

The state-of-the-art notebook: either you're loaded, or your company's picking up the tab.

- Windows 95 or Windows NT
- Pentium
- 256Kb secondary cache
- 32Mb RAM
- On-board graphics with 2Mb of VRAM memory, PCI local bus
- 1.2Gb hard disk
- 3.5in floppy disk drive
- Eight-speed CD-ROM drive
- Active matrix 1,024 x 768 TFT screen
- Long battery life



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Glossary

of computing terms

A

Access time

The time it takes for a device to access data. The access time, quoted in milliseconds (ms) for hard disks and nanoseconds (ns) for memory, is usually an average as it can vary greatly. Together with the transfer rate, it is used to gauge the performance of hard disks and other devices. The lower the number, the better the performance.

Applications

An application, or package, is one or more programs used for a particular task. For example: word processing, invoicing or spreadsheeting. Applications are bought shrink-wrapped (wrapped in cellophane for general use) or custom-built for specific uses.

ASCII (American Standard Code for Information Interchange)

Usually a synonym for plain text without any formatting (like italics, bold or hidden text). Since computers naturally use binary rather than Roman characters, text has to be converted into binary in order for the processor to understand it. ASCII assigns binary values to Roman characters. RTF, a Microsoft standard, adds extra formatting features to plain ASCII.

B

Backwards compatible

Compatibility of hardware or software to older versions of the product or standard.

Baud rate

The amount of data that can be sent along a communications channel every second. In common usage, it is often confused with bits per second. These days modem speeds are normally measured in bits per second. (See V* and Bit).

BIOS

Basic Input/Output System. Software routines that let your computer address other devices like the keyboard, monitor and disk drives.

Bit

Binary digit, the basic binary unit for storing data. It can either be 0 or 1. A Kilobit (Kbit) is 2^{10} (1,024 bits); and a Megabit is 2^{20} , which is just over a million bits. These units are often used for data transmission. For data storage, Megabytes are more generally used. A Megabyte (Mb) is 1,024 kilobytes (Kb) and a Kb is 1,024 bytes. A Gigabyte (Gb) is 1,024Mb. A byte (binary digit eight) is composed of eight bits.

Bug (See Crash)

Boot

Short for bootstrap. Refers to the process when a computer loads its operating system into memory. Reboot means to restart your computer after a crash, either with a warm reboot (where you press CtrlAltDel) or a cold reboot, where you switch the computer off and back on again.

Bus

A "data highway", which transports data from the processor to whatever component it wants to talk to. There are many different kinds of bus, including ISA, EISA, MCA, and local bus (PCI and VL-bus).

C

Cache (See Memory)

COAST

Cache On A Stick.

CD-ROM

A CD-ROM is the same as a normal audio CD, except it can store data as well as sounds. A CD-ROM player can be attached to your computer to read information from the CD-ROM into the computer's memory in the same way that a domestic CD player reads information from the

CD into your hi-fi. The advantage of distributing information on CD-ROM rather than other media is that each one can hold up to 680Mb of data — equivalent to some 485 high-density 3.5in floppy disks. The disadvantage, however, is that you can only write once on CD-ROMs, yet this makes them ideal for archiving.

CISC (See **RISC**)
CPU

Central processing unit. Normally refers to the main processor or chip inside a PC. (See Processor).

Crash

Common term for when your computer freezes. Can be caused by a power surge, a bug (which is a fault in software), or a GPF.

D

DRAM (See Memory)
DOS (Disk Operating System)

Once the standard operating system for PCs, it is now being replaced by Windows 95 and Windows NT.

DPI (Dots Per Inch)

Common measure of the resolution on a printer, a scanner or a display.

Drive controller card

An expansion card that interprets commands between the processor and the disk drives.

Drivers

Pieces of software that "drive" a peripheral. They interpret between the computer and a device such as a CD-ROM. If you have a SCSI CD-ROM drive connected, you will be able to use it on a PC or a Mac just by loading up the relevant driver on each machine.

E

EIDE (See IDE)
EISA (Extended Industry Standard Architecture)

A bus standard designed to compete with MCA. Now being replaced by PCI.

Electronic mail (E-mail, email)

Still the biggest single use of the internet. When you sign up with an ISP you are given an email address. Usually you can incorporate your name, or part of it, into your email address to make it easy to remember.

Expansion card

Circuit boards that fit inside PCs to provide extra functionality. For example, one might be an internal modem, providing the same functions as an external version (which is more common) but

sitting inside the PC. Expansion cards are designed to be fitted and removed by people with little knowledge of PCs.

F

Floppy disk drive

Practically all PCs come with a floppy disk drive. 3.5in HD (high density) 1.44Mb floppy disks are now the standard. They come in hard plastic cases and have replaced the older, literally floppy, 5.25in disks.

Fonts

A font is an alphabet designed in a particular style. Fonts apply to both screen and printed letters. TrueType and Type 1 fonts are stored as shape descriptions, scalable to any size.

Format

To wipe a floppy or hard disk in order to prepare it to accept data.

G

GPF

General protection fault.

Graphics card

An expansion card that interprets commands from the processor to the monitor. If you want a better, higher-resolution picture or more than your existing setup, you'll need to change your graphics card and/or your monitor.

GUI (Graphical User Interface)

(See Windows)

H

Hard disk

Sometimes called a fixed disk, hard disks are hermetically-sealed rigid disks able to store data and programs. Disk capacities increase all the time. The standard is now 1Gb but disks of up to 9Gb are available.

Hardware

All electronic components of a computer system, including peripherals, circuit boards and input/output devices.

HTML (Hypertext mark-up language)

The standard language used in the creation of web pages, which can be read by web browsers.

I

IBM-compatible

Originally meant any PC compatible with DOS. Now tends to mean any PC with an Intel or compatible processor capable of running DOS or Windows.

IDE

Integrated drive electronics. A



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control system designed to allow computer and device to communicate. Once the standard for PC hard disks, now being replaced by EIDE (enhanced IDE) which offers improved performance and extra features.

Internet

Millions of computers interconnected in a global network.

Internet Service Provider

ISPs provide access to the internet. You use your modem to dial the ISP's modem. The ISP has a high-bandwidth permanent connection to the internet.

IRDA

Infra-Red Data Association — the standard for exchanging data using infra-red, typically from PDAs or notebooks to a PC or printer.

ISA (Industry Standard Architecture)

This was the original bus architecture on 286 PCs. Also known as the AT bus (the 286 was known as the AT), it is still in use today. Slow by modern standards, but so widely accepted that expansion cards are still made for it. (See EISA, PCI).

ISDN (Integrated Services Digital Network)

Offers significant advantages over analogue telephone lines. It can handle multiple transfers on a single connection and is faster. In the UK, however, costs of installation and rental are still high.

J

JPEG (See MPEG)

K

Kbit (kilobit), Kb (kilobyte)

(See Bit)

L

LAN (Local Area Network)

(See Network)

Local Bus

PCI (Peripheral Component Interconnect), developed by Intel, is now the standard for local bus architecture. It is faster than the older VL-Bus (Video Electronic Standards Association local bus) it replaces.

M

Macintosh (Mac)

A personal computer made by Apple and which is incompatible with PCs. Developed as a rival standard, its operating system looks like Windows, but pre-dates it and (in some people's view) looks and works much better.

Maths co-processor

A specialised chip that handles mathematical calculations (floating point operations) for the processor. Modern processors such as the Pentium have a co-processor built into them.

Mbit (megabit) (See Bit)

Mb (megabyte) (See Bit)

MCA

A type of bus designed by IBM to beat EISA. Although faster, it never became popular because every machine that used it had to pay a royalty to IBM, and because it was not backwards-compatible with ISA.

MPEG (Moving Picture Expert Group)

A standard for compressing video available in several flavours: MPEG 1, MPEG 2, MPEG 4. JPEG (Joint Photographic Expert Group) is a standard for still image compression.

Memory

The term normally refers to RAM (Random Access Memory). This is the kind that disappears when you turn off your computer and is much faster to access than a hard disk. It acts as a staging post between your computer's hard disk and its main processor.

- **DRAM (Dynamic Random Access Memory)** This requires its contents to be replaced every 1/1000th of a second and is the most

common form of memory in PCs.

- **SRAM (StaticRAM)** Retains memory until the power is switched off.
- **VRAM (VideoRAM)** Faster than DRAM, this is used by graphics cards.
- **EDO (Extended Data Out RAM)** The latest type of memory. Offers improved performance.
- **Cache memory** Temporary memory set aside to store the information that is accessed most frequently. The Pentium processor has 8Kb of in-built cache. This can be further speeded up by a secondary cache, typically 256Kb. Part of your DRAM is often used to cache your hard disk.
- **ROM (Read-Only Memory)** A type of memory which can only be read: you can't make changes to it as you can to RAM. It is commonly used for things that will never need to be changed, such as the information the computer requires when you start it up.

MMX (Multimedia extensions)

(See Pentium)

Modem

The word is a contracted version of "modulator/demodulator", which means that a modem is a box (or, less commonly, an expansion card) that lets your computer talk over phone lines to other computers.

Monitor

Your computer's screen. Signals are sent to it from the video card.

Motherboard

The main printed circuit board which houses processor, memory and other components.

N

Network

A network is a group of computers linked together with cable. The most common form is a LAN (Local Area Network), where electronic mail and other files can be exchanged between users without swapping floppy disks. Printers

How to choose an ISP

There are now over 100 Internet Service Providers,

which makes selecting the right one a difficult task. Competition between them is now so fierce that many Providers are happy to offer a month's free trial.

All ISPs (Information Service Providers) allow you to send and receive internet email, browse the web and download files from internet servers. But there are differences between the extra services that each provides.

Large, centralised, online services like AOL and CompuServe offer discussion areas and specialised content like online magazines, and searchable file libraries and are easy to use. However they are not the fastest way of accessing the World Wide Web.

Some ISPs charge a flat-rate for internet access while others charge extra if you exceed a specified number of hours online.

The quality of the software and technical support provided also varies. In general, the big "consumer" ISPs offer better support and more commercial software. The smaller, more basic, operations often offer cheaper deals.

Some ISPs are more geared up to business users who may need a fast ISDN connection and/or require the service provider to host or even design web pages for them.

Your chosen ISP can have a big effect on the performance of your internet connection, particularly access speed to US site. Relatively few ISPs provide local call access to anywhere in the UK. In London you'll have plenty of

choice, but in the west of Scotland, say, the choice will be limited.

PCW Recommended products

Big, commercial ISPs are not cheap, but are easy to use, with plenty of extra services thrown in: **CompuServe 0800 289378; AOL 0171 385 9404**

Barebones service which is not for beginners but it does make your PC a full internet node in its own right: **Demon 0181 371 1000**

Another established service provider worth considering: **Easynet 0171 209 0990**

and other resources can be shared. All the PCs on a LAN are connected to one server, which is a powerful PC with a large hard disk that can be shared by everyone.

O
OS (Operating System)
The operating system communicates with the hardware and provides services and utilities to applications while they run, such as saving and retrieving files.

P
PC Card
Formerly PCMCIA. A standard to allow PCs, particularly notebooks, to be expanded using credit-card sized cards.

PDA (Personal Digital Assistant)
Small electronic organisers. The Psion 3a is a typical example.

PCI (See Local bus)

PCMCIA (See PC cards)

Package (See Application)

Parallel ports
Used by your PC to communicate with the outside world, usually via a printer. Information can travel in parallel along a series of lines, making it faster than serial ports which can only handle one piece of information at a time.

Pentium
Fast 32-bit processor with a built-in 16Kb cache. Now the standard on PCs. It is about to be replaced by the Pentium MMX chip which has extra instructions and a 32Kb cache. The Pentium Pro is a higher end workstation CPU with 256Kb cache meant for full 32-bit operating systems such as Windows NT.

Pixel
Picture element. The smallest addressable dot displayed on a monitor.

PowerPC
This family of RISC chips is the result of a collaboration between IBM, Apple and Motorola. It is now used in all Apple Macintosh computers and many IBM workstations.

Processor
The chip that does most of a computer's work.

Programs (See Applications)

Public domain
Software that is absolutely free. The author usually retains the copyright but you can make as many copies as you want and pass them to other people. "Public domain" software is often confused with "shareware".

Q
QWERTY
The name of a standard English-language keyboard, derived from the first six letters in the top row. The French equivalent is AZERTY.

R
RAM (Random Access Memory) (See Memory)
Reboot (see Boot)
RISC (Reduced Instruction Set Computing)
These are starting to replace CISC (Complex Instruction Set Computing), as they're usually faster. The PowerPC chip is a typical example.

ROM (Read Only Memory) (See Memory)

RTF (Rich Text Format) (See ASCII)

S
SCSI
Small Computer System Interface is a bus that comes as standard in a Macintosh and is starting to rival EIDE on PCs.

Serial port
Serial ports (com1 and com2) are used by your PC to communicate with the outside world. Serial ports are mostly used by modems and similar devices which communicate quite slowly. Faster communications are achieved via the parallel port.

Shareware
A method of distributing software. It is freely available, but not free-of-charge. You are honour-bound to pay a small fee to the software's developer if you continue to use the program after a set period.

SIMM (Single Inline Memory Module)
The standard modules for memory expansion on PCs. Older 30-pin SIMMs have now been replaced by the 72-pin variety available in capacities up to 16Mb.

T
Tape streamer
Magnetic tape recorder for backing up data from a hard disk.

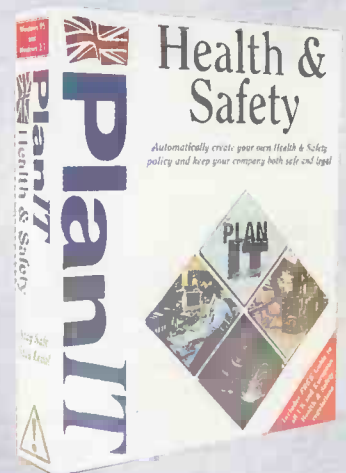
U/V
UART (Universal Asynchronous Receiver Transmitter)
Pronounced "you-art". A chip that allows your PC to cope with high-speed communications. (...Glossary continued on p334)



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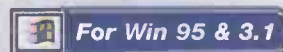
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Buying a Printer

There are two main types of printer: laser and inkjet.

Lasers

Most office printers are lasers. They work much like photocopiers, and are cheap to run and print quickly. The disadvantage is the higher initial cost and mono output. Laser printers are available in all sizes and at all prices. Small desktop printers cost as little as £300. You can buy colour laser printers but they are still expensive, typically £5,000 or more.

Types of laser

PCs print by sending a description of the page to be printed down a printer cable. There are three commonly-used page description languages (PDLs):

• PostScript

This sends an outline in vector form (see *Drawing Software*) to the printer where it is rasterised (converted into dots) and printed to the device's best ability. PostScript is device-independent so the image looks the same on a monitor (75dpi), a laser printer (300dpi) and professional image-setter (2,400dpi).

• PCL

This stands for Printer Control Language, and it is Hewlett-Packard's alternative to PostScript, licensed to many clone-printer manufacturers. Printers using this tend to be cheaper than PostScript ones but output will vary from one machine to another, making it less suited to professional use.

• GDI (graphical device interface)

These printers download the description of your page already used by Windows straight to your printer. They only work with Windows but are cheap and fast. They are only suitable for a personal printer and will not work across a network.

PCW Recommended products

- Cheap lasers Epson EPL-5500: Epson 0800 220546; street price £300 (see PCW February 1996)
- Sub-£750 lasers Hewlett-Packard 5P: Hewlett-Packard 01344 369222 (see PCW November 1995)
- Network lasers Hewlett-Packard 5P: Hewlett-Packard 01344 369222 (see PCW February 1996)

Inkjets

Inkjets work by spraying ink onto paper. There are still some mono inkjet printers available, but it is best to stick with a colour inkjet printer as the price difference is negligible. They are cheap to buy but more expensive to run, and slower. Even cheap inkjets can print in good quality colour, especially on high-resolution paper.

PCW Recommended products

- H-P Deskjet 870CXi: H-P 0990 474747; street price £311.
- Lexmark 2070: Lexmark 01628 481500; street price £280. (See PCW November 1996).



Hybrids

For home use and small offices, a hybrid could be the answer. They combine a printer, a fax machine and copying capability in one unit.

PCW Recommended products

- Brother HL 730: Brother 0161 330 6531. £270.
- Sharp JX 9210: Sharp 01753 819819. £209. (see PCW January 1997)



Buying a Scanner

Scanners are used to import text, graphics or pictures into a PC. They vary from low-cost hand scanners not much bigger than a mouse, to drum scanners costing thousands of pounds. The latter are designed to scan photographic transparencies to professional standards.



■ **Flatbed scanners**

The most common type, costing from £300 to over £3,000. They are capable of scanning colour pictures to a high standard. Most have transparency adaptors as optional extras.

■ **Document scanners**

A new category which aims to combine the reliability of flatbeds with speed and portability. They're intended for OCR and document management. Most will cope with photographs and some with colour, but it's not their forte.

• **PCW Recommended products**

Flatbed scanners

- Professional — Arcus II: Agfa 0181 231 4200; street price £2,600.
- Intermediate — Epson GTX 9000: Epson UK 01442 61144; street price £750.
- Budget — Umax Vista S6E: IMC 01344 872800; street price £299 (PCW, Sept 1996).

• **PCW Recommended products**

Document scanners

- Visioneer PaperPort VX: Computers Unlimited 0181 200 8282; street price £299.
- Logitech PageScan Colour: Logitech 01344 894300; street price £299.
- Plustek PageReader 800: Scan Direct 01292 671676; street price £149 (PCW, March 1996).



Buying a Fax Modem

You'll need a modem to connect to the internet or an online service, such as CompuServe or AOL, and also to send and receive email.

Modems are available in three formats: as PC cards to plug into notebooks, as external boxes and as expansion cards. PC card, modems cost the most and external modems cost slightly more than expansion cards.

Apart from the case and the external power supply, there's often little difference between the internal and external versions of a modem. Most modems now have built-in fax capability, which means you can receive faxes on your PC to view or print out. If you're strapped for cash, a V32bis 14.4kb/sec modem is just about adequate, although

p334 >

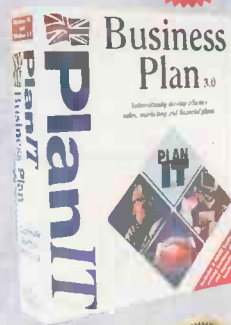


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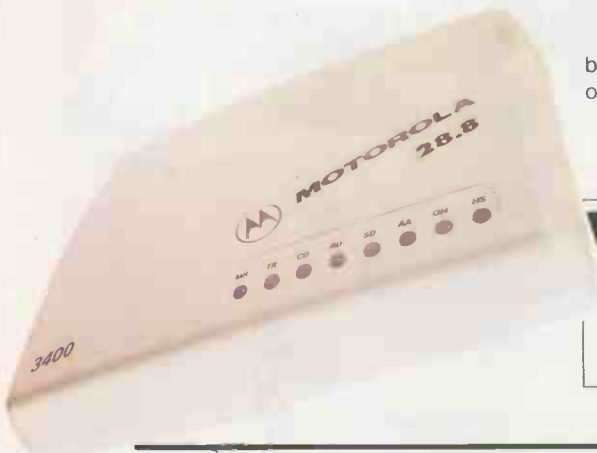
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better to buy a V34 28.8kb/sec modem or one of the new V34 Plus 33.6kb/sec modems.

PCW Recommended products

Fax modems

- External — Hayes Accura 288 Message Modem Hayes 01252 775 577 street price £145. (see PCW November 1996, December 1996).

Buying a CD-ROM Drive

Just about the only things which vary on today's CD-ROM drives are their speed and means of connection. The most common connection is IDE or Enhanced IDE (EIDE). It is possible to connect an IDE CD-ROM drive to most existing IDE hard disk controllers. Older PCs may need a newer EIDE controller. IDE controllers are also found on many soundcards.

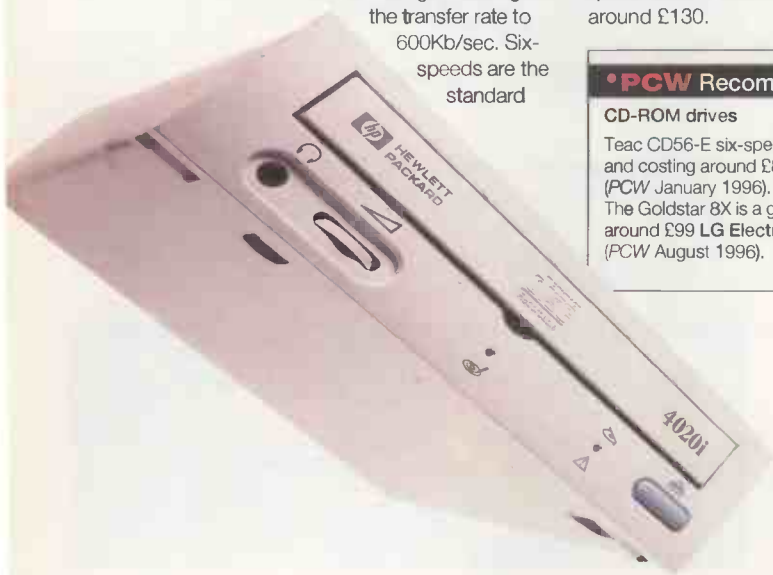
The first CD-ROM drives spun the disc at the same speed as an audio CD and were called single-speed, delivering a sustained data transfer rate of 150Kb/sec. Double-speed drives spun twice as fast, doubling the data transfer to 300Kb/sec, and quad-speeds twice as fast again, raising the transfer rate to 600Kb/sec. Six-speeds are the standard

(900Kb/sec), with eight-speeds (1,200Kb/sec) becoming increasingly common. All figures are theoretical maximums. Buyers should go for quad-speed or higher. There is little to choose between models, but off-the-shelf supplies are frequently short. Internal IDE quads start at around £100 and six-speeds around £130.

PCW Recommended products

CD-ROM drives

- Teac CD56-E six-speed: fitted to many new PCs and costing around £85 Teac 01923 225235 (PCW January 1996).
- The Goldstar 8X is a good eight-speed choice for around £99 LG Electronics 01753 691 888 (PCW August 1996).



Glossary

(contd. from p331)

V34 Plus, V34, V32bis

A series of CCITT standards that defines modem operations and error correction. There are more than 20, but the key ones are:

- V32.bis, the standard for 14.4kb/sec modems.
- V34, the standard for 28.8kb/sec modems (see Baud).
- V34 Plus, the new standard for speeds up to 33.6kb/sec.

VESA (See Local Bus)

VGA

Video Graphics Array is the name given to a popular display. VGA graphics have 640 pixels horizontally and 480 vertically, and can display 16 colours. SuperVGA (SVGA) graphics can display 800 x 600 or 1,024 x 768 in as many colours as the memory in your graphics card will allow: up to 16.4 million, or true colour.

VL-Bus (See Local Bus)

VRAM (See Memory)

W

Windows

A GUI (Graphical User Interface) developed by Microsoft. Windows is intended to make programs easier to use by giving them a standard, mouse-driven interface.

- Windows 3.11 16-bit operating system.
- Windows NT Robust, fully 32-bit operating system from Microsoft. The latest, version 4.0, features a Windows 95 interface.
- Windows 95 Major improvement to Windows 3.11, with a redesigned interface. Less prone to crashes and easier to use, but requires more memory.

Winsock

Short for "sockets for Windows". The Winsock.dll is an extension for Windows which is necessary for connecting to TCP/IP networks.

World wide web

A service on the internet which uses special software called web browsers (Netscape and Internet Explorer are the two best-known ones) to give you access to pages of information with text, pictures and multimedia.

WYSIWYG

An acronym for "What You See Is What You Get". What you see on the screen is exactly what you get when you print out your work.

Z

ZIF (Zero Insertion Force)

Sockets which are used for large CPUs. Lifting a handle enables you to remove the processor.

ZIP

The common standard for compressing files so that they take up less space. Zipped files have the extension .zip and are compressed and decompressed using shareware utilities such as Winzip and PKZIP.

Buying a Graphics Card



The graphics card sits inside the PC and controls the features which the software can display on the monitor.

Check the amount of memory on the card. 2Mb is standard these days, 1Mb is skimpy and 512Kb is barely usable. Better-

quality cards are likely to be fitted with VRAM (Video RAM). Also, check out the performance capability of the card. Video cards come as 16-bit, 32-bit, 64-bit and even 128-bit: all you need to know is that a large number of bits means faster performance and more colours.

The most important aspect of your video card, and the most frequently quoted feature, relates to the resolution which the card supports in Windows. This is measured in terms of the number of pixels that the card displays on screen. The absolute minimum these days is 1,024 x 768 with a refresh rate of 70Hz.

A 2Mb card can display 16-bit colour (65,000 colours) at 1,024 x 768 pixels. A 1Mb card can only manage 8-bit colour (256 colours) at 1,024 x 768 pixels. To display 24-bit colour (16 million colours) at 1,024 x 768 you'll need 4Mb of memory.

The refresh rate (measured in hertz) is important, too. It represents the number of frames displayed on-screen per second. A flickering display is very tiring to use.

Finally, find out whether your video card is "local bus" or not. Local

bus is a type of interface which connects your video card to the motherboard. It allows the memory in the card to be addressed directly by the CPU which makes it a lot faster than the standard ISA interface.

PCW Recommended products

Graphics cards

ATI Video Xpression: ATI Technologies 01235 833666; around £175 (see Graphics Card group test, PCW June 1996)

Matrox Millennium: Matrox 01793 441144 £150

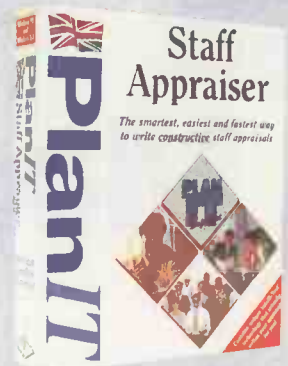
VideoLogic GrafixStar 600: VideoLogic 01923 260511 from about £150



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Buying a Monitor

Regardless of your computer application, you'll be looking at your monitor all day, so make sure you get a good one.

Some people claim not to see monitor flicker, but your brain does, resulting in fatigue and headaches. A refresh rate of 70Hz or higher will produce a flicker-free image on most monitors.

Interlacing also results in flicker. Always run in non-interlaced modes and ignore interlaced quotes. The resolution refers to the number of dots (pixels) horizontally and vertically on-screen. Standard VGA mode runs at 640 x 480 pixels, while other typical modes include 800 x 600 and 1,024 x 768. The more pixels, the more you'll be able to fit on screen, but

everything will be smaller and may only be suitable on a larger screen. Go for a 15in or 17in monitor capable of running a resolution of 1,024 x 768 non-interlaced at 70Hz or higher. The visible area of most monitors (and TVs for that matter) is smaller than the model implies: a 15in screen may only have a 14.5in visible area, and a 17in may have only 16in visible.



PCW Recommended products

- For a 15in screen: try the CTX 1569MS (around £300) or the NEC M500 multimedia CTX 01923 818461 NEC 0181 993 8111 (around £410 on the street).
- At 17ins there's the Sony 17sfl1 or the Taxan Ergovision 730TCC-S at around £500 Taxan 01344 484646 (PCW July 1996).



Buying a Sound Card

You need one of these to add sound capability to your PC.

Check compatibility with your CD-ROM drive, and remember that 16-bit cards capable of 44KHz provide higher-quality sound than slower 8-bit cards. Better soundcards now include wavetable synthesis which means they have samples of real instruments held in ROM.

The quality of wavetable synthesis still varies widely. Even cheap cards which have the inferior Frequency Modulation synthesis should have a daughterboard connector allowing them to be upgraded to wavetable. The newer cards are also plug and play which

means, in theory, that you should be able to plug them straight into a PC without any extra configuration. Most cards are bundled with extra software, normally sequencers, wave editors and audio players.

PCW Recommended products

- AWE-32: Creative Labs 01245 265265; £199 (PCW, April 1996).
- Aztech SoundGalaxy Waverider Pro: Aztech 01734 814121; £79 (PCW, April 1996).

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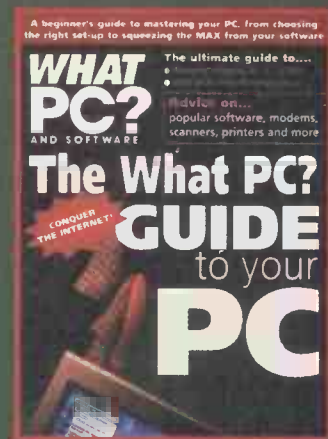
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Gordon Laing, PCW Magazine

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Buying Software

Only a few years ago there were dozens of different software applications in each category. During the last two years or so, however, there has been rapid product consolidation. Other magazines list large numbers of packages, most of which are out of date and not worth considering. We've distilled each category down to just one or two recommended products.

Software A-Z

A

■ **ACCOUNTS SOFTWARE** One of the few categories in which there are still masses of packages on the market at a huge range of different prices. Accounts is also one of the last bastions of DOS. **Recommended products:** Lakeview LMS and Exchequer from SBS Systems.

B

■ **BROWSER** Programs used to navigate the internet. A modern browser lets you navigate web pages, download files and send and receive email.

Recommended products: There are only two worth talking about: Netscape Navigator and MS Internet Explorer.

C

■ **CAD SOFTWARE** Computer Aided Design covers everything from architectural drawings through office planning to complex engineering drawings. **Recommended products:** AutoCAD is the industry standard but we think MicroStation 95 is a more capable product at the high end. At the cheap end, DesignCAD 3D offers astonishing value for money.

■ **CONTACT MANAGERS** (see PIMs)

D

■ **DATABASE** At its simplest, an electronic card index. For just a few hundred names and addresses, an electronic-type Filofax such as Lotus Organizer may be more appropriate. But for more sophisticated applications like tracking products and customers, the power of a relational database is required. Databases are generally the least user-friendly of the main suite

applications. In most offices you are likely to use a database application that somebody else has written for you.

Recommended products: Lotus Approach, Microsoft Access.

■ **DESKTOP PUBLISHING SOFTWARE (DTP)** This is software used to create newsletters, magazines, books, brochures or adverts.

Typically, it allows you to incorporate graphics, lay out text in multiple columns and to run text around graphics. You also have control over how text appears including the leading (pronounced ledding) which is the space between lines of text and kerning, which is the space between individual letters.

Recommended products: The high-end market leader is Quark Xpress on Macintosh. On the PC, Pagemaker is strong. For serious work on a budget we recommend Serif Publishing Suite and for sheer ease-of-use Microsoft Publisher.

■ **DRAWING SOFTWARE** Programs for drawing, that work using vectors. This means each shape drawn is described using mathematical equations.

Recommended products: At the budget end, GSP Designworks 3 stands out. At the professional end of things, FreeHand 5 gets our plaudits.

I

■ **IMAGE EDITING SOFTWARE** A program for editing bitmap files (files made up of pixels). Typically used for converting graphics files, retouching photographs and preparing pictures for printing.

Recommended products: For simple image editing the popular shareware program Paintshop Pro is fine. For professionals, Adobe's Photoshop is the industry standard.

■ INTEGRATED PACKAGES

Typically these combine the functionality of a database, word processor and spreadsheet in one application. This makes it easy to move data from one component to another, but integrated packages tend to lack some of the advanced features of individual applications.

Recommended product: Microsoft Works.

■ MULTIMEDIA AUTHORING TOOLS

Programs designed for "producing interactive multimedia applications, typically for training applications or for CD-ROMs. The software lets you control and manipulate different types of media like sound files, audio files, video clips and graphic files.

Recommended product: Macromedia Director, the product used to produce PCW's cover-mounted CD-ROM, gets our vote.

O

■ **OCR SOFTWARE** Optical Character Recognition software converts printed text into computer text you can edit. You will also need a scanner or fax card to get the printed text onto your PC. OCR saves re-keying documents and can cut down drastically on paper filing systems.

Recommended products: Omnipage is the best product we have found, but TextBridge offers most of the same capabilities for less cash.

P

■ **PERSONAL INFORMATION MANAGERS (PIMs)** PIMs are an electronic way of storing names, addresses, phone numbers and appointments. Contact managers take the idea one step further to include business information about dealings with clients.

Recommended products: Sidekick 95 and Organizer are

excellent PIMs. For contact managers we recommend Goldmine for Windows.

■ **PRESENTATION GRAPHICS** Increasingly the trend is towards doing presentations on a PC and the latest packages tackle this by including sound, sophisticated transitions between slides and support for video clips.

Recommended products: Powerpoint and FreeHand are both capable products sold with Microsoft Office and SmartSuite respectively.

■ PROGRAMMING TOOLS

Applications designed for writing software. These range from "low-level" languages which are powerful but difficult to learn and use, to "high-level" languages which, although much easier to use, generally sacrifice performance and flexibility in the process.

Commercial programs like Word for Windows are written using low level languages. Bespoke applications and prototypes are often written using Delphi or Visual Basic.

Recommended products: Delphi 2.0 is a great example of scalability, catering for beginners and serious developers working on major projects. Visual C++ is the pick of the high-end Windows development tools.

■ **PERSONAL FINANCE PACKAGES** These help you manage home finances. They're also well-suited to some small businesses and tend to be easier to use than full-blown accounts packages.

Recommended product: Quicken is the outstanding product in this category and has no serious rivals.

■ PROJECT MANAGEMENT

Programs for managing large projects. Anything from building a power station to planning a

marketing campaign.

Recommended products: SuperProject 4.0 for Windows

R

■ **REMOTE CONTROL SOFTWARE** Software which lets you access and control a PC remotely, usually by using a modem.

Recommended products: ReachOut, for its simple interface and support for different networks, particularly TCP/IP.

S

■ **SPREADSHEET** An electronic version of an old-fashioned ledger. Excellent graphing and charting facilities are included nowadays.

Recommended products: Lotus 1-2-3, Microsoft Excel.

■ **SUITES** Most general business software (word processors, spreadsheets, presentation

graphics packages) is now sold in suites.

Two suites are widely available: Lotus SmartSuite and Microsoft Office. Lotus SmartSuite also contains a database.

For Microsoft Office, you pay extra for Office Professional which contains Microsoft's Access database.

Recommended product: Microsoft Office is close to the industry standard. Its high level of integration gives it the edge over the opposition.

V

■ **VISUAL PROGRAMMING** (see Programming Tools).

W

■ **WEB EDITORS** Programs designed to do for web page design what DTP did for magazines and newsletters. They allow you to create web pages without manually writing HTML. You can

also incorporate graphics, backgrounds, tables, images and sounds into web pages.

Recommended products: HotMetal Pro 3.0 is our first choice. Adobe Pagemill is a capable alternative.

■ **WORD PROCESSOR** An application in which you can write letters and prepare reports, or even produce a simple newsletter.

The latest word processors have advanced features such as outliners, table editors and facilities for adding columns of figures.

Recommended products: Microsoft Word is the clear market leader. WordPro (formerly AmiPro) is a capable alternative.

■ *If you want to obtain any of the reviews listed and do not have the original issues, order PCW on CD-ROM. It costs just £9.95 (including postage and packing). See pages 20/21.*

A-Z of Recommended Software Products

Category	Product	Supplier	Contact	Price (ex VAT)	Date of PCW review	
A	Accounts	Lakeview LM3	Lakeview Computers	0181 303 3329	£8,750	Jan 1996
	Accounts	Exchequor	SBS Financial Systems	01202 298008	£5,980	Jan 1996
B	Browsers	Netscape Navigator	Netscape	0181 564 5100	£49	Mar 1997
	Browsers	Internet Explorer	Microsoft	0345 002000	Free	Jun 1996
C	CAD	Microstation	Bentley	001344 412 233	£3,495	Jan 1997
	CAD	DesignCAD 3D	BVG	01874 611 633	£149.95	Jan 1997
D	Database	Approach	Lotus	01784 455445	£99	Nov 1996
	Database	Access	Microsoft	0345 002000	£220	Nov 1996
	Desktop publishing	XPress 3.3	Quark	01483 454 397	£795	Apr 1996
	Desktop publishing	Publisher	Microsoft	01734 270 000	£70	Apr 1996
	Desktop publishing	Publishing Suite 3.07	Serif	0115 942 1502	£99	Apr 1996
	Drawing	Freehand 5	MacroMedia	01344 761111	£450	Apr 1996
	Drawing	Designworks 3	GSP	01480 496789	£39.95	Apr 1996
I	Image editing	Photoshop	Adobe	0181 606 4000	£382	Dec 1996
	Image editing	Paintshop Pro	Digital Workshop	01295 258335	£49.95	Jun 1995
	Integrated package	Works	Microsoft	0345 002000	£79.99	Oct 1995
M	Multimedia authoring	Director 5.0	Macromedia	0181 200 8282	£99	Oct 1996
O	OCR	Omnipage	Caere	0171 630 5586	£595	Nov 1995
	OCR	Textbridge	Xerox Imaging Systems	01734 668421	£349	Nov 1995
P	Personal finance	Quicken	Intuit	0800 585058	£39.95 (incl VAT)	May 1996
	PIM/contact manager	Organizer 2.1	Lotus	01784 455445	£99	Mar 1996
	PIM/contact manager	Goldmine for Windows	Elan Software	0171 454 1790	£395	Mar 1996
	PIM/contact manager	Sidekick 95	Starfish UK	0181 875 4400	£39	Mar 1996
	Presentation graphics	Freelance	Lotus	01784 455445	£415	Nov 1996
	Presentation graphics	Powerpoint	Microsoft	0345 002000	£220	Nov 1996
	Programming tools	Visual C++	Microsoft	0345 002000	£379	Feb 1996
	Programming tools	Delphi 2.0	Borland	01734 320022	£249	Feb 1996
	Project management	SuperProject 4.0	Computer Associates	01753 679679	£495	May 1996
R	Remote control	Reachout	Stac Electronics	01483 740763	£110	Nov 1995
S	Spreadsheet	Excel	Microsoft	0345 002000	£220	May 1995
	Spreadsheet	1-2-3	Lotus	01784 455445	£365	May 1995
	Suite	Office (Standard)	Microsoft	0345 002000	£360	Mar/Dec 1996
	Suite	Office (Professional)	Microsoft	0345 002000	£460	Mar/Dec 1996
W	Web authoring	HotMetal Pro	SoftQuad	0181 236 1001	£99	Oct 1996
	Web authoring	Fusion	NetObjects	(US) 415-482 3297 (US\$695)		Jan 1997
	Word processing	Word	Microsoft	0345 002000	£220	Oct 1996
	Word processing	WordPro (AmiPro)	Lotus	01784 455445	£99	Oct 1996

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These useful sections, designed to help you with your hardware and software buying decisions, can be found throughout the magazine, starting with the Advertising Index on page 12.

“ Dan has a reputation for building good quality, fast PCs, and in this respect, the Ultimate is no exception. ”

dan Ultimate/166, PC Magazine, September '96



dan Ultimate PC

The PC System you always dreamed of

- 32MB EDO RAM
- Fast 2.5GB HDD
- Intel Pentium® Processor
- 100MB ZIP Drive or 2GB Ditto streamer
- 512KB Pipeline Burst Cache Memory
- Fast Graphics card 2MB EDO RAM/64-bit
- 17" Iiyama L/R N/I Monitor (8617E)
- 12xSpeed CD-ROM
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- Hi-Fi Power dan Speakers (80W PMPO)
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133MHz	£ 1637	£ 1924 incl. VAT	£ 63.43
150MHz	£ 1660	£ 1951 incl. VAT	£ 64.31
166MHz	£ 1762	£ 2071 incl. VAT	£ 68.23
200MHz	£ 1918	£ 2254 incl. VAT	£ 74.21

166MMX	£ 1819	£ 2138 incl. VAT	£ 70.42
200MMX	£ 1959	£ 2302 incl. VAT	£ 75.77

3GB HDD Upgrade £ 33 (£39 inc VAT)

The dan Ultimate PC is a highly specified system based on the Pentium Processor. It has been updated to include more popular upgrades to ensure ultimate performance.

Super-fast processing power is an important element

for the Ultimate PC and together with the Pentium Processor, this system achieves an excellent rating with 512KB of Pipeline Burst Mode Cache Memory combined with 32MB of fast EDO RAM.

A spacious 2.5GB hard disk drive is included in the specification and this can be upgraded to a maximum of 6GB. Also included is a 17" high quality monitor which is

partnered with a 64-bit 2MB EDO RAM video card for powerful graphics, and a 28.8/33.6KBPS fax/modem.

Exceptional Hi-Fi sound is a reality with the multimedia kit which incorporates a 12x speed CD ROM and now there is a choice of either the removable Iomega 100MB Zip Drive or the Iomega 2GB Ditto tape drive. Please see below for further details.

Iomega 100MB Zip Drive

100MB of Removable Storage for £12

The Zip is a very affordable personal storage solution that uses 100MB cartridges. You can either backup your entire hard drive or copy selected files up to 100MB. It's an ideal way to move and store personal or confidential information. The Zip cartridges are robust yet small, light and convenient. They're great for multimedia, software applications, presentations, financial data, graphics and more.



Iomega Tape Streamers

Store up to 2GB of compressed data quickly, easily and dependably. The Ditto is an internal tape drive that's easy for anyone to use and there's no need to learn new software. Ditto tools

1-step backup software helps you backup, restore or copy one file, a few files, or your entire hard disk. If you can click a mouse button, you can backup with Ditto. And for those who need advanced functionality Ditto's Works software gives you every detailed customisation option you could ever want.



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New systems based on the Pentium® PRO Processor

The configurations of dan systems are upgradable but not downgradable

The dan PRO PC Range

The dan Ultimate PRO and the dantum PRO for Business (dantum PRO/B) are the latest additions to the dan range, launched to take maximum advantage of the new Intel chipset for the Pentium® PRO Processor.

The Pentium® PRO is a true 32-bit processor and is particularly suited to operating systems like Windows NT. The growing demand for Windows NT in the business environment means that an ever increasing number of users are requesting the kind of power the dantum PRO can deliver.

The Ultimate PRO PC is a machine for people who want speed and power based on the very latest technology. It boasts a superb specification which already includes many of the most popular upgrade options, and now you can add an Iomega Jaz Drive as well. The ideal choice for the high-power user!

The dantum PRO for Business is an entry level system based on the Pentium® PRO processor. As its name suggests, this system has been designed with the business user in mind and comes bundled with the award-winning Lotus SmartSuite 96.

Both the dan Ultimate PRO PC and the dantum PRO/B can be purchased with pre-installed Windows 95 or Windows NT.

Iomega Zip Drives currently do not function under Windows NT. Windows NT drivers will become available in the near future

Iomega 1GB Jaz Drive

A super-fast removable hard drive that can pack up to 1GB on each cartridge. It's an ideal answer for multimedia - it can record a 2 hour movie, save 8 hours of CD quality sound, save huge graphics files and much more. The Jaz drive's speedy access times and rapid transfer rate mean you can move files around and backup a 1GB hard disk in as little as 5 minutes. There's no limit to the amount of additional cartridges you can use so it's the solution to all your storage needs.



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High-end Pentium® PRO Processor System

- 32MB EDO RAM
- Fast 2.5GB HDD
- Intel Pentium® Pro Processor with 256KB Cache Memory
- Fast Graphics card 2MB EDO RAM/64-bit
- 17" Iiyama L/R N/I Monitor (8617E)
- 12xSpeed EIDE CD-ROM
- SoundBlaster AWE32 Value 512K
- Hi-Fi Power dan Speakers (80W PMPO)
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- Midi Tower (ATX) Case w/200W PSU
- Cherry Win 95 UK Keyboard
- Windows 95 or NT (extra cost)
- 1 Parallel & 2 Fast Serial Ports
- Microsoft PS/2 Mouse
- MS Works Suite, Page Plus DTP & MS Encarta '97 US Encyclopedia



180MHz	£ 1910	£ 2245	incl. VAT
200MHz	£ 1986	£ 2334	incl. VAT

PRO Upgrade Options

200MHz CPU with 512K Cache instead of 256K	add £ 394	£ 39	incl. VAT
Windows NT 4 ws Upgrade	£ 93	£ 110	



dantum PRO/B

Ent. Level Pentium® PRO Processor System

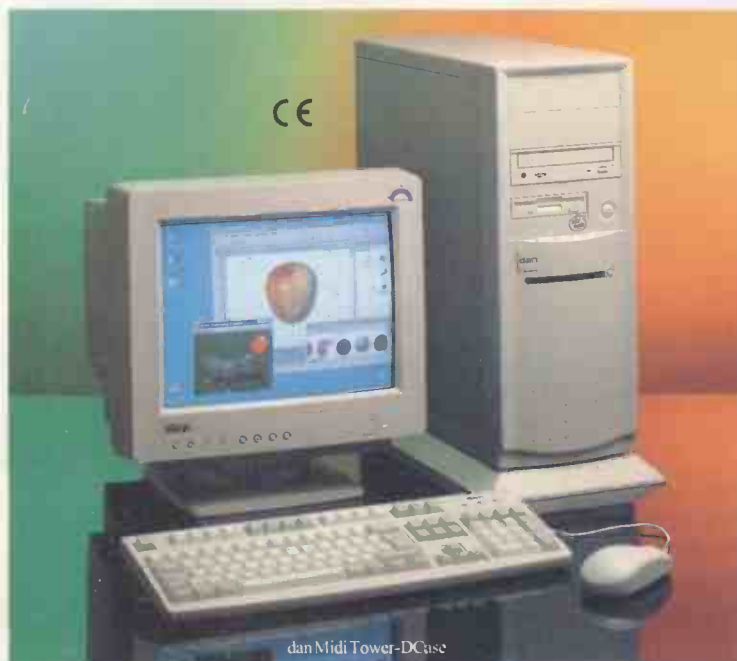
- 16MB EDO RAM
- Fast 1.2GB HDD
- Intel Pentium® Pro Processor with 256KB Cache Memory
- Fast Graphics card 1MB EDO RAM/64-bit
- 15" Super VGA L/R N/I Monitor
- 8xSpeed EIDE CD-ROM
- Free Slots: 2 PCI, 1 PCI or ISA & 2 ISA
- Fast EIDE PCI HDD Controller
- 1.44MB Floppy Disk Drive
- Midi Tower (ATX) Case w/200W PSU
- Cherry Win 95 UK Keyboard
- Windows 95 (or NT at extra cost)
- 1 Parallel & 2 Fast Serial Ports
- Microsoft PS/2 Mouse
- Lotus SmartSuite 96 & Route 66



180MHz	£ 1270	£ 1493	incl. VAT
200MHz	£ 1346	£ 1582	incl. VAT

PRO Upgrade Options

2.5GB HDD Upgrade	£ 69	£ 81	incl. VAT
32MB Memory Upgrade from 16MB	£ 57	£ 67	
28.8(33.6)KBPS fax/modem	£ 76	£ 90	
Video Card Upgrade (from 1MB EDO)			
Matrox Mystique 2MB SGRAM	£ 68	£ 80	
Matrox Millennium 2MB WRAM	£ 117	£ 137	



dan Midi Tower-DC case

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Surf the NET

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- 8x Speed CD-ROM
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- dan Advanced Speakers (10WPMPO)
- Windows 95
- 1 Parallel & 2 Fast Serial Ports
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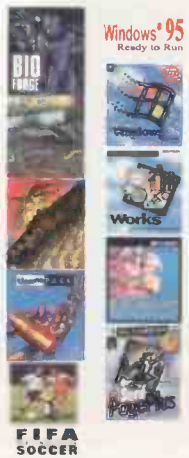
120MHz	£ 970	£ 1140	incl. VAT	£ 37.82
133MHz	£ 991	£ 1165	incl. VAT	£ 38.64
150MHz	£ 1014	£ 1192	incl. VAT	£ 39.52
166MHz	£ 1116	£ 1312	incl. VAT	£ 43.44
200MHz	£ 1272	£ 1495	incl. VAT	£ 49.42

Lower Cost Configurations also available.

- Fax Modem 28.8Kbps
- PIPEX DIAL for INTERNET
- 8x SPEED CD-ROM
- 1MB EDORAM Video Card
- 1.2GB Hard Disk
- 8MB



Desktop System with 14" Monitor



"We would be lying if we said that the dan Home Plus/133 was the fastest PC in the world, but it is certainly one of the fastest Pentium 133 machines we have ever tested. This machine speaks volumes about its components and the thought that went into its design. Add to that the fact that it is competitively priced and you end up with a PC that has much to recommend it. Overall, the dan Home Plus/133 is an excellent buy." **WHAT PC, Best Buy (dan Home Plus/133), Aug 96**

SO YOU WANT TO BUY A PC? Christmas 96 editor's choice

dan Home 133 Nov 96

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A monthly payment scheme is available to private purchasers, subject to status & proof of identity. A typical example of a payment calculation for a dan computer costing £1228 incl. VAT would be: £1228 + £18 (delivery) = £1246 total cash price, payable by 10% deposit of £124.60 followed by 36 monthly direct debit payments of £40.70 (19.9% APR). Total amount paid over 36 months will be £1589.80. Written quotations are available on request. Dan technology plc is a licensed credit broker.

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(Requires ATI Video Card with AMC connector)
This card combines TV program viewing with video recording on your PC. It enables the PC to receive TV broadcast signals directly from an aerial or cable and display a live TV program on your standard VGA monitor. You can connect it to a VCR, laser disk player or camcorder to capture images or even movie clips. These can then be saved to disk, copied to business presentations, web pages or e-mail messages.

TV on your PC & Teletext

Capture Pictures and Video Clips included as standard in dan Home PC

- In addition to the TV capability you can display teletext pages with Fast text. Additional features include:
- Full screen TV, zoom and movie clips capture.
 - Save/print capture images or teletext pages.
 - MPEG-1 Playback (30 fps, supports Video CD 2, Karaoke etc).
 - Save captured still images direct to Windows Wallpaper.
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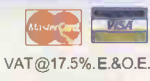
WARRANTY: All dan systems and components come with one year back-to-base parts & labour guarantee and Lifetime Hotline telephone support. Optional 8-working hour response ON-SITE maintenance (£42 for the first year). **14 DAY MONEY BACK GUARANTEE IF NOT SATISFIED** (excludes printers & Software). All software supplied on original media, except for Works & Organizer which are 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 plc terms and conditions, a copy of which may be obtained on request. All trademarks acknowledged. The Intel Inside logo & Pentium are registered trademarks of Intel Corporation.

Delivery cost to most of UK for one system is £ 15 (£ 18 inc VAT)

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Award Winning Fileservers

- 32MB RAM
- Choice of Hard Disk Drive from table
- Intel Pentium® Processor
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- Fast Graphics card 1MB EDO RAM/64-bit
- 14" Monochrome VGA Monitor
- 8x Speed EIDE CD-ROM
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- 1.44MB Floppy Disk Drive
- Full Size Tower Case w/250W PSU
- Cherry Win95 UK Keyboard
- Windows 95 or Win3.11
- 1 Parallel & 2 Fast Serial Ports
- Microsoft Serial Mouse

Pentium Processor	120	133	166	200
2.5GB	£ 972	£ 995	£1124	£1286
3.0GB	£1006	£1029	£1158	£1320
SCSI 2.10GB	£1259	£1282	£1411	£1573
SCSI 4.10GB	£1626	£1649	£1778	£1940

dantum Pro Server

Pentium® Pro Processor System

- 32MB RAM
- Choice of Hard Disk Drive from table
- Intel Pentium® Pro Processor with 256KB Cache Memory
- Fast Graphics card 2MB EDO RAM/64-bit
- 15" Super VGA L/R N/I Monitor
- 8x Speed EIDE CD-ROM
- 32-bit PCI Network Card (3COM900)
- Fast EIDE PCI HDD or Adaptec AHA-2940 PCI SCSI Controller
- Free Slots: 2 PCI, 1 PCI or ISA & 1 ISA (SCSI systems have one PCI slot less)
- 1.44MB Floppy Disk Drive
- ATX Midi Tower Case w/200W PSU
- Cherry Win95 UK Keyboard
- Windows 95 or Win3.11 or Windows NT (extra cost)
- 1 Parallel & 2 Fast Serial Ports
- Microsoft Serial Mouse

Pentium Pro Processor	180	200	200 ^{512KB Cache}
2.5GB	£1509	£1587	£1997
3.0GB	£1543	£1621	£2031
2.10GB SCSI	£1796	£1874	£2284
4.10GB SCSI	£2163	£2241	£2651

dantum Pro Duo Server

Dual Pentium® Pro Processor System

- 64MB RAM
- Choice of Hard Disk Drive from table
- Choice of one or two Intel Pentium® Pro Processors installed with 256KB Cache
- Fast Graphics card 2MB EDO RAM/64-bit
- 15" Super VGA L/R N/I Monitor
- 8x Speed EIDE CD-ROM
- 32-bit PCI Network Card (3COM900)
- Adaptec AHA-2940 PCI SCSI Controller
- Free Slots: 1 PCI, 1 PCI or ISA & 1 ISA
- 1.44MB Floppy Disk Drive
- Full Tower Case w/250W PSU
- Cherry Win95 UK Keyboard
- Windows NT3.51 or 4.0 Workstation
- 1 Parallel & 2 Fast Serial Ports
- Microsoft Serial Mouse

SCSI or Wide SCSI option

Call for Windows NT4 Server Upgrade

Pentium Pro Processor	with one CPU		with two CPUs	
	200	200	200	200
2.10GB SCSI	£2294	£2716	£2661	£3083
4.10GB SCSI	£2607	£3029	£3018	£3440

For Novell Netware File Servers you must upgrade the EIDE CD-ROM to an 8xSpeed SCSI add £ 34 (plus £ 187 for SCSI controller if needed - Adaptec AHA 2940)



Network Workstations



All dan PCs can be used as workstations by just adding a network card. The most popular card is the 16-bit Ethernet Novell NE2000 compatible. However the 3COM 509 or the PCI card can give higher performance.

Example of Workstations:

Entry level Station
dantumValue/120sWS
dantum Value/120s £ 661
16-bit Ethernet card £ 21
Workstations price £ 682

Best Seller Station
dantum/133sWS
dantum/133s £ 862
3COM509 card £ 62
Workstations price £ 924

Power User Station
dantum95/166sWS
dantum95/166s £ 1194
PCI Ethernet card £ 70
Workstations price £ 1264

Network Upgrades

All prices exclude VAT

Miscellaneous

16MB Additional Memory Upgrade	£ 57
32MB Additional Memory Upgrade	£ 114
8x Speed SCSI CD-ROM w/o Controller	£ 104
14" Colour Monitor from 14" Mono	£ 74
Uninterruptible Power Supplies - UPS	
600VA UPS Line Interactive (Fiskars)	£ 255
800VA UPS ON-Line (Fiskars)	£ 642
1000VA UPS Line Interactive (Fiskars)	£ 422
Tape Streamers	
(Controller, Tapes & Backup Software not included)	
2GB DAT Tape Streamer for Server	£ 420
4GB DAT Tape Streamer for Server	£ 471
8GB DAT Tape Streamer for Server	£ 668

Network Cards

16-Bit Network Card Ethernet (Novell NE2000 Compatible - Thin Ethernet & Twisted Pair)	£ 21
16-Bit Network Card Ethernet (3COM 509)	£ 62
32-bit PCI Ethernet Card (3COM 900)	£ 70
32-bit PCI 100Mbps base-T Ethernet Card (3COM 905)	£ 71
4 Port 32-bit PCI Cogent Ethernet Card	£444
8 Port 10 base-T Mini Ethernet Hub	£ 37
16 Port 10 base-T Mini Ethernet Hub	£ 84

Delivery cost to most of UK for one system is £15.



CE

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LEEDS: There is no showroom available at our Leeds Office. FAX: 0113-239 0652

Opening Hours / London Showroom: Mon-Fri 10am-6pm



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Memory



72-pin Modules

4MB Memory Module with Parity	£ 21 (25)
4MB Memory Module EDO RAM	£ 15 (18)
8MB Memory Module with Parity	£ 40 (47)
8MB Memory Module EDO RAM	£ 29 (35)
16MB Memory Module with Parity	£ 74 (87)
16MB Memory Module EDO RAM	£ 57 (67)
32MB Memory Module EDO RAM	£ 114 (134)

30-pin Modules

1MB Memory Module with Parity	£ 9 (11)
4MB Memory Module with Parity	£ 25 (30)

RAM Prices are subject to change. Call for latest prices.

Video Cards



PCI 64-bit 1MB EDO RAM Video Card	£ 30 (36)
PCI 64-bit 2MB EDO RAM Video Card	£ 38 (45)
PCI 64-bit 2MB Xpression SDRAM Video Card	£ 48 (57)
PCI 2MB Mystique SGRAM Video Card	£ 98 (116)

Fax/Modems



Internal 14.4KBPS FAX/Modem	£ 42 (50)
Internal 33.6KBPS FAX/Modem	£ 76 (90)
External 33.6KBPS FAX/Modem	£ 75 (89)
US Robotics Sportster Voice External	
28.8/33.6 dataKBPS FAX/Modem	£ 166 (196)
Internal US Robotics 33.6KBPS FAX/Modem	£ 166 (196)

All modems are BABT Approved

CPUs/Motherboards



CPUs

Pentium 120MHz	£ 83 (98)
Pentium 133MHz	£ 104 (123)
Pentium 150MHz	£ 127 (150)
Pentium 166MHz	£ 229 (270)
Pentium 200MHz	£ 385 (453)

Motherboards

PCI Pentium VX w/256K Pipeline Cache	£ 86 (102)
PCI Pentium HX w/256K Pipeline Cache	£ 94 (111)
PCI Pentium VX w/512K Pipeline Cache	£ 94 (111)
PCI Pentium HX w/512K Pipeline Cache	£ 103 (122)
PCI Pentium Pro Intel Natoma	£ 193 (227)

Hard Disk Drives



850 MB EIDE	£ 102 (120)
1.2 GB EIDE	£ 118 (139)
1.6 GB EIDE	£ 134 (158)
2.5 GB EIDE	£ 187 (220)
3.0 GB EIDE	£ 220 (259)
2.1 GB SCSI	£ 276 (325)
4.0 GB SCSI	£ 629 (740)
9.0 GB SCSI	£ 1510 (1775)
2.13 GB Wide SCSI	£ 407 (479)
4.0 GB Wide SCSI	£ 803 (944)

Hard disk drives with capacity greater than 525MB require systems with BIOS that support LBA or other translation mechanism or the use of a special controller like the VESA Local BUS Promise 2300Plus.

Adaptec PCI 2940 SCSI controller	£ 187 (220)
Promise VESA 2300plus EIDE controller	£ 42 (50)
Removable Hard Disk Drive Kit	£ 17 (20)

Input Devices



Cherry Keyboard for Windows 95	£ 14 (17)
Microsoft Natural Keyboard	£ 39 (46)
Joystick	£ 17 (20)

The Company



Tel: 0181 830 2492

FAX: 0181 830 1103

Opening Hours: Mon-Fri 10am-6pm

Network (Thin Ethernet)



Ethernet Network Card (BNC & 10-base-T)	£ 21 (25)
ISA 3-COM Etherlink III (3C509) Network Card	£ 62 (73)
8-port 10 base-T mini Ethernet Hub	£ 37 (44)
16-port 10 base-T mini Ethernet Hub	£ 84 (99)

Multimedia Devices



8x Speed IDE CD-ROM	£ 70 (83)
8x Speed SCSI CD-ROM	£ 104 (123)
Sound Blaster AWE (full package)	£ 150 (177)
dp Hi-Fi Power Speakers 80W (PMPO)	£ 19 (23)

Prices in brackets include VAT @ 17.5% E.&O.E.

Backup Devices



IOmega 2GB Floppy Tape Streamer + tape	£ 95 (112)
IOmega 3200 Floppy Tape Streamer + tape	£ 126 (149)
IOmega 100MB ZIP External Parallel Drive	£ 128 (151)
IOmega 100MB ZIP Internal IDE Drive + cart.	£ 85 (100)
IOmega 100MB ZIP Cartridge	£ 10 (12)
IOmega 1GB JAZ Internal SCSI Drive	£ 245 (288)
IOmega 1GB JAZ Cartridge	£ 61 (72)
HP 2GB DAT Tape Streamer	£ 420 (494)
HP 4GB DAT Tape Streamer	£ 471 (554)
HP 8GB DAT Tape Streamer	£ 668 (785)

The Jaz Drive & DAT Tape Streamers require SCSI Controller & backup software. Under Windows use ArcSolo SCSI backup software. No tapes supplied.

Adaptec AHA-1515 SCSI 16-bit Controller for SCSI Tape Streamers & Jaz £ 64 (76)

dp Multimedia Kits



dp Multimedia Kit £ 169 (199)

16-bit Sound Card
8x Speed CD-ROM
dp Advanced 10W (PMPO)
Speakers with Microphone
Microsoft Encarta '97 US
Page Plus DTP (Home/Office)



Plus MM Software Pack 1

Quicken 5, 500 Nations, Dangerous Creatures, Dinosaurs 1, Dogs, Musical Instruments 1, Multi-Ed, Golf & World of Flight.

Or MM Software Pack 2

Quicken 5, Cinemania 97, Art Gallery & Golf 8.0.

The Panasonic PD



A 4x speed CD-ROM & a 650MB read-write optical Disk Drive in one unit with controller and one 650MB cartridge £ 300 (353)
650MB extra Cartridge £ 26 (31)

Monitors



3 YEAR ON-SITE WARRANTY for iiyama monitors only

14" VGA Mono Monitor £ 74 (87)

14" FST SVGA Colour Monitor Shadow Mask, .28dot, 72KHz 800x600 maximum resolution £ 140 (165)

15" FST SVGA Colour Monitor FST Shadow Mask, .28dot, 72KHz 1024x768 maximum resolution £ 218 (257)

15" SONY CPD-15SF2 SVGA Colour Monitor Digital Multiscan technology, Trinitron Tube, .25dot, 80KHz 1024x768 maximum resolution £ 355 (418)



17" iiyama 8617E SVGA Colour Monitor FST Tube, .26dot, 86KHz 1600x1200 maximum resolution £ 489 (575)

17" iiyama 9017E SVGA Colour Monitor The best 17" monitor on the market £ 520 (611)

21" iiyama 9021E SVGA Colour Monitor Diamond Tron Tube, .30dot, 92KHz 1600x1200 maximum resolution £ 965 (1134)

TV & Teletext Card



Watch TV & Teletext on your PC with the NEW ATI Video Xpression 2MB SDRAM and ISA Tuner Card



Perfecting the PC

This card combines TV program viewing with video recording on your PC. It enables the PC to receive TV broadcast signals directly from an aerial or cable and display a live TV program on your standard VGA monitor. You can connect it to a VCR, laser disk player or camcorder to capture and save images or movie clips, for use in other applications. In addition you can also display Teletext pages with Fast text.

Other features include:

- Full screen TV, zoom functions.
- MPEG-1 playback (30fps - for Video CD2, Karaoke, etc.)
- Save or print capture images or teletext images, or even use them as Windows wallpaper.

£ 112 (133)



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10. Is the supplier reputable? Do they comply with BS5750 or ISO900? If in doubt, ask to see customer testimonials.



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PC Direct

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The AJP manages to pack quite a punch into a case little larger than an ordinary notebook, including the fastest processor currently in the standard Pentium line-up and a 1.3Gb hard disk. Other attractive features include a dual-scan display capable of an 800x600 resolution and an integral CD-Rom drive.

FEBRUARY 1996

AJP 5400

• Built-in eight speed CD-ROM drive to enjoy the world of multimedia

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• User removable/ interchangeable "pocket-size" 1.4 GB hard disk upgradeable up to 2.1 GB capacity

AJP 5400 1.4 GB HDD 16 MB EDO RAM	AJP 54-150 Pentium 150MHz chip £ ex.VAT £ inc. VAT	AJP 54-166 Pentium 166MHz chip £ ex.VAT £ inc. VAT
Dual Scan (11.3") Colour	£1199.00 £1408.83	£1299.00 £1526.33
TFT Active (10.4") Colour	£1325.00 £1556.88	£1425.00 £1674.38
TFT Active (12.1") Colour	£1675.00 £1968.13	£1775.00 £2085.63

AJP 6200 1.4 GB HDD 32 MB EDO RAM	AJP 62-150 Pentium 150MHz chip £ ex.VAT £ inc. VAT	AJP 62-166 Pentium 166MHz chip £ ex.VAT £ inc. VAT	AJP 62-200 Pentium 200MHz chip £ ex.VAT £ inc. VAT
Dual Scan (12.1")	£1449.00 £1702.58	£1549.00 £1820.08	£1649.00 £1937.58
TFT Active (10.4")	£1549.00 £1820.08	£1649.00 £1937.58	£1749.00 £2055.08
TFT Active (12.1")	£1899.00 £2231.33	£1999.00 £2348.83	£2099.00 £2466.33

Add-ons

	Exc. VAT. £	Inc. VAT. £
Upgrades RAM per MB.....	10.00.....	11.75
Upgrade HDD from 1.4 GB to 2.1GB*	249.00.....	292.58
Additional 1.4GB HDD.....	199.00.....	233.83
HDD Housing Kit.....	39.00.....	45.83
PCMCIA Ethernet Card(BNC & 10BT).....	99.00.....	116.33
PCMCIA Fax/Modem (28,800bps).....	175.00.....	205.63
PCMCIA Fax/Modem (GSM/PSTN).....	339.00.....	398.33
MS Windows 95.....	69.00.....	81.08
6200 Internal Duracell Battery.....	85.00.....	99.88
6200 Battery Charger.....	69.00.....	81.08
6200 Port Replicator.....	95.00.....	111.63
5400 Heavy Duty External Battery.....	125.00.....	146.88
5400 Internal Battery Charger.....	69.00.....	81.08
5400 Docking Station.....	195.00.....	229.13

*Initial Sales Only.

All systems come supplied with an AC/DC adaptor, digital manual, drivers and carrying case. (weight 3.5kg) Size: 300mm(W) 228mm(D) 54(H)

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All AJP notebooks are supplied with 12 months R.T.B parts and labour warranty. AJP can also offer optional cover to provide you with up to "3 Years Warranty" and/or up to "3 years All Risks" cover on your purchase. This cover is arranged by CPU Finance underwritten and approved by certain underwriters at Lloyd's and Sorema UK. For a nominal fee, you can now ensure peace of mind. Extended Warranty provides for any electrical, electronic or mechanical breakdown fault or failure of your equipment. All Risks cover provides for any accidental loss or damage including theft to your equipment whilst anywhere in Europe. With this cover in place you are free from any unforeseen and costly circumstances.

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- Infra red transfer port. provides IrDA and FIR compliant wireless communications.

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- Built-in eight speed CD ROM drive.

- Ergonomically designed two button track pad, and wrist rest.

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AJP 6200



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- Supplied as standard with hardware MPEG accelerator card, 2MB EDO Video RAM & 64-bit video adaptor.



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SCENIC MOBILE 300

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Model	CPU	Ram	Hard Disk	Display	CD-ROM	RRP	MPC Price	
							Ex-Vat	Inc. VAT
300CS	Pentium 100MHz	8MB EDO	810MB	11.3" SVGA DS	Optional CD	£1577	£1169	£1373.57
300CT	Pentium 100MHz	8MB EDO	810MB	11.3" SVGA TFT	Optional CD	£1985	£1499	£1761.32
300CTE	Pentium 133MHz	8MB EDO	1.35GB	11.3" SVGA TFT	Optional CD	£2325	£1799	£2113.83
300CDS	Pentium 100MHz	8MB EDO	810MB	11.3" SVGA DS	6x CDROM	£1781	£1339	£1573.33
300CDT	Pentium 100MHz	8MB EDO	810MB	11.3" SVGA TFT	6x CDROM	£2099	£1699	£1996.32
300CDTE	Pentium 133MHz	8MB EDO	1.35GB	11.3" SVGA TFT	6x CDROM	£2487	£1999	£2348.83

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- All Siemens Nixdorf products are produced to the highest environmental standards.
- All SCENIC Mobile notebooks are manufactured by Siemens in Augsburg, Germany.

SCENIC Mobile 500



SCENIC MOBILE 500

A lightweight modular multimedia notebook for people on the move. The SCENIC Mobile 500 offers modular computing with upgradeable processor, hard disk and the full-features of a desktop with the MobiDock expansion options

Model	CPU	Ram	Hard Disk	Display	Ex-Vat	Inc. VAT
SMS100	Pentium 100MHz	8MB EDO	840MB	11.3" SVGA DS	£1599	£1878.82
SMS100E	Pentium 100MHz	16MB EDO	840MB	11.3" SVGA TFT	£2069	£2431.07
SMS133	Pentium 133MHz	8MB EDO	1.35GB	11.3" SVGA TFT	£2139	£2513.32
SMS133E	Pentium 133MHz	16MB EDO	1.35GB	11.3" SVGA TFT	£2269	£2666.07
SMS150M	Pentium 150MHz	16MB EDO	1.35GB	11.3" SVGA TFT	£2539	£2983.32
SMS166M	Pentium 166MHz	16MB EDO	1.35GB	11.3" SVGA TFT	£2639	£3100.82

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PC Magazine DEC 96

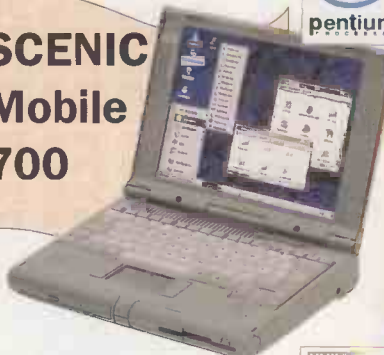
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PC PRO JAN 97

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PC Direct Feb 97

SCENIC Mobile 700



SCENIC MOBILE 700

A modular high-end multimedia notebook offering complete flexibility as well as ability to expand. Two magic-bays allow use of CD-ROM and floppy drive or 2 battery packs! Type II and Type III PCMCIA slots, MIDI interface & full screen MPEG video playback are some of the innovative features

Model	CPU	Ram	Hard Disk	Display	CD-ROM	Ex-Vat	Inc. VAT
SM7133CD	Pentium 133MHz	16MB	1.35GB	11.3" SVGA TFT	8x CDROM	£2449	£2877.57
SM7133CDE	Pentium 133MHz	16MB	1.35GB	12.1" SVGA TFT	8x CDROM	£2899	£2406.32
SM7133CDX	Pentium 133MHz	16MB	2.1GB	12.1" SVGA TFT	8x CDROM	£3059	£3594.32
SM7150CDX	Pentium 150MHz	16MB	2.1GB	12.1" SVGA TFT	8x CDROM	£3249	£3817.57
SM7150M-CDX	Pentium 150MHz	24MB	2.1GB	12.1" SVGA TFT	8x CDROM	£3399	£3993.82
SM7166M-CDX	Pentium 166MHz	24MB	2.1GB	12.1" SVGA TFT	8x CDROM	£3519	£4134.82

700 Pro-View



SCENIC MOBILE 700 PRO-VIEW

The Mobile 700 Pro-View offers the features benefits and functionality of the Mobile 700 but with a 12.1" SVGA TFT removeable display that acts as an OHP panel for professional presentations

Model	CPU	Ram	Hard Disk	Display	CD-ROM	Ex-Vat	Inc. VAT
SM7133CDEP	Pentium 133MHz	16MB	1.35GB	OHP - 12.1" TFT	8x CDROM	£3279	£3852.82
SM7133CDXP	Pentium 133MHz	16MB	2.1GB	OHP - 12.1" TFT	8x CDROM	£3449	£4052.57
SM7150CDXP	Pentium 150MHz	16MB	2.1GB	OHP - 12.1" TFT	8x CDROM	£3649	£4287.57
SM7150MCDXP	Pentium 150MHz	24MB	2.1GB	OHP - 12.1" TFT	8x CDROM	£3799	£4463.82
SM7166MCDXP	Pentium 166MHz	24MB	2.1GB	OHP - 12.1" TFT	8x CDROM	£3929	£4616.57

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- TM 6030** Intel Pentium 133MHz 12.1" SVGA TFT 2MB VRAM 16MB EDO RAM(Max 72MB RAM) 1.35GB HDD Multimedia ready 6 x CD ROM **£2399 (£2818.83)**
- TM 6050** Intel Pentium 150MHz 12.1" SVGA TFT 2MB VRAM 16MB EDO RAM(Max 72MB RAM) 1.35GB HDD Multimedia ready 6 x CD ROM **£2699 (£3717.32)**



EXTENSA 600 SERIES

EXTENSA 600

Model	CPU	Ram	Hard Disk	Display	CD-ROM	Ex-Vat	Inc. VAT
EXT 600	Pentium 120MHz	8MB	810MB	10.4" VGA DS	Optional CD	£999	£1173.83
EXT 600CD	Pentium 120MHz	8MB	810MB	12.1" SVGA DS	6x CDROM	£1199	£1408.83
EXT 650CD	Pentium 133MHz	16MB	1.2GB	12.1" SVGA DS	10x CDROM	£1599	£1878.83
EXT 650CDT	Pentium 133MHz	16MB	1.44GB	11.3" SVGA TFT	10x CDROM	£2199	£2583.83

EXTENSA 900

The ultra-lightweight Extensa for people on the move. The mobile productivity base converts the Extensa 900 into a full featured notebook.

Model	CPU	Ram	Hard Disk	Display	CD-ROM	Ex-Vat	Inc. VAT
EXT 900	Pentium 133MHz	16MB	1.35GB	12.1" SVGA DS	Optional CD	£1949	£2290.08
EXT 900T	Pentium 133MHz	16MB	1.35GB	11.3" SVGA TFT	Optional CD	£2239	£2630.83
EXT 900CDT	Pentium 133MHz	16MB	1.35GB	11.3" SVGA TFT	8x CDROM	£2629	£3089.08



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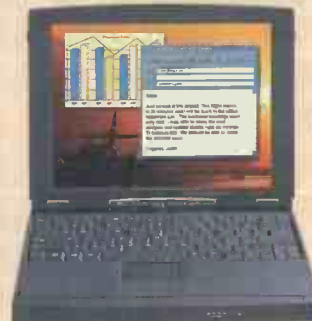
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- PCL4 emulation for MS-Dos printing
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- Straight paper path + 200 Sheet tray
- Optional interface for networking



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- Windows 3.1 and '95 compatible



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- PCL4e emulation for MS-Dos printing
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- Optional interface for networking



OKI OL610ex £289

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- High performance RISC processor
- 600 dpi with MicroRes 600
- 45 scalable fonts
- PCL 5e and Windows GDI emulations
- 2Mb memory (user upgrade to 19Mb)



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- 1200x600dpi
- Postscript Level 2 & PCL5e emulation
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- Networking Models available
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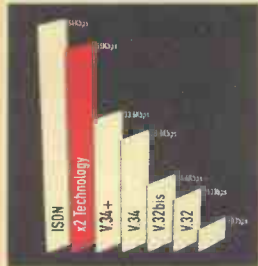
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Call for other Kingston Hubs Prices

Network Cables

Length (metres):	1m	3m	5m	10m
BNC	£4	£6	£9	£15
Cat 5 RJ45	£5	£6	£10	£19

Other Drives

Omega

ZIP Drive 100Mb Ext Parallel	£108
ZIP Drive 100Mb Int SCSI	£108
ZIP Drive 100Mb Ext SCSI	£108
JAZ Drive 1Gb Internal SCSI	£319
JAZ Drive 1Gb External SCSI	£319

Panasonic PD Drives

LF 1004B Bear Internal	£285
LF 1004BK Internal + SCSI	£325
LF 1000HB External	£379
LF 1000HBK External + SCSI	£415

SysQuest

EZ Flyer 230Mb External SCSI	£169
EZ Flyer 230Mb External Parallel	£169

All Sysquest EZ drives supplied with one Cartridge

Xyratex

MaxIT SCSI (blue or yellow)	£219
MaxIT Parallel (blue or yellow)	£269

UPS

APC BackUPS Pro

280 PNP inc PowerChute Pro	£105
420 PNP inc PowerChute Pro	£149
650 PNP inc PowerChute Pro	£189
1000	£289
1400	£374

Smart UPS

405i	£209
700i	£225
1000i	£339
1400i	£449
2200i	£738

← See feature (left)

ORDER Information

Prices
Business user Prices shown (ex VAT)
Please add VAT at 17.5%.
(ie £100 item + £10 delivery +
£19.25 VAT = £129.25)
Prices may fluctuate - Please call
before ordering - Its FREE !

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Monday - Friday 9am to 5.30pm.
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directions and map see final page.



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Goods are not supplied on a trial basis. You
must check specifications and compatibilities
with manufacturers before buying.
Specifications may change without notice.
Goods are offered subject
to our standard conditions of sale - available
on request. E & OE. Partners DRM & J Furby

Warranty & Support
In addition to any manufacturers warranty
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covered by our own 12 month return to
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a 90 day warranty. Should you have a
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Turn your Monitor into a TV!

Aims Lab Instant TV £99

- High Quality TV / Video in all display resolutions
- Remote control included
- Full screen display
- No PC power on required
- Brightness / Contrast / Saturation control
- Stereo audio input / output
- Optional interface sound card

Aims Lab's Instant TV turns your monitor into a digital TV instantly!

When you're not working, make use of that expensive PC monitor at home, by it turning into a spare TV. Saves money, and arguments...about what to watch!



Use it at work to check up on the latest sports scores, or your favourite soap... when the boss is not watching of course! Well, you know what they say about all work and no play... This excellent product allows you to do both!



“The value-for-money that it offers is almost unbelievable.”

£129

COMPUTER SHOPPER Nov '98 Issue
 “An easy winner of our Best Budget Buy award.”



EVEN LOWER PRICE!

These rave reviews were based on a price of £169! Every price reduction we get, we pass onto you.



“For the ultimate in budget scanners, ScanTak-2c takes the prize”

PC DIRECT Jan '97 Issue

ScanTak-2c 24-Bit A4 Colour Scanner £129

The ScanTak-2c is not only a “Best Buy”.

It's a best-seller... and it is not difficult to see why – Superb value package with Scantastic™ software incorporating sophisticated image manipulation and Omnipage OCR from Caere.

SPOT
 The Most Advanced Graphics
www.spot.com.tw

Single Pass, 24-Bit Colour Scanner

RESOLUTION	300 X 600 dpi
INTERPOLATED	2,400 x 2,400
MODES	Colour, Greyscale, B/W
24-BIT COLOUR	16.7 Million
8-BIT GREYSCALE	256 Shades
MAX SCAN AREA	216 x 297mm
DIMENSIONS	488 x 297 x 56mm
WEIGHT	3.5 KG
PRICE	£129 ex VAT

SCANTASTIC SOFTWARE INCLUDES:

Interactive PreScan Window	Colour and B/W
Batch Scan	Scan more than one window
Downloadable Gamma Correction	Gamma value
Shadow / Highlight	B or W point setting
Zoom In / Out PreScan	Real Time Flip / Invert
Optical Character Recognition	Image Editing
Business Card Reader	Colour Matching
Scan to E-mail	Colour Copy
Fax Enhancement	Slide Show
Digital Copy	Photo Album
Auto Image Enhancement	Magic Morphing

SYSTEM REQUIREMENTS

IBM PC 486	8Mb RAM
MS-DOS 8.0	Windows 3.1x, 95



Award winning Monitor

- .26mm dp tube
- 1280 x 1024 NI
- OSD Menu
- MPRII

iyama
Vision Master 17E £489



Sharp & Brilliant!

- Acer Revolving Optical System optimizes colour spectrum
- Friendly TWAIN compliant driver Win 3.1, Win 95 & Mac
- Built-in SCSI interface & Plug & Run interface card

Acerscan 300F £189



Pocket size Power

Have your PC information at hand – wherever you are. Addresses, diary, memopad, to-do list and calculator all in one compact unit. Your Pilot and PC are in sync within seconds and information is transferred in either direction.

- Notes
- Alarm
- Addresses
- Appointments
- Small pocket size
- Less than 6 ounces

Robotics
The Intelligent Choice in Information Access

Pilot 5000 £179

The quickest ways to get images into your PC...

- Light weight and pocket portable
- Unique built-in colour LCD screen
- 96 image memory
- Connect to PC or MAC, or TV / VCR



CASIO QV-10A Digital Camera £278



Single-Pass, 24-Bit Colour Scanner

RESOLUTION 600 x 1200 dpi

MODES Colour, Greyscale, B/W

24-BIT COLOUR 16.7 Million

8-BIT GREYSCALE 256 Shades

MAX SCAN AREA 178 x 127mm

DIMENSIONS 330 x 188 x 46mm

WEIGHT 1.5 KG

PRICE £109 ex VAT

TRANSPARENCY UNIT £49 ex VAT

SCANTASTIC SOFTWARE INCLUDES:

*Net Web Publisher Metatools - Kai's Power Goo
Micrografs - Greeting Card - Windows Draw
Scan-on-T-Shirt Program Scan to Puzzle Game

SYSTEM REQUIREMENTS

IBM PC 486 8Mb RAM
MS-DOS 6.0 Windows 3.1x, 95

“You won't find a better way to scan A5 images in colour”

Perfect for web page images, family photos and any image A5 size or smaller. After all, how often do you scan entire images?

FotoTak-6 £109

Monitors

Novatech

14"	£135
15"	£179
17"	£319
21"	£759

iyama

Vision Master 15	£249
Vision Master 17E	£489
Vision Master 17ES	£499
Vision Master Pro 17	£549
Vision Master 21	£959
Vision Master Pro 21	£999

Philips

14" 1024x768 I LR	£155
15C 15" 1024x768 NI LR	£209
20C 20" 1280x1024 NI LR	£679

Sony

CPD-100SX	£246
CPD-100SFT	£299
CPD-200SX	£435
CPD200SFT	£504
CPD-300SFT5	£960

TV Tuners

◀ Aims Lab Instant TV *New!* £99

Graphics Cards

Diamond Stealth 64 PCI Oem

64 2120 1Mb DRAM	£42
64 Video 2121 1Mb DRAM	£45
64 Video 2520 2Mb DRAM	£49
Monster 3D	£155

Diamond 3D PCI

2240 2Mb EDO	£70
2400 4Mb EDO	£85
3240 2Mb VRAM	£125
3400 4Mb VRAM	£157
Win TV PCI Premiere	£49

Hauppauge Retail

Win TV PCI	£77
Win TV Cinema Pro Windows 95	£205
Video Magic	£211

Matrox PCI Oem Retail

Millennium 2Mb	£98	£115
Millennium 4Mb	£137	£155
Mystique 2Mb	£75	£95
Mystique 4Mb	£92	£135

Novatech

S3 3D Virage MPeg 2mb PCI	£59
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Video Logic

Apocalypse 3D PCI	£127
GrafixStar 400 2Mb PCI	£50
GrafixStar 600 2Mb PCI	£89

Scanners

Acer

Acerscan 300F	£189
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Agfa Colour Scanners

SnapScan	£235
StudioScan II SI Adobe PhotoShop LE	£389
StudioScan II SI Full PhotoShop 3	£457
StudioStar Adobe PhotoShop LE	£548
Arcus II Full Adobe PhotoShop	£1289
DuoScan Full Adobe PhotoShop	£2700

Epson

	PC Para	PC Scsi	Mac
GTX5000	£243	£295	£246
GTX8500	£402	£430	£406
GTX9500	£524	£548	£524
GTI8500		£514	£514
GTI9500		£622	£634

Hewlett Packard

ScanJet 4S Portable Mono	£158
ScanJet 4P Flatbed Colour	£286
ScanJet 4C Flatbed Colour	£589

Logitech

Pro2000	£71
Pagescan Colour	£139
Pagescan +ADF	£159

Spot

FotoTak 6 A5 Colour Flatbed	£109
ScanTak 2C A4 Colour Flatbed	£129

Visioneer

Paperport VX Windows Mono	£209
Paperport IX Keyboard Mono	£209

Cameras

Agfa ephoto £315

Casio

QV10A 320x200	£278
QV100 640x480	£419
QG100 Thermal Colour Printer	£169

Canon Powershot 600 £629

Epson Photo PC 500 £309

Kodak

DC20	£136
DC25 LCD	£295
DC50	£559

Palmtops

Pision

Series 3c 1Mb <i>New!</i>	£259
Series 3c 2Mb <i>New!</i>	£319

U.S. Robotics

Pilot 1000	£154
Pilot 5000	£179

◀ = See feature (left)

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(ie £100 item + £10 delivery +
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Terms & Conditions
Goods are not supplied on a trial basis. You must check specifications and compatibilities with manufacturers before buying. Specifications may change without notice. Goods are offered subject to our standard conditions of sale – available on request. E & OE. Partners DRM & J Purby

Warranty & Support
In addition to any manufacturers warranty supplied, all the products we sell are covered by our own 12 month return to base warranty. Consumables are covered by a 90 day warranty. Should you have a problem our dedicated after sales team will be waiting to help – Call 01705 662299

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Making Memory Easy...



This page is PC memory. Find the type of memory for your PC, or call our experts for help – It's FREE !

AMSTRAD

- 7 Series
- 9 Series

APPLE

- Quadra 700,900,950
- Performa 200,410,430
- Quadra 610,650,800,840
- LC475,LC550,LC630
- PowerMac 6100,7100
- Performa 5200,5300
- Performa 6200

AST

- Bravo LC,LRMS,MT
- Premmia 486

COMPAQ

- ProLinea 4/25.
- 4/33,4/33s.
- 4/50,4/66,MT,P75
- Presario all models

COLOSUS

- P75,P90,P100,P120
- P133,P150,P166

DAN

- 95s,Premium,
- Home, Home +
- Dantum, Dantum Pro
- Ultimate, Ultimate +

DELL

- Dimension XPS Pro 180n
- Dimension P133v
- Performance L,M,T
- Precision 486
- Precision Pentium
- Omniplex, Optiplex
- XPS Pentium
- XPS P200s,P166s

ELONEX

- PC433,450,466
- PC500, PC560

ESCOM

- DX2,P60,P75,P100

EVESHAM

- Vale Prima
- Vale Prestige
- Platinum
- Proline

GATEWAY

- PC4sx33,DX33v,
- 66v,P/V,
- P4D
- P575,90,100,120,
- 133 EDO, 133 Elite
- P5 Range
- G6 Range

HIGHMEAD

- DX2/66,DX4/100
- P75,P90,P100

ICL

- Ergo Pro

HEWLETT PACKARD

- Vectra/Netserver
- LF/LM
- N2,M2,XM2,VL2

IBM

- Aptiva 300 Series
- 700 Series
- Valuepoint
- PS/2

MITAC

- DX2/66,DX4/100,
- P60

MJN

- DX2/66,DX4/100,
- 100,P75,P100, P120
- P133

OPUS

- DX2/66,DX4/100,
- Prelude
- Premier,Prestige
- Triton

PACKARD BELL

- 386, 486sx
- 486DX

SIMPLY

- DX2,DX4,P60,75,90
- Windows 95
- Office 95

VIGLEN

- Genie 486, Contender
- Pentium EX
- Pentium EDO
- Power 100
- Ultimate 120,133
- Genie PCI

Decide how much more memory you need – Remember if you have a Pentium PC you need to upgrade in pairs (eg. for 16Mb you need 2 x 8Mb modules)

Memory Type / Size	1Mb	4Mb	8Mb	16Mb	32Mb
30 Pin	£8	£19	–	–	–
72 Pin Parity	–	£21	£38	£66	£129
72 Pin Non Parity	–	£12	£23	£48	£99
72 Pin EDO 60ns	–	£12	£22	£48	£98
168 Pin SD Ram	–	–	–	£65	£135

Prices may be subject to fluctuation. Call to check - it's free.

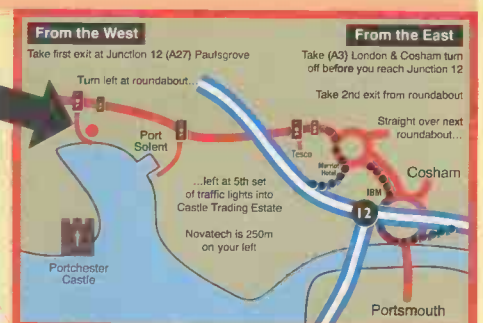
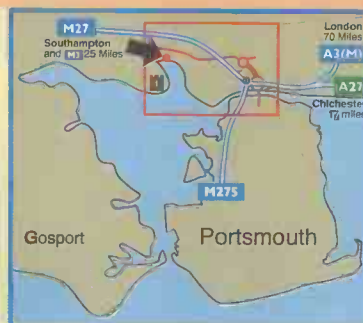
We are so confident in the quality and reliability of our memory we will give you a 5 year exchange warranty



If you are not entirely satisfied with our memory simply return it to us within 14 days for a full refund (less carriage charges)

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...to our own brand new freehold custom designed and built offices / warehouse at the top of Portsmouth Harbour.



Personal collections are welcome. We hold large stocks but unfortunately we do not have any demonstration facilities. Open: Mon - Fri 9am - 5.30pm. Sat 9am - 4pm.

This page is for notebook memory. Find your Notebook, or call our experts for help if its not listed - Its FREE !

	4Mb	8Mb	16Mb	32Mb		4Mb	8Mb	16Mb	32Mb
Acer					IBM				
Acernote 760i,780i,900i,900i,350i,350i,355	●	●	●		Thinkpad 701,230C,230CS	●	●	●	●
AST					ThinkPad 700, 700C, 720,720C	●	●	●	●
Ascentia 700, Bravo Notebook	●	●	●		ThinkPad 730T,730TE,345C,345CS,355,360	●	●	●	●
Ascentia 800N 4/33, 4/50	●	●	●		ThinkPad 750,755,370C	●	●	●	●
Ascentia 900N 4/50, 4/75	●	●	●		ThinkPad 760C,760CD,760L,760LD	●	●	●	●
Ascentia 950N	●	●	●		ThinkPad 760EX,760ED,760EL,365X,365XD,560,535	●	●	●	●
Ascentia A Series, Ascentia J Series	●	●	●	●	NEC				
Ascentia P Series	●	●	●	●	UltraLite Versa, Versa E, M, P, V 4000 P75	●	●	●	●
Power Exec 4/25SL Colour	●	●	●		Versa 4050 P90, Versa 4050H, 6000	●	●	●	●
COMPAQ					Versa 5,2000	●	●	●	●
LTE Lite 4/25C/33C/25E/25SL Mono Notebk	●	●	●		OLIVETTI				
LTE Elite 4/40C, /50E, /40CX, /50CX, /75CX	●	●	●		Echos Pentium series	●	●	●	●
LTE S000Series 5000P75,5100P90,5200 P120	●	●	●	●	PANASONIC				
Concerto 4/25, 4/33	●	●	●		CF21PCF41 mklI, mklII, Pentium	●	●	●	●
Contura 4/25, 4/25c, 4/25cx	●	●	●		TEXAS-INSTRUMENTS				
Contura 400C, 400CX, 410, 410C, 410CX	●	●	●		Extensa 450,455,455T,550,555CD,560,565	●	●	●	●
Contura 420 Dx4/75, 430 Dx4/100	●	●	●		Extensa 510	●	●	●	●
Contura Aero 4/25, 4/33C	●	●	●		Extensa 600,650,Travelmate,6020,6030,6050	●	●	●	●
Armada 1100 series, 4100 series	●	●	●	●	Travelmate 5000, 5300	●	●	●	●
DEC					TOSHIBA				
DEC Hi-Note	●	●	●		Portege 610CT, Satellite Pro 400CS/CDT200CDS	●	●	●	●
DEC Hi-Note Ultra	●	●	●		Tecra T500, Pbrtege 650	●	●	●	●
DEC Hi-Note VP	●	●	●	●	Tecra T700CS,T700CT	●	●	●	●
DELL					Tecra T710CS, T710CT, T720CS, T720CT, T730	●	●	●	●
Latitude 425,433,433c,433cx,450c,450cx	●	●	●		T2000, T2000SX, T2000SXe, T2200SX	●	●	●	●
Latitude XP 450c,475c,4100c,4100cx, XPI	●	●	●		T1000LE, T1800, T1850, T1850C Notebook	●	●	●	●
Latitude MX,MC,LX4100C	●	●	●		T2100/CS/CT, T2105/CS/CT	●	●	●	●
Latitude XPI 100,133	●	●	●	●	T2150CDT, T2150CDS, T2155CDT, T2155CDS	●	●	●	●
HEWLETT PACKARD					T2110, T2115, T2130, T2135	●	●	●	●
Omnibook 600C,600CT	●	●	●		T4400, T6400, T6600 Notebook (All)	●	●	●	●
Omnibook 4000,5000,5500	●	●	●		T4500, T4600, T4700, T4800, T4850CT	●	●	●	●
					T1900, T1910, T1950, 1960 (All), T4900CT	●	●	●	●
					T2400,T2450,T3400,T3600	●	●	●	●

Memory Size	4Mb	8Mb	16Mb	32Mb
Price Band A	£39	£58	£107	£209
Price Band B	£45	£67	£119	£229
Price Band C	£49	£79	£139	£279
Price Band D	£55	£89	£154	£309
Price Band E	£59	£97	£175	£345

We also stock a wide range of notebook accessories & upgrades. Please call.

Five year exchange warranty



(See facing page)

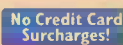
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on request. E & OE. Partners DRM & J Furby

Warranty & Support

In addition to any manufacturers warranty
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covered by our own 12 month return to
base warranty. Consumables are covered by
a 90 day warranty. Should you have a
problem our dedicated after sales team will
be waiting to help – Call 01705 662299



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FREephone:

0800 666500



MICROSAVE PC

PORTABLE



Also available with 150 MHz and 166 MHz for ultimate performance

- 133 MHz Pentium® processor
- PCI Bus system with Plug & Play BIOS and 256Kb Cache
- Choice of 11.3" Dual Scan or 10.4" / 12.1" TFT Active (All are SVGA: 800x600 resolution) colour screens
- 16Mb EDO Ram upgradable to 32Mb Ram
- Built-in Eight Speed CD-ROM Drive
- 1 Gig User removable 'pocket-size' hard disk
- Built-in 3.5" 1.44Mb floppy drive (user removable)
- Rechargeable internal removable NiMH battery
- PCMCIA Slot which can take 1 x Type III or 2 x Type II
- Built-in 2 button Trackpad and console style joypad
- 32-bit PCI Video Card with 2Mb Video RAM
- Built-in 16-bit stereo sound card, stereo speakers and hands-free microphone (Windows and Soundblaster compatible)
- LCD Display showing machine status
- Universal AC Charger & Auto-Sensing Mains Adapter
- Carry Case
- Advanced Power Management
- 12 Months Return To Base Warranty

Microsave 5400 Series

DUAL SCAN 11.3" £1275
Total price inc. delivery and Vat is £1515.75

ACTIVE TFT 10.4" £1399
Total price inc. delivery and Vat is £1661.45

ACTIVE TFT 12.1" £1749
Total price inc. delivery and Vat is £2072.70



- 133 MHz Pentium® processor upgradable to 200MHz
- PCI Bus system with Plug & Play BIOS and 256Kb pipeline burst cache
- Choice of 11.3" Dual Scan or 10.4" / 12.1" TFT Active (All are SVGA: 800x600 resolution) colour screens
- 32Mb EDO Ram upgradable to 72Mb Ram
- Built-in Eight Speed CD-ROM Drive
- 1 Gig User removable 'pocket-size' hard disk
- Built-in 3.5" 1.44Mb floppy drive (user removable)
- Rechargeable internal removable Duracell Worldwide standard smart battery with on screen battery gauge
- PCMCIA Slot which can take 1 x Type III or 3 x Type II
- Built-in 2 button Trackpad and console style joypad
- 64-bit PCI Video Card with 2Mb EDO Video RAM
- Built-in 16-bit stereo sound card, stereo speakers and hands-free microphone (Windows and Soundblaster compatible)
- LCD Display showing machine status
- Universal AC Charger & Auto-Sensing Mains Adapter
- Carry Case

Microsave 6200 Series

DUAL SCAN 11.3" £1575
Total price inc. delivery and Vat is £1868.25

ACTIVE TFT 10.4" £1649
Total price inc. delivery and Vat is £1955.20

ACTIVE TFT 12.1" £1999
Total price inc. delivery and Vat is £2366.45

Price-busting Pentium Portable



This picture shows the optional 8 speed CDROM

- 90 MHz Pentium® processor
- Large 10.4" Dual Scan Colour Screen
- 1Mb Video RAM
- 16Mb Ram upgradable to 32Mb
- 540Mb hard disk
- 3.5" 1.44Mb floppy drive which can be exchanged for CDROM
- Built-in Touchpad with 2 buttons
- Rechargeable internal NiMH battery
- PCMCIA Slot: 1 x Type III or 2 x Type II
- 16-bit stereo soundblaster compatible soundcard with built-in speakers, microphone and sound software
- Universal AC Charger & Auto-Sensing Mains Adapter
- Advanced Power Management
- 12 Months Return To Base Warranty
- 8 Speed CD-ROM option add £195 + vat

Mitac 5024 Series

£899

Total price inc. delivery and Vat is £1073.95

Finance Example: 5024 is £899 + vat = £1056.33 total cash price (collected). Deposit is 10% followed by 36 equal monthly payments of £34.53 (APR 19.9% - Variable). Written quotation available on request.

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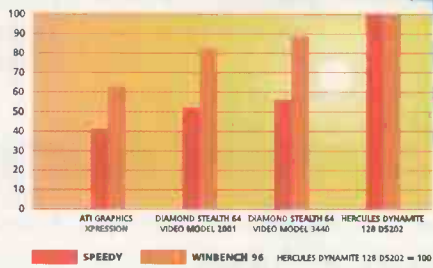
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A SERIES NOTEBOOKS

MODEL	PROCESSOR	MEMORY	HARD DRIVE	CD	SCREEN TYPE	PRICE
A Series	Pentium 120Mhz	16MB	1.0GB	Yes	11.3" Colour	£1359
A Series	Pentium 120Mhz	16MB	1.0GB	Yes	12.1" TFT Col	£1699

P SERIES NOTEBOOKS

MODEL	PROCESSOR	MEMORY	HARD DRIVE	CD	SCREEN TYPE	PRICE
P Series	Pentium 100Mhz	8MB	800MB	Yes	11.3" TFT Col	£1399
P Series	Pentium 133Mhz	16MB	800MB	Yes	11.3" TFT Col	£1599
P Series	Pentium 133Mhz	16MB	1.2GB	Yes	11.3" TFT Col	£1649



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- Extended Warranty options including TotalCare



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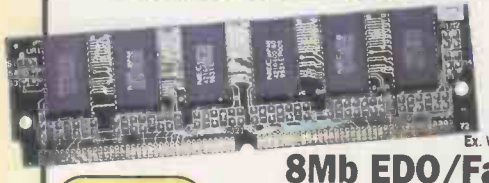
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	16Mb	500987-004	MEK15	KST-0987/16	£107	£125.73
COMPAQ Deskpro XL, ProLiant 1500 series, ProSignia 300, 500	8Mb	148188-001	MEK100	KTC-1481/8	£68	£79.90
	16Mb	148189-001	MEK105	KTC-1481/16	£135	£158.63
	32Mb	148190-001	MEK110	KTC-1481/32	£224	£263.20
LTE 500, 5100, 5200	8Mb	213515-001	MEK120	KTC-E5000/8	£68	£79.90
	16Mb	213515-002	MEK125	KTC-E5000/16	£122	£143.35
	32Mb	213515-003	MEK130	KTC-E5000/32	£232	£272.60
IBM Aptiva	4Mb	9267539,070N04	MEK200	KTM-APTIV/4	£29	£34.08
	8Mb	9267541,070N08	MEK205	KTM-APTIV/8	£59	£69.33
	16Mb	9267543,070N01	MEK210	KTM-APTIV/16	£107	£125.73
	32Mb	9267545,070N32	MEK215	KTM-APTIV/32	£213	£250.28
PC365 S180, 6589-10U & 18U 6589-17U, S200 6589-12U	16Mb	76H0274	MEK220	KTM-0274/16	£153	£179.78
	32Mb	76H0275	MEK225	KTM-0274/32	£296	£347.80
DELL PowerEdge XE, Optip, Omniplex 4100, Dimension XPS P60	4Mb	330-3325	MEK300	KTD-LMT/4	£29	£34.08
	8Mb	330-3083	MEK305	KTD-LMT/8	£57	£66.98
	16Mb	330-3327	MEK310	KTD-LMT/16	£107	£125.73
	32Mb	N/A	MEK315	KTD-LMT/32	£207	£243.23
TOSHIBA T2100, T2105, T211, T2135, T2150	4Mb	NW2026U	MEK400	KTT-2100/4	£48	£56.40
	8Mb	PA2027U	MEK405	KTT-2100/8	£82	£96.35
	16Mb	NW2028U	MEK410	KTT-2100/16	£156	£183.30
	24Mb	NW2029U	MEK415	KTT-2100/24	£224	£263.20
Portege 610C, Satellite Pro 400CDT	8Mb	NW2031U	MEK420	KTT-610/8	£87	£102.23
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MEK735 32MB KTM8X32L-60T	£213	£250.28
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MEK755 16MB KTM4X32L-60ET	£107	£125.73
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MEK795 8MB KTM2X36L-60ET	£78	£91.65
MEK800 16MB KTM4X36L-60ET	£122	£143.35
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1.7Gb Scirocco 11ms E-IDE		£139	£163.33
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8Mb 2x36 72 pin	£39	£45.83
8Mb EDO 72 pin	£19	£22.33
16Mb 4x32 72 pin	£45	£52.88
16Mb 4x36 72 pin	£59	£69.33
16Mb EDO 72 pin	£45	£52.88
32Mb 8x32 72 pin	£89	£104.58
32Mb EDO 72 pin	£89	£104.58

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16Mb 168pin EDO DIMM	£89	£104.58
8Mb 168pin DRAM DIMM	£49	£57.58
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Pentium™200	£325 £381.88	£427 £501.73	£450 £528.75	£392 £460.60	£387 £454.73	£397 £466.48
Pentium™166 MMX	£285 £334.88	£387 £454.73	£410 £481.75	£352 £413.60	£347 £407.73	£357 £419.48
Pentium™200 MMX	£345 £405.38	£447 £525.23	£470 £552.25	£412 £484.10	£407 £478.23	£417 £489.98

	Intel Venus	Intel Marl	Intel TC430HX	PR5-256	PR5-R2	PN5
Processor	Pentium Pro P6 EDO/FPM	Pentium P5 EDO/FPM	Pentium P5 EDO/FPM	Pentium P5 EDO/FPM/SDRAM	Pentium P5 EDO/FPM	Pentium P5 EDO/FPM
Memory	256Mb	128Mb	128Mb	4kx72 2xDIMM	4kx72	4kx72
No. Slots	256k Pbc On Board	256k Pbc On Board	256k Pbc On Board	256K Pbc On Board	256K Pbc On Board	256K Pbc On Board
Max Memory	None	256K Pbc On Board	256K Pbc On Board	COAST Socket	COAST Socket	COAST Socket
Cache	Intel 440FX	Intel 430HX	Intel 430HX	Award Flash	Award Flash	Award Flash
Chipset	intel 2Mb Flash	intel 1Mb Flash	intel 1Mb Flash	3PCI 4ISA	3PCI 4ISA	3PCI 4ISA
Bios	3PCI 3ISA 1SHR	3PCI 2ISA 1SHR	3PCI 2ISA 1SHR	Integrated	Integrated	Integrated
Expansion I/O	Integrated	Integrated	Integrated	2 Channel 4 device	2 Channel 4 device	2 Channel 4 device
PCI IDE	2 Channel 4 device	2 Channel 4 device	2 Channel 4 device	2 Drives 2.88Mb	2 Drives 2.88Mb	2 Drives 2.88Mb
Floppy	2 Drives 2.88Mb	2 Drives 2.88Mb	2 Drives 2.88Mb	2 16550 High Speed	2 16550 High Speed	2 16550 High Speed
Serial	2 16550 High Speed	2 16550 High Speed	2 16550 High Speed	ECC/EPP	ECC/EPP	ECC/EPP
Parallel	ECC/EPP	ECC/EPP	ECC/EPP	Serial	Serial	Serial
Mouse Port	PS/2	PS/2	PS/2	AT	AT	AT
Keyboard Port	PS/2	PS/2	PS/2	No	No	No
Game Port	No	No	No	No	No	No
Integrated Audio	No	No	Crystal P&P	No	No	No
Integrated Video	No	No	Yamaha OPL3 FM	No	No	No
Form Factor	ATX	ATX	ATX	Baby AT	Baby AT	Baby AT

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Pentium™Pro (P6) 200MHz 512k Cache	£790 £928.25	£972 £1142.10	£1215 £1427.63

Pentium™ Motherboards

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Roldec Technical Tip:

Need help with Windows®95? Check out the help files in the Admin/Reskit/Helpfile directory on the Windows®95 CD-ROM. They are a very useful source of help and troubleshooting information.



Memory prices fluctuate daily according to market conditions - please call for the very latest prices.

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Turbo C++ v4.5 For Windows	£54	£63.45
Turbo C++ v5.0 For Win 95 & NT	£205	£240.88
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CorelDRAW! 4 CD	£80	£94.00
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CYBER MEDIA		
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	Ex. VAT	Inc. VAT
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SmartSuite v4 Win 3.11 3.5"	£299	£351.33
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SmartSuite '96 For Windows 95 CD	£290	£340.75
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Office v4.2 Standard Win 3.11 3.5"	£325	£381.88
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Office v4.3 Pro For Win 3.11 3.5"	£423	£497.03
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Office 97 Professional CD	£449	£527.58
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Access v7 For Windows 95 3.5"	£225	£264.38
Publisher v2 3.5"	£71	£83.43
Publisher '97 For Windows 95 CD	£72	£84.60
Money 97 For Windows 95 CD	£21	£24.68
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PC Anywhere 32Bit For Win 95 & NT	£99	£116.33

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Windows NT V4 SERVER inc. 5 clients	£569	£668.58
Windows NT V4 SERVER inc. 10 clients	£799	£938.83
Windows NT V4 Workstation on CD	£220	£258.50

MS Windows NT V4 Workstation

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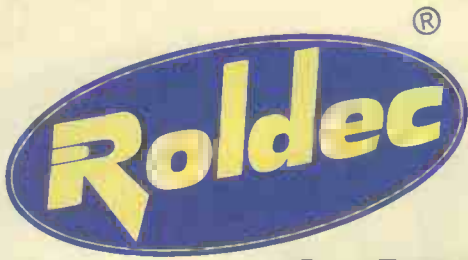
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DAP 6200 ISDN Adaptor Data Only Ext	£289	£339.58
DAP 6300 Lite ISDN Data/Analogue	£369	£433.58
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Parallel ISDN Adapter External	£129	£151.58
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Courier-I ISDN/Analogue modem Int.	£285	£334.88
Courier-I ISDN/Analogue modem Ext.	£285	£334.88

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PACE 28.8 Accura Voice Mail	£109	£128.08
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Motorola 28.8 V34 Internet Solution Ext.	£102	£119.85
Motorola 28.8 V34 Prof. Solution Ext.	£95	£111.63
Motorola 33.6 Premier Data/Fax Modem	£179	£210.33
Multitech 28.8 V34 MT2834ZDX Ext.	£85	£99.88
Multitech 28.8 V34 MT2834ZPX Int.	£96	£115.15
Multitech 14.4 V32 MT1432BLK Ext.	£220	£258.50
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PACE 28.8 V34 Microlin NB34 PCMCIA	£149	£175.08
PACE Europe and USA Adaptor pack	£25	£29.38
PACE GSM Datacard for Panasonic 400	£175	£205.63
PACE Microlin 33.6 Fax/Modem External	£134	£157.45
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PACE Microlin 33.6 Fax/Modem/Voice Ext.	£148	£173.90
PACE Microlin 33.6 Fax/Modem/Voice Int.	£148	£173.90
Roldec 14.4 V32 Fax/Modem External	£39	£45.83
Roldec 33.6 V34 Fax/Modem Internal	£67	£78.73
Roldec 33.6 V34 Fax/Modem External	£82	£96.35
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US Robotics 28.8 Sportster X-Jack PCMCIA	£130	£152.75
US Robotics 33.6 V34 Sportster VI Int.	£130	£152.75
US Robotics 33.6 V34 Sportster VI Ext.	£130	£152.75
US Robotics 33.6 Winmodem Internal	£79	£92.83
USR 33.6 Sportster FLASH - 56Kbps ready	£156	£186.83
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DE-816TP+ 16 Port (16xRJ45-BNC-AUI)	£165	£193.88
DE-805TP 5 Port (5xRJ45-BNC) MicroHub	£59	£69.33
DE-950 Network print server External	£169	£198.58
8097C 8 Port Hub with BNC Link	£89	£104.58
8097P 9 Port Hub (9xRJ45) Unmanaged	£89	£104.58
824TP 24 Port Hub (24xRJ45) Unmanaged	£259	£304.33
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EtherExpress Pro/100 100Mbps PCI	£69	£81.08
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Dual Interface Ethernet Adaptor x6	£139	£163.33
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NE2000 16Bit RJ45 ISA	£46	£54.05
NE5500 plus 32Bit Combo RJ45/BNC ISA	£89	£104.58

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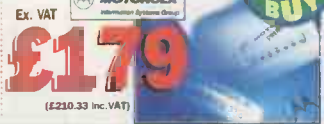
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Netware v3.12 25 User	£1,579	£1855.33
Netware v3.12 5 User	£479	£562.83
Netware v3.12 50 User	£1,995	£2344.13
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IntraNetwork v4.11 10 User on CD	£925	£1086.88
IntraNetwork v4.11 25 User on CD	£1,620	£1903.50
IntraNetwork v4.11 50 User on CD	£2,210	£2596.75
IntraNetwork v4.11 250 User on CD	£5,550	£6521.25
LOTUS		
Notes v4.1 Starter pack for Win. 95	£649	£762.58
Notes v4.11 Starter pack X-Platform	£649	£762.58

Motorola 33.6 Premier Data/Fax modem



£179 Ex. VAT
(£210.33 inc. VAT)

Roldec Technical Tip:

Have you got a 33.6Kbps capable modem? If so then you should use a 16650 UART equipped serial port as the 16550 on most motherboards will not be able to take full advantage of this speed increase.

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Printers

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LBP460 Windows Laser	£189	£222.08
LBP1260	£729	£856.58
EPSON		
EPL5500 1Mb	£335	£393.63
EPL5500 2Mb	£385	£452.38
EPL9000	£1,140	£1339.50
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LaserJet 5si	£1,975	£2320.63
LaserJet 5L	£269	£316.08
LaserJet 5P	£449	£527.58
LaserJet 4V A3	£1,349	£1585.08
LaserJet 6P	£449	£527.58
LaserJet 6MP	£559	£656.83
LaserJet 5 Colour	£4,150	£4876.25
OKI		
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OL600ex LED printer 1Mb	£255	£299.63
OL610ex LED printer 2Mb	£312	£366.80
BROTHER		
HL-730 600dpi 6ppm	£265	£311.38
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HL-1260 1200dpi 12ppm	£825	£969.38
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BJ-70 Colour Portable	£144	£169.20
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Stylus Color Pro	£305	£358.38
Stylus Color 200	£197	£231.48
Stylus Color 500	£133	£156.28
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DeskJet 870cxi	£298	£350.15
DeskJet 1600C Colour	£810	£951.75
DeskJet 690C	£189	£222.08
DeskJet 400 Colour	£116	£136.30
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HEWLETT PACKARD		
ScanJet 4C Colour Flatbed	£549	£645.08
ROLDEC		
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1200/2400dpi Flatbed	£299	£351.33
600/1200dpi Flatbed	£239	£280.83
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Vista S12 Plus 9600dpi	£499	£586.33
Vista S12 Pro 9600dpi	£844	£991.70
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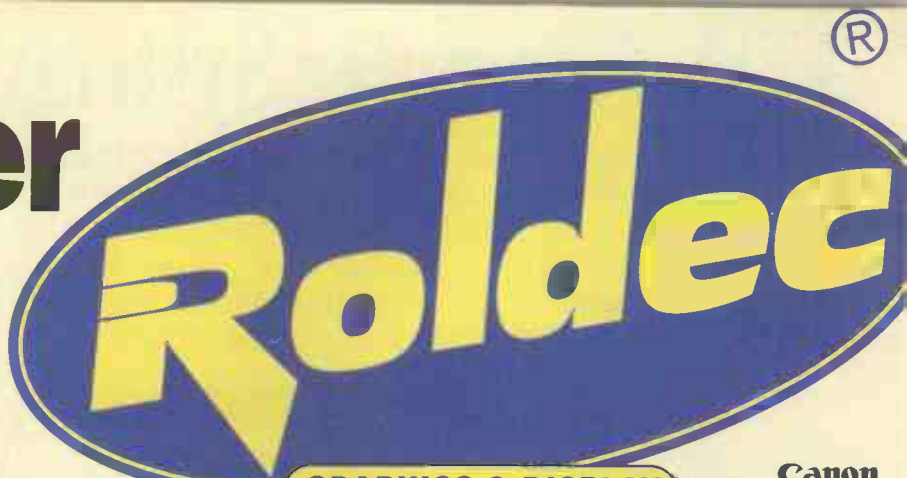


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20" Multiscan 20st	£1,620	£1,903.50
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STYLUS 500 COLOUR.....	£187
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BJ-230.....	£233
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Stealth 3D 2400 4Mb EDO.....	£94
Stealth 3D 3400 4Mb EDO.....	£169
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Fire GL 38160 8x8.....	£1279
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Stealth 2Mb Vram Memory.....	£105
Stealth 64 2Mb Vram MPEG.....	£295

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Imagine 128 1600 4Mb Series II.....	£399

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Pentium 150MHz	£115
Pentium 166MHz	£199
Pentium 200MHz	£349
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Pentium P55C MMX 220MHz	£399
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Pentium™PRO 200MHz 256Kb	£379
Pentium™PRO 166MHz 512Kb	£429
Pentium™PRO 200MHz 512Kb	£729
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5X86 133MHz	£29

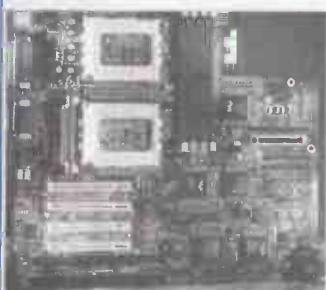
Cyrix

6X86 133MHz	£95
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6X86 166MHz	£135
6X86 200MHz	£259

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ETC Quality Win 95	£12
Fujitsu 4870 Membrain (Win 95 optional)	£17
Fujitsu 4720 Click Action (Win 95 Optional)	£24
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Pro Motherboards



Single Pentium Pro:-

Intel Venus	£209
SuperMicro P6SNE	£219
Micronics D6-IN	£189
Micronics P6-PI	£179
ABIT P6	£145

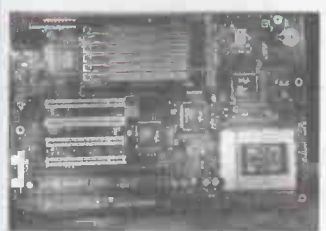
Dual Pentium Pro:-

Asustek P6RP7D Dual	£179
SuperMicro P6DNE Dual	£339
SuperMicro P6DNF Dual	£399
SuperMicro P6DNH Dual	£999
Micronics W6-PI Dual	£319
Micronics M6-PI Dual with Raid	£499

SuperMicro Intel Gigabyte Micronics

Spec	ChipSet	Mem	PCI	ISA	BIOS	SND	Hdd Cont	2S,1P,U	Form	Graphic	Size
Intel™Venus	440FX	256MB	4	3	AMI	N	4 x E-IDE	Yes	ATX	N	22x28cm
SuperMicro P6SNE	440FX	768MB	5	4	AMI	N	4 x E-IDE	Yes	ATX	N	22x28cm
SuperMicro P6DNF/E	440FX	1GB	4	4	AMI	N	4 x E-IDE	Yes	ATX	N	22x28cm
SuperMicro P6DNH	440FX	1GB	8	4	AMI	N	4 x E-IDE	Yes	ATX	N	22x28cm
Austek P6RP7D	450FX	1GB	8	2	AMI	N	4 x E-IDE	Yes	ATX	N	22x28cm
Micronics D6-IN	440FX	384GB	3	4	Phoenix	N	4 x E-IDE	Yes	ATX	N	22x28cm
Micronics M6-PI	450KX	256MB	4	4	Phoenix	N	4 x E-IDE	Yes	ATX	N	22x28cm
Micronics W6-LI	440FX	512MB	4	2	Phoenix	N	SB16 UW SCSI	Yes	ATX	N	30x35cm
Micronics M6-LI	440FX	256Kb	4	4	Phoenix	N	DAC960	Yes	ATX	64 bit	30x35cm
ABIT P6	440FX	512MB	7	2	Award	N	4 x E-IDE	Y	ATX	N	22x28cm

Pentium Motherboards



Single Pentium

P55	£49
G586-IPV HX	£75
G586-IPV VX	£95
Gigabyte M92-HX5	£115
SuperMicro P5STE	£155
BOST5XTRA	£149
Micronics M55	£149
Micronics M55+	£169
Micronics M54+	£179

Dual Pentium

Austek T55P2P4D	£399
-----------------	------

Spec	ChipSet	Mem	PCI	ISA	BIOS	Cache	Hdd Cont	2S,1P,USB	SND	Form	Size
P55 Triton MB	430FX	128MB	4	4	Award	256 PL	4 x E-IDE	Yes	N	ATX	22 x 28cm
G586-IPV Triton 3	430VX	128MB	4	4	Award	256 PL	4 x E-IDE	Yes	N	ATX	22 x 28cm
G586-IPC Triton 2	430HX	256MB	4	3	Award	512 PI	4 x E-IDE	Yes	N	ATX	22 x 28cm
Gigabyte M92-HX5	430HX	512MB	4	4	Award	512 PI	4 x E-IDE	Yes	N	ATX	22 x 28cm
P5STE Triton 2	430HX	768MB	3	4	Award	512 PI	4 x E-IDE	Yes	N	ATX	22 x 28cm
BOST5XTRA Triton 2	430HX	768MB	3	4	Award	512 PI	4 x E-IDE	Yes	N	ATX	22 x 28cm
Micronic M55	430HX	256MB	4	3	Phoenix	512 PI	4 x E-IDE	Yes	N	ATX	24 x 30cm
Micronic M55+	430HX	256MB	4	3	Phoenix	512 PI	4 x E-IDE	Yes	Y	ATX	24 x 30cm
Micronic W54+	430HX	256MB	4	3	Phoenix	512 PI	UW SCSI	Yes	Y	ATX	24 x 30cm

486DX4 Motherboard 4 x E-IDE, 2 x Fdd, 2 x 1655 UART, 1 x Parr. £55

Cases



Economy Mini Tower 200Watt PSU	£29
Economy Desk Top 200Watt PSU	£29
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PC Mini Tower 200 W 2x5.25", 1x3.5", 2 hidden	£39
PC Full Tower 230 W 6x5.25", 4x3.5", hidden	£69
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FOX Mini Tower 200W 2x5.25", 2x3.5", 2 hidden	£47
FOX Midi Tower 230W 3x5.25", 2x3.5", 2 hidden	£56
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BOCCA AT 4 Serial	
16550, 2 Bi-Dir Parallel	£59

Adaptec

Adaptec 1505 AT Total	£34
CD Kit	£56
Adaptec 1515 AT Ultra Total Connect	£56
Adaptec 1542 AT Bare Card	£115
Adaptec 1542 AT Full Kit	£155
Adaptec 2842 VLB Full Kit	£149
Adaptec 2920 Full Kit	£95
Adaptec 2940 Bare Card	£139
Adaptec 2940 Full Kit	£156
Adaptec 2940UW Ultra Wide Kit	£179
Adaptec 3940W Multi Channel Full Kit	£265
Adaptec Airport 1000 Remote Control	£59
Adaptec Airport 2000 Remote Control	£69
Adaptec 1460 PCMCIA	£109
Adaptec Airport 2500 Remote Control	£109
Adaptec 3985 Raid Full Kit	£459

MYLEX

Mylex DAC960P Raid Full Kit	£599
Mylex DAC960U Raid Full Kit	£699
Mylex DAC960PW Raid Full Kit	£699
Mylex DAC960UW Raid Full Kit	£799

Hard Drives



850Mb Western Dig	AC850A	64k	10ms	£95
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1.2Gb Seagate	ST31276A	64k	12ms	£119
1.2Gb Quantum	BF1280AT	64k	15ms	£109
1.2Gb Quantum	FBL1280AT	128k	11ms	£124
1.2Gb Western Dig	AC21200A	128k	10ms	£124
1.7Gb Seagate	ST31720A	128k	12ms	£149
1.6Gb Western Dig	AC31600A	128k	12ms	£137
1.7Gb Quantum	SR1700AT	128k	11ms	£139
2.0Gb Seagate	ST32140A	128k	10ms	£169
2.1Gb Western Dig	AC32100A	128k	11ms	£164
2.1Gb Quantum	TM2110AT	128k	10ms	£165
2.5Gb Fujitsu	M1638T	128k	10ms	£159
2.5Gb Quantum	BF2550AT	128k	15ms	£165
2.5Gb Quantum	SR2550AT	128k	11ms	£195
2.5Gb Western Dig	AC32500A	128k	11ms	£177
3.1Gb Western Dig	AC33100A	128k	11ms	£198
3.2Gb Quantum	TM3200AT	128k	10ms	£175
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2.1Gb IBM	85G3683	512k	9ms	£269
2.1Gb Quantum	XP2150S	1Mb	8ms	£425
2.1Gb Fujitsu	M2952S	512k	8ms	£399
2.1Gb Seagate	ST15230N	512k	10ms	£309
2.1Gb Seagate	ST32550N	1Mb	8ms	£479
4.0Gb Seagate	ST15230N	512k	10ms	£639
4.0Gb Seagate	ST34371N	1Mb	8ms	£749
4.2Gb Connor	CF40207S	512k	9ms	£598
4.3Gb IBM	74G704S	512k	8ms	£599
4.3Gb Quantum	XP34300S	1Mb	8ms	£575
9.0Gb Seagate	ST1410800	1Mb	11ms	£1169
9.0Gb Fujitsu	M29495SQ	512k	8ms	£1189

3.2Gb £175 £205.62

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2.1Gb IBM	46H6135W	128k	8ms	£279
2.1Gb Seagate	ST32155W	512k	10ms	£345
2.1Gb Seagate	ST32550W	1Mb	8ms	£379
4.0Gb Seagate	ST15230W	512k	10ms	£599
4.0Gb Seagate	ST34371W	1Mb	8ms	£769
4.5Gb IBM	93G2961W	512k	7ms	£699
9.1Gb Fujitsu	M2949QAW	512k	8ms	£1199

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1.44Mb Sony Fdd	£14	Fujitsu 540/640	£359
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HP C1553A	24GB	96GB	30MB	45MB	£1600	
EXABYTE 8505XL	7GB	14GB	30MB	45MB	£1295	
MAMMOTH	20GB	40GB	180MB	360MB	£3250	
MAMMOTH	400GB	800GB	180MB	360MB	£9995	
DLT 2000XT	15GB	30GB	75MB	150MB	£2350	
DLT 4000	20GB	40GB	90MB	180MB	£3450	
DLT 3500	75GB	150GB	75MB	150MB	£4995	
DLT 7000	35GB	70GB	300MB	600MB	£7500	

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54150	Intel P150MHz	£1199	£1325	£1675
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MODEL	PROCESSOR	HARD DISK	RAM	SCREEN	PRICE
5500CT	Pentium 133	2GB	16MB	12.1" TFT	£2869
5500CT	Pentium 133	1.35GB	16MB	12.1" TFT	£2149
5500CT	Pentium 120	1.35GB	16MB	10.4" TFT	£1789
5500C	Pentium 100	1.35GB	16MB	11.3" DSTN	£1389
5500CS	Pentium 100	810MB	16MB	11.3" DSTN	£1159

ACCESSORIES
Docking Station £399
Car Adaptor £69

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MODEL	PROCESSOR	HARD DISK	RAM	SCREEN	PRICE
800CT	Pentium 133	1.3GB	16MB	10.4" TFT	£2289
800CT	Pentium 100	1.3GB	16MB	10.4" TFT	£2499
800CT	Pentium 100	810MB	16MB	10.4" TFT	£2220
800CS	Pentium 100	1.3GB	16MB	10" DSTN	£2289
800CS	Pentium 100	810MB	16MB	10" DSTN	£1899

ACCESSORIES
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- 256K flash memory
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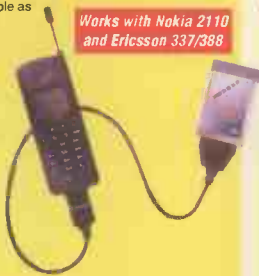


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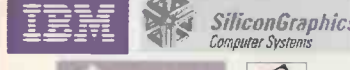
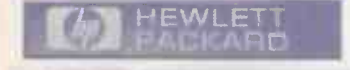
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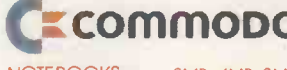
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SYSTEM 320SX (REV.2), 325D, 325P, 333D, 333P, 433P 4MB £29
OPTIMPLEX 486/ME SERIES, OPTIPLEX 4xx/LXe, /MXe, GP 15
OPTIMPLEX 5xx/ME SERIES, OPTIPLEX DGX, PERFORMANCE 486/ME, 4000XE, POWEREDGE EL PENTIUMS, SP/ME SERIES, GP 10

POWERLINE WORKSTATIONS, SYSTEM 486/E, 486/DE, /SE, GP 5

NOTEBOOKS

212N, 320N/V, 325NC, £39	2MB	4MB	8MB	16M
316L, 320L, 320LX, £24				
320SL, 325SL, £67			£128	
NL20, NL25, £29				
LATITUDE 4xx/C, /CX, £39			£124	
LATITUDE 4xx/M, /MC, /MCX & LX 475D, 4100/T, £39		£74	£124	
LATITUDE LMP100SD, P133ST, £69		£99	£134	
LATITUDE XP 4xxx/C, /CX SERIES &				

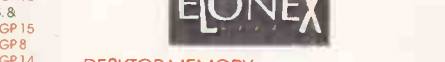


DESKTOP MEMORY

ALPHASERVER/ STATION 400, CELEBRIS /XL SERIES, DECpc LPx 560, 566, ST SERIES, XL SERVERS, PRIORIS HX, /LX, /XL SERVERS, GP 10
CELEBRIS GL 590, STATION SERIES, GP 15
CELEBRIS GL 5100, 5120, 5133/ST, CALL
DECpc 333sx LP 420SX, 425L, 433T & 433 WORKSTATION GP 3
DECpc APX 150, GP 16
DECpc DT, CALL
DECpc LP V, /V, /LPX, /MT SERIES, MTE SERIES & DECpc ST 4xx/ST SERIES, CALL
PRIORIS MTE SERIES, GP 17
VENTURIS SERIES, CALL

NOTEBOOKS

DECPc 325SL, £44	£69	£124	
DECPc 425SL/C, 433SL, £39		£129	
DECPc 4xx/SE, /SL PREMIUM, £44		£124	
DECPc 425 SL, /SLE, HINNOTE & /HINOTE ULTRA, /CS, /CT SERIES & ULTRA II CTE /CTS 5xxx SERIES, £39		£69	£134



DESKTOP MEMORY

PC425SX, PC433, GP 9	
PC450, PC466, GP 15	
PC500, PC560, GP 10	

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EPSON

LASER MEMORY	512K	1MB	2MB	4MB
EPL-3000, 5200+ & ACTIONLASER 1100, 1400, EPL-5000, 5200 & ActionLaser 1000, 1500, EPL-7100 & GQ5000, E19	£29	£39	£45	
EPL-4xxx, 8xxx SERIES & ACTIONLASER II	£49	£75		
EPL-5500, 5600, 9000 & ACTIONLASER 1600, EPL-6000, ACTIONLASER +	£29	£39	£45	£89



DESKTOP MEMORY	GP 6
DX2, P60, P75, P100	
NOTEBOOK MEMORY	4MB 8MB 16MB



NOTEBOOKS	2MB	4MB	8MB	16MB
TEMPO CARRIER & LX	£55			



NOTEBOOK MEMORY	4MB	8MB	16MB
FMV-BIBLO 450, 475, NL, /I, /S & 475, 499, NA, NU, /I, /S, 575 NA, /I, /X, £44	£74	£134	
FMV-BIBLO FMV-5100 NL/T	£59	£119	
FMV-51xx/NA2/NL, /N, /X, /NUW, /Y	£64	£114	



DESKTOP MEMORY	GP 8
P5 75, /90, /100, /120, 133 EDO, /ELITE & 166 Sovereign	GP 8
PC 4xx/33, DX33v, /66v, /Pv	GP 6
P4D	GP 6

NOTEBOOKS	4MB	8MB	16MB	20MB
HANDBOOK 486	£44	£139		
LIBERTY DX2, DX4	£44	£74	£139	CALL



DESKTOP MEMORY	GP 15
MULTIMEDIA PC SERIES, PAVILION SERIES, PC SERIES, VECTRA M2, N2, VE PC, V1.2 486, V1.3, XM2, XM3 SERIES	GP 15
NETSERVER LE, LH SERIES, VECTRA V1.2 PENTIUM & XP SERIES	GP 19

NETSERVER LH+ SERIES	CALL
NETSERVER 5xxx/LS, /LS2, /LS4	CALL
VECTRA 386/16N, /20N, /25N PC, 386/33N, N1	GP 3
VECTRA 386/25 PC	8MB CALL
VECTRA 486/xxST SERIES	16MB CALL
VECTRA 486/xxT SERIES	GP 11
VECTRA 486/xx IM, /MI, /N, /NI, /NL, /XM SERIES & WINDOWS CLIENT	GP 19

VECTRA QS /16S, /20, /RS, /20, /25, /C	4MB £59
VECTRA VA, VE2, V1.4, XA, XN4 PENTIUM/MT SERIES	CALL
VECTRA VT 6/150	CALL
VECTRA XU SERIES	GP 6
VECTRA XU 6/150 SERIES	CALL

NOTEBOOKS	4MB	8MB	16MB	32MB
OMNIBOOK 300, 425, 430	£44			
OMNIBOOK 530, 600C	£44	£69		
OMNIBOOK 4000 C/T	£39	£74	£124	
OMNIBOOK 5000, 5500 SERIES		£74	£124	£259

LASERS	256K	1MB	2MB	4MB	8MB
DESIGNJET SERIES	£35				
DESIGNJETS, 750C Plotter					
DESIGNJET 1200C /CPS, 1600's & LASERJET 4 & 5 SERIES	£45	£45	£60		
LASERJET IIX & IIXL Series	£55	£79	£119		
LASERJET 4L	£29				
LASERJET SL & SL-FS		£59	£109		



PROCESSORS	CYRIX 6x86
PENTIUM 120 MHz	£129 6x86 133 MHz £84
PENTIUM 133 MHz	£159 6x86 150 MHz £93
PENTIUM 166 MHz	£269 6x86 166 MHz £130
PENTIUM 200 MHz	£375 ABOVE CYRIX CPU'S



DESKTOP MEMORY	GP 15
APTIVA SERIES, PC 300, 330, 350, 360 SERIES	GP 15
EDUQUEST THIRTY/CD, THIRTY FIVE, FOURTY, FIFTY /CS	CALL
PC 500, 700 SERIES, POWER SERIES 800, PC SERVER 300, 310, 320, 486, PENTIUM SERIES, PS/VALUEPOINT P60D	GP 10
PC SERVER 500, PS/2 95 XP 486, SERVER 95/ARRAY	CALL
PS/1 (2133/2155-30 PIN), PS/VALUEPOINT (6384-30 PIN), GP 9	CALL
PS/1 286 (2011), 386SX (2121)	CALL
PS/1 ADVISOR, CONSULTANT, ESSENTIAL, EXPERT, INVESTOR, PRO 386SX, WILLLOW, PS/2 76, 77	GP 19
PS/2 25/286, 30/286	2MB £59
PS/2 25SX, 35 LS /SX, 40SX, 50Z, 55 LS /SX, 5x /LS /SLX /SX, 60, 65SX, 70, 80, E, PREMIER, ULTIMEDIA	GP 11



NOTEBOOKS	2MB	4MB	8MB	16MB	32MB
AMBRA TREKA 386SL £74					
LEXMARK SE 10		£44			
PS/2 CL57SX & THINKPAD 7xx/C SERIES	£59	£99			
PS/2 L40 /A33 /SX & PS/NOTE	£24	£44	£89		
PS/2 NS1 SL/C, SX, £34	£44	£84			
PS/2 P70 Series & P75		GP 19			
PS/NOTE N45 SL	CALL				
PS/NOTE 2618 & THINKPAD 350 /C	£34	£64	£114		
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THINKPAD 300	£29	£84			
THINKPAD 3xx, 7xx Series	£44	£74	£129		
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THINKPAD 365 X, /XD, 535, 560 & THINKPAD 760 E, /ED, /EL, /EX	£64	£114	£529		
THINKPAD 500, 510Cs	£44	£74	£129		
THINKPAD 530	£49	£89	£149		
THINKPAD 701 C /CS	£39	£69	£134		
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THINKPAD 760 /C, /CD, /L, /LD	£69	£119	£629		
THINKPAD 820 POWER SERIES	£144	CALL			
THINKPAD 830, 850	£59	£99	£149	£279	

LASERS	1MB	2MB	3.5M	4MB	8MB
4019/E, 4028, & LASERPRINTER /E	£55	£85	£119		
4029, 4037, ValueWriters & WinWriters LEXMARK 5E, 6, & 6A, 6P, 10, 10A, 10L, 10P & OPTRA E, Ep	£45		£59		
4039 SERIES, COLOURJET PS &					



LASER MEMORY	1MB	2MB	4MB	8MB
ECOSYS osi FS3500A		£49		
F-800, 800A, 800T	£55	£79	£135	
F-820, 850, 1200S, 1500, 1800A & 2000A, 3000A, 330, 5000	£35			
F-1000A	£59			
F-200S, 2000A, 3000A, 3300, £75	£99	£149		
FS-400, 3400, 3500, 5500A	£19	£29	£49	
FS-1500A	£59			



LASER MEMORY	1MB	2MB	4MB	8MB
MT-904, 904 PLUS	£39			
MT-905, 906	£89	£149		
MT-908	£29	£45		



NOTEBOOK MEMORY	4MB	8MB	16MB
3026e	£129		



DESKTOP MEMORY	PLEASE CALL
NOTEBOOKS	2MB 4MB 8MB 16MB
PROSPEED 486SX /C	£39
PROSPEED C /SX /Z0	£89
ULTRALITE III SL /25C	£59
ULTRALITE SL /20, /P	£59
ULTRALITE VERSA, E, M, P, V & VERSA 40xx SERIES	£49
VERSA S, 500, 550CD & 2xx SERIES	£39
VERSA 6000 SERIES	£84
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SILENTWRITER 95 /fx & 97 /fx, S62P	£39
SW2 MODEL 290, 90	£89



LASER MEMORY	1MB	2MB	4MB	8MB
OL 400	£55	£85		
OL 400, 410, 600, 610 /e, /ex, £55	£85	£139		
OL 410, 810	£59	£89	£139	
OL 800, 820	£59	£89	£139	
OL 810 /e, /ex	CALL	CALL		
OL 830, 840, 850	£65			



NOTEBOOKS	4MB	8MB	16MB	32MB
ECHOS 486 SERIES	CALL	CALL	CALL	
ECHOS PENTIUMS	£88	£148	£268	



DESKTOP MEMORY	GP 9
386, 486xx	GP 9
486DX	GP 15



NOTEBOOKS	1MB	2MB	4MB	8MB	16MB
CF-170, 270, 370	£29				
CF-280, 380, 480C	£29	£44	6MB £59		
CF-580, CF-V21P SX/25		£44	£64		
CF-61, 62					
CF-1000		£139			
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LASER PRINTERS	32K	1MB	2MB	4MB
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KXP-4400, 4401, 5400, SP100	£49	£79	£149	
KXP-4410, 4420, 4430, 4450L, 4451	£55	£85	£129	
KXP-4440, 5410, 6100	£59	£89	£139	
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KXP-4455		£89		



NOTEBOOK MEMORY	4MB	8MB	16MB
PC 300, 304	£109		
NB 470, 570, 750	£44	£74	£134

MATCHED MEMORY GUIDE PRICES

GP	2MB	4MB	8MB	16MB	32MB	64MB
GP 1	£21	£42	£59	£118		
GP 2	CALL	£18	£32	£69	£157	
GP 3	£21		£59			
GP 4		£18	£36	£69	£138	
GP 5		CALL	£53	£99	£185	£356
GP 6			£36	£63	£138	£314
GP 7			£40	£61	£137	£335
GP 8		£27	£49	£93	£178	
GP 9		£42		£118		
GP 10			£53	£99	£185	£356
GP 11		£27	£49			
GP 12		£27				
GP 13		£18	£32			
GP 14			£49	£93	£178	
GP 15		£18	£32	£69	£157	
GP 16			CALL	£105	£198	£371
GP 17		£27		£93		
GP 18		£18		£69		
GP 19		£27	£49	£93		
GP 20		CALL	£54	£98		
GP 21		£44	£74	£134		
GP 22			£88	£144	£268	
GP 23	CALL		£118			
GP 24	£30	£59	£59	£118		
GP 25		£59		£118		
GP 26			£52	£89	£183	£283
GP 27			£83	£136	£252	CALL



LASER MEMORY	1MB	2MB	4MB	8MB
PS-410	£65	£89	£139	
PS-815 /MR, 825 /MR		£95	£159	£199
COLOURSCRIPT 210, 230, & PS-860, 1700, 1725				£69
QMS-1000 Magic Colour LX, CX, Plus, &				£109



NOTEBOOK MEMORY	2MB
17NB, 18NB, NB/6	£49



NOTEBOOKS	1MB	2MB	4MB	8MB	16MB
PC 30xx SERIES, 9040, 9070		£39	£69	£129	
PC 62xx SERIES	£59				
PC 66xx SERIES		£74			
PC 67xx, 68xx SERIES	£29	£39			
PC 77xx, 8150, 8450 /L, 8660		£44		£129	
PC 8501 COLOURSTAR	£84				
PC 8700, 8800, 8900		£39	£74	£124	
PC 9000, 9030			£74	£124	
MEBIUS 575 /31, /91, PC-A 3xx SERIES	£74	£124			
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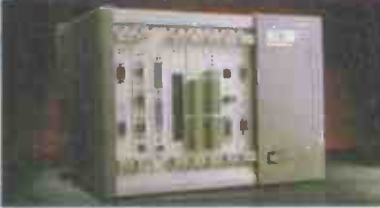
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Models MT-4 and MT-6 include special software designed for the Intel Pentium® processor with MMX technology

- **Third Dimension**
- **The Ultimate Human Body 3**
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- **Space Station Simulation**

Intel Pentium® processors with MMX™ technology include a set of instructions which enhance software specially written for these processors.



SmartSuite 96



SmartPics



David Bellamy's
Endangered Wildlife



Dr Hilary Jones'
Doctor in the House



Geoff Hamilton's
Garden Designer



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Bodyworks v5



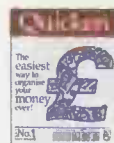
Designworks



Pressworks



Homewise



Quicken v5



Read, Write &
Type



KeyCAD Pro



Project Manager
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The Intel Pentium Processors with MMX technology include more internal cache which enhances even standard software such that the performance of a Pentium 166MHz processor with MMX technology is similar to that of a

standard Pentium 200MHz processor. We offer three models, Omega P166 desktop, P166 Colossus 'Best Buy' midi-tower model (shown above) and P200 Colossus full-tower model with the ultimate specification which

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P166

P166 MMX PowerStation DT-1M

- **P166 MMX Processor** Intel Pentium® 166MHz processor with MMX™ Technology
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- **1.2Gb Hard Disk** Enhanced IDE hard disk with fast access
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- **14" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **4w Speakers** Stereo speakers
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Desktop Case Colossus desktop with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-580

£ **1138.58** inc. VAT

£ **969** +VAT



P166

P166 MMX PowerStation MT-4

- **P166 MMX Processor** Intel Pentium® 166MHz processor with MMX™ Technology
- **P200 MMX Upgradeable** Upgradeable to Intel 200MHz Pentium with MMX™ technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion (shown)
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-552

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P200

P166 MMX PowerStation MT-6

- **Intel Pentium 200MHz processor with MMX Technology** with the highest performance under Windows 95
- **64Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **3.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Twelve Speed CD-ROM drive** Fast twelve speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **32 Wave Table Sound** Genuine Creative Labs SoundBlaster 32 hardware wave table plug and play advanced stereo sound card
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **512k Cache** Fast pipeline burst mode type
- **64-bit 3D 4Mb Graphics** ATI Rage II 3D graphics processor with 4Mb SGRAM dedicated video memory
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Triton II 430HX Advanced Chipset plug and play with Intel socket 7
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Full Tower Case Colossus full tower with 9 drive bays for plenty of expansion (not shown)
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

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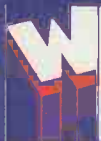
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TMMX2A



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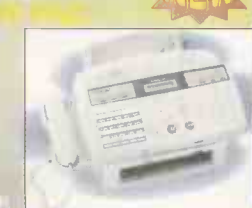
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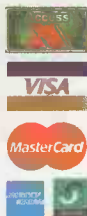
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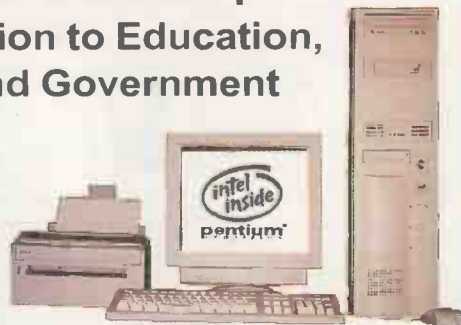
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- 1.2GB Mode 4 Enhanced IDE Hard Disk Drive
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- 32 Bit Local Bus Enhanced IDE Interface
- Smile 14" NI(1024x768), 28mm Dot Pitch Low Radiation Monitor
- 2 Enhanced 16550 UART Serial Ports, 1 Enhanced Parallel Port
- **64Bit Cirrus Logic CL5436 Windows Accelerator Card**
- High Quality Keyboard and Mouse



	100	120	133	150	166	200	166	200
INTEL	-	-	£539	£589	£579	£769	£769	£859
CYRIX	-	£499	-	£519	£549	£749	-	-
AMD	£469	£489	£519	-	-	-	-	-

PICO - HOME



- Spider Triton II VX Motherboard **512K** Cache, 3 x ISA, 4 x PCI Slots
- **16MB 60ns** RAM, High Quality Mini Tower Case
- 1.2GB Mode 4 Enhanced IDE Hard Disk Drive
- 1.44MB Floppy Drive
- 32 Bit Local Bus Enhanced IDE Interface
- Smile 14" NI(1024x768), 28mm Dot Pitch Low Radiation Monitor
- 2 Enhanced 16550 UART Serial Ports, 1 Enhanced Parallel Port
- **2MB - 64 Bit S3 VIRGE 3D Accelerator Video Card**
- High Quality Keyboard & Quickshot Ergonomic Mouse



	100	120	133	150	166	200	166	200
INTEL	-	-	£629	£679	£709	£899	£899	£949
CYRIX	-	£599	-	£609	£639	£839	-	-
AMD	£559	£579	£609	-	-	-	-	-

PICO - PRO



- Supermicro **P5Xtra** Motherboard **512K** Cache
- **32MB 60ns** EDO RAM, Premium Mini Tower Case
- **2.5GB** Mode 4 Enhanced IDE Hard Disk Drive (10)
- 1.44MB Floppy Drive
- 32 Bit Local Bus Enhanced IDE Interface
- Smile **15" NI(1280x1024)**, 25mm Dot Pitch **Cromaclear** Monitor
- 2 Enhanced 16550 UART Serial Ports, 1 Enhanced Parallel Port
- **4MB - 64 Bit S3 VIRGE 3D Accelerator Video Card**
- High Quality Keytronics Keyboard and Microsoft Mouse



	100	120	133	150	166	200	166	200
INTEL	-	-	£979	£1029	£1059	£1209	£1209	£1299
CYRIX	-	£939	-	£959	£989	£1189	-	-
AMD	£909	£929	£959	-	-	-	-	-

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MMX 32 AMD Wavetable Sound Card with 3D Sound, 32 Voices. Ex. VAT £49 ⁰⁰ Inc. VAT £59 ⁰⁰	32 Creative Labs Sound Blaster 32 Wavetable Sound Card, 32 Voices. Ex. VAT £79 ⁰⁰ Inc. VAT £93 ⁰⁰	AWE 64 Creative Labs Sound Blaster AWE64 Wavetable Sound Card, 64 Voices. Ex. VAT £129 ⁰⁰ Inc. VAT £152 ⁰⁰	8MB - 16MB Memory Upgrade from 8MB to 16MB Ex. VAT £19 ⁰⁰ Inc. VAT £23 ⁰⁰	16MB - 32MB Memory Upgrade from 16MB to 32MB Ex. VAT £34 ⁰⁰ Inc. VAT £39 ⁰⁰	16MB - 64MB Memory Upgrade from 16MB to 64MB Ex. VAT £129 ⁰⁰ Inc. VAT £152 ⁰⁰	16MB - 128MB Memory Upgrade from 16MB to 128MB Ex. VAT £299 ⁰⁰ Inc. VAT £352 ⁰⁰	MS MOUSE High Quality Microsoft Mouse Ex. VAT £14 ⁰⁰ Inc. VAT £17 ⁰⁰
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- 512k Pipeline Burst Cache
- Diamond Stealth 3D 2000 Video Card



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- Quality Keytronics Keyboard
- Upgrade all your RAM to EDO
- 512k Pipeline Burst Cache
- S3 VIRGE 4MB Video Card
- 2.5GB Harddisk



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SMILE MONITORS

Smile Technologies is the UK subsidiary of the Kuo Feng Corporation (KFC), a 30 year old US\$56 million company listed on the Taiwan Stock Exchange. Kuo Feng Corporation is able to supply the world with a complete line of reliable monitors in the sizes of 9", 14", 15", 17", 20", and 21". Smile monitors are built at Kuo Feng's state-of-the-art, 183,000 sq.ft., ISO-9002 certified manufacturing facilities near Taipei with 784 employees. KFC's newest Indonesia plant, located in western Java, accommodates three additional production lines with 108,000 sq.ft., of space. The plant is primarily engaged in the production of computer monitors with its employees adding a capacity of 45,000 per month to their overall capacity. By practising strict quality control throughout every phase of development they produce extremely reliable monitors. This has led Smile monitors to consistently receive superior ratings from leading computer publications.

SMILE, ITS GOOD FOR YOU!

SMILE'S BEST SELLER

"The technology that Smile had used for the monitor is pretty impressive. It has selected an NEC Cromacrator tube with 0.25mm dot pitch. This gives a lovely picture quality, which we found hard to fault, examining not just with our test software, but also several typical applications".

An amazing "100Hz at 800x600" ideal for DTP and CAD. Apart from the high quality picture, potential purchasers may also find the price a most attractive feature. Smile goes out of the door at a very competitive £229 street price. Overall, many people would be satisfied with

Dot Pitch	0.25mm
Visible Area	13.6"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO39	CA6336SL	£229.00	£249.00

14" COLOUR

Dot Pitch	0.28mm
Visible Area	12.9"
Max Resolution	1024 x 768
Horizontal Frequency	30 - 59 KHz
Vertical Frequency	50 - 100 Hz
Video Bandwidth	45MHz
User Control	98
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO36	CB1414VL	£149.99	£176.24

15" COLOUR

Dot Pitch	0.28mm
Visible Area	13.6"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO37	CA6336DL	£219.00	£257.33

15" COLOUR WITH SPEAKERS

Dot Pitch	0.28mm
Visible Area	13.6"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO46	MM6336SL	£249.99	£293.74

17" CROMA CLEAR

Dot Pitch	0.25mm
Visible Area	16"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	100MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO40	CA6736SL	£389.99	£458.24

17" COLOUR

Dot Pitch	0.28mm
Visible Area	16"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	100MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO38	CA6736DL	£349.99	£411.24

17" COLOUR

Dot Pitch	0.28mm
Visible Area	16"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	100MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO45	CA1706	£449.99	£528.74

20" COLOUR

Dot Pitch	0.28mm
Visible Area	18.7"
Max Resolution	1600 x 1200
Horizontal Frequency	30 - 85 KHz
Vertical Frequency	50 - 100 Hz
Video Bandwidth	100MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO41	CA2011	£829.99	£975.24

21" COLOUR

Dot Pitch	0.28mm
Visible Area	20"
Max Resolution	1600 x 1200
Horizontal Frequency	30 - 85 KHz
Vertical Frequency	50 - 100 Hz
Video Bandwidth	130MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO42	CA2111	£999.99	£1174.99

9" MONO

Dot Pitch	0.28mm
Visible Area	9"
Max Resolution	640 x 480
Horizontal Frequency	31.5 KHz
Vertical Frequency	60/70 Hz
Video Bandwidth	30MHz
User Control	Analog
Colour	Monochrome

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO43	MA0933	£89.99	£105.74

9" COLOUR

Dot Pitch	0.28mm
Visible Area	8.4"
Max Resolution	1024 x 768
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	45MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO44	CB0913DL	£275.00	£321.13

CTX MONITORS

CTX have a heritage of fine engineering and a reputation for forward thinking. They have a written commitment to excellence. They produce a high quality product with excellent support and guaranteed customer satisfaction. They have a complete line of Monitors to suit every type of user. At entry level there is the 1415 CLR which has a high refresh rate of 65Hz at 1024x768. At the mid range there is the delightful 1785XA. This is based around a 17" Diamondtron tube. This has an aperture grill of just 0.26mm. Whatever your requirement you can rest assured that there is a CTX monitor to suit you.

14" COLOUR

Dot Pitch	0.28mm
Visible Area	13.2"
Max Resolution	1024 x 768
Horizontal Frequency	30 - 50 KHz
Vertical Frequency	50 - 90 Hz
Video Bandwidth	45MHz
User Control	98
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO28	1415CLR	£139.99	£164.49

15" DIGITAL COLOUR

Dot Pitch	0.28mm
Visible Area	13.6"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 65 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	85MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO29	15650	£189.99	£223.24

15" FST COLOUR

Dot Pitch	0.28mm
Visible Area	13.6"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO51	15695	£209.99	£245.98

17" DIGITAL COLOUR

Dot Pitch	0.28mm
Visible Area	15.7"
Max Resolution	1280 x 1024
Horizontal Frequency	30 - 65 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO30	1765D	£349.99	£411.24

17" FST COLOUR

Dot Pitch	0.28mm
Visible Area	15.7"
Max Resolution	1600 x 1200
Horizontal Frequency	30 - 85 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO31	1785S	£525.99	£622.74

17" DIAMONDTRON COLOUR

Dot Pitch	0.26mm
Visible Area	16"
Max Resolution	1600 x 1200
Horizontal Frequency	30 - 85 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO34	1785XA	£549.99	£646.24

20" FST COLOUR

Dot Pitch	0.28mm
Visible Area	18.6"
Max Resolution	1600 x 1200
Horizontal Frequency	30 - 85 KHz
Vertical Frequency	50 - 120 Hz
Video Bandwidth	80MHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO32	2085S	£895.99	£1052.79

VIEWSONIC MONITORS

14" VIEWSONIC E641

Fully Plug and Play Windows 95 Compatible Monitor

Dot Pitch	0.28mm
Visible Area	13.2"
Max Resolution	1024x768
Horizontal Frequency	30 - 50 KHz
Vertical Frequency	31.5-48.4 KHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO16	E641	£196.00	£193.88

15" VIEWSONIC E641

Fully Plug and Play Windows 95 Compatible Monitor

Dot Pitch	0.28mm
Visible Area	13.2"
Max Resolution	1024x768
Horizontal Frequency	30 - 50 KHz
Vertical Frequency	31.5-48.4 KHz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO17	E655	£227.00	£266.73

15" VIEWSONIC V15GA

High Definition Monitor with Built in Speakers

Dot Pitch	0.27mm
Visible Area	14"
Max Resolution	1024x768
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 160 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO22	V15GA	£327.00	£384.23

15" VIEWSONIC V15GS

Fully Plug and Play Windows 95 Compatible Graphics Series Monitor

Dot Pitch	0.28mm
Visible Area	14"
Max Resolution	1024x768
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 160 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO19	V15GS	£299.00	£351.33

17" VIEWSONIC V17EA

Well featured Monitor with Built in Speakers

Dot Pitch	0.28mm
Visible Area	16"
Max Resolution	1024x768
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 120 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO23	V17EA	£495.00	£501.43

17" VIEWSONIC V17GA

High Definition Monitor with Built in Speakers

Dot Pitch	0.27mm
Visible Area	16"
Max Resolution	1280x1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 160 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO24	V17GA	£544.00	£639.00

17" VIEWSONIC V17GS

High Resolution Graphics Series Monitor

Dot Pitch	0.27mm
Visible Area	16"
Max Resolution	1280x1024
Horizontal Frequency	30 - 69 KHz
Vertical Frequency	50 - 160 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO20	V17GS	£499.00	£586.33

17" VIEWSONIC V17PS

High Resolution Professional Monitor

Dot Pitch	0.25mm
Visible Area	20"
Max Resolution	1600x1280
Horizontal Frequency	30 - 86 KHz
Vertical Frequency	50 - 160 Hz
User Control	Digital
Colour	Colour

ORDER No.	MODEL No.	Ex. VAT	Inc. VAT
MO25	V17PS	£599.00	£709.83

20" VIEWSONIC V20G

Huge Monitor, Ideal for CAD and DTP

Dot Pitch	0.28mm
Visible Area	18.4"
Max Resolution	1

MOTHERBOARD

SUPERMICRO
FASTEST PENTIUM MOTHERBOARD
UNBEATABLE PRICE!!!!

£129.99

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- Intel Triton II HX Chipset MMX Ready
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C3 S05 Thomson 486 DX2 66MHz 5V CPU	£16.00	£18.80
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C22 AMD Enhanced 486 DX4 100MHz 3.3V CPU	£19.99	£23.49
C7 AMD Enhanced 5x86 133MHz 3.3V CPU	£24.99	£29.36

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C11 Intel Pentium 133MHz CPU	£89.99	£105.74
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C31 Cyrix/IBM 686 P200+ CPU	£169.99	£199.74
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HEATSHIELD AND FAN	EX. VAT	INC. VAT
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C2 Quality Pentium Heatshield & Fan	£3.99	£4.69
C33 Quality 686/K5 Heatshield & Fan	£9.99	£11.74

SOUND CARD

	EX. VAT	INC. VAT
S013 Avance Logic 100 3D Soundcard Full SB16 Comp	£19.99	£23.49
S02 Creative Sound Blaster 16 Soundcard	£49.99	£58.74
S03 Creative Sound Blaster 32 Wavetable Soundcard	£79.99	£93.99
S08 Creative Labs AWE 64 Wavetable Soundcard	£129.99	£152.74

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High Quality 64Bit Sound Card
Fully Sound Blaster Compatible

S014 Spider PnP Wavetable Soundcard with 3D Sound	£49.99	£58.74
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SPEAKER

SP1 25W Mains Powered Speakers	£19.00	£22.33
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25WATT MAINS POWERED SPEAKERS
25 Watt Speakers
With Separate Power Supply.

£19.99
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SP2 120W Mains Powered Speakers	£29.00	£34.08
SP4 160W Mains Powered Speakers	£39.00	£45.83

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AC1 IDE Ribbon Cable 2 Connectors	£1.99	£2.34
AC5 2 Way Internal Power Splitter Cable	£1.50	£1.76
AC4 2m Mains Power Cable With UK Moulded Plug	£2.50	£2.94
AC3 Analogue Moulded Grip Joystick	£8.00	£9.40

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VD20 64 Bit Cirrus Logic CL5436 1MB Video Card	£19.99	£23.49
VD5 64 Bit S3 Triad4+ 1MB Video Card with MPEG	£79.99	£93.24
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VD28 Very Fast Add on Accelerator
Based on New Voodoo FX 3D Chipset.
4MB of Very Fast EDO Memory.
Needs Video Card With Feature Connector
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VD14 Diamond Stealth 3D 2000 2MB EDO Video Card	£69.99	£82.24
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VD29 MGA Matrix Millennium 4MB WRAM Video Card	£149.99	£176.24
VD23 MGA Matrix Mystique 3D 2MB WRAM Video Card	£79.99	£93.99

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VD25 Matrix Millennium 2MB to 4MB Memory Upgrade	£69.99	£82.24

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MS2 Spider 2 Button Serial Mouse	£3.25	£3.82
MS3 Microsoft Ergonomic 2 Button Serial Mouse	£14.99	£17.61
MS4 Omikron 3 Button Serial Mouse	£6.99	£8.21
MS5 Visual Ergonomic 3 Button Serial Mouse	£4.99	£5.86

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S06 Condenser Microphone on a Stand With Stand	£4.99	£5.86
S09 Neosheet With Condenser Microphone on a Stand	£8.00	£9.40

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NE2 BNC/RJ45 NE2000 Compatible PCI Network Card	£29.99	£35.24
NE9 BNC/RJ45 NE2000 Compatible ISA Network Card	£17.99	£21.14
NE18 Intel Ether Express 10/100 PCI Network Card	£79.00	£92.83
NE10 Com Etherlink III ISA Combi Network Card	£69.99	£82.24
NE3 100m RG58 Coaxial Network Cable	£22.00	£25.85
NE10 306m UTP/RJ45 Cable Cat 5 Roll	£84.99	£99.86
NE19 8 Port Ansel Network Hub	£79.00	£92.83

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HD30 3.2GB Quantum Fireball EIDE Hard Drive	£179.99	£211.49
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HD14 2.5GB Quantum Bigfoot Enhanced IDE
Made 4 Hard Disk With 3 Year Warranty.

HD13 1.2GB Quantum Bigfoot EIDE Hard Drive	£109.99	£129.24
HD37 2.1GB Quantum Bigfoot EIDE Hard Drive	£137.99	£162.14

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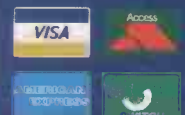
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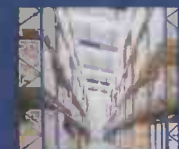
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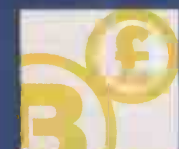
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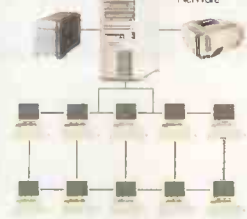
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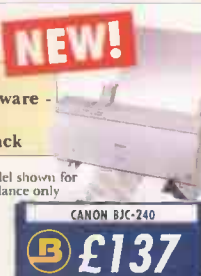


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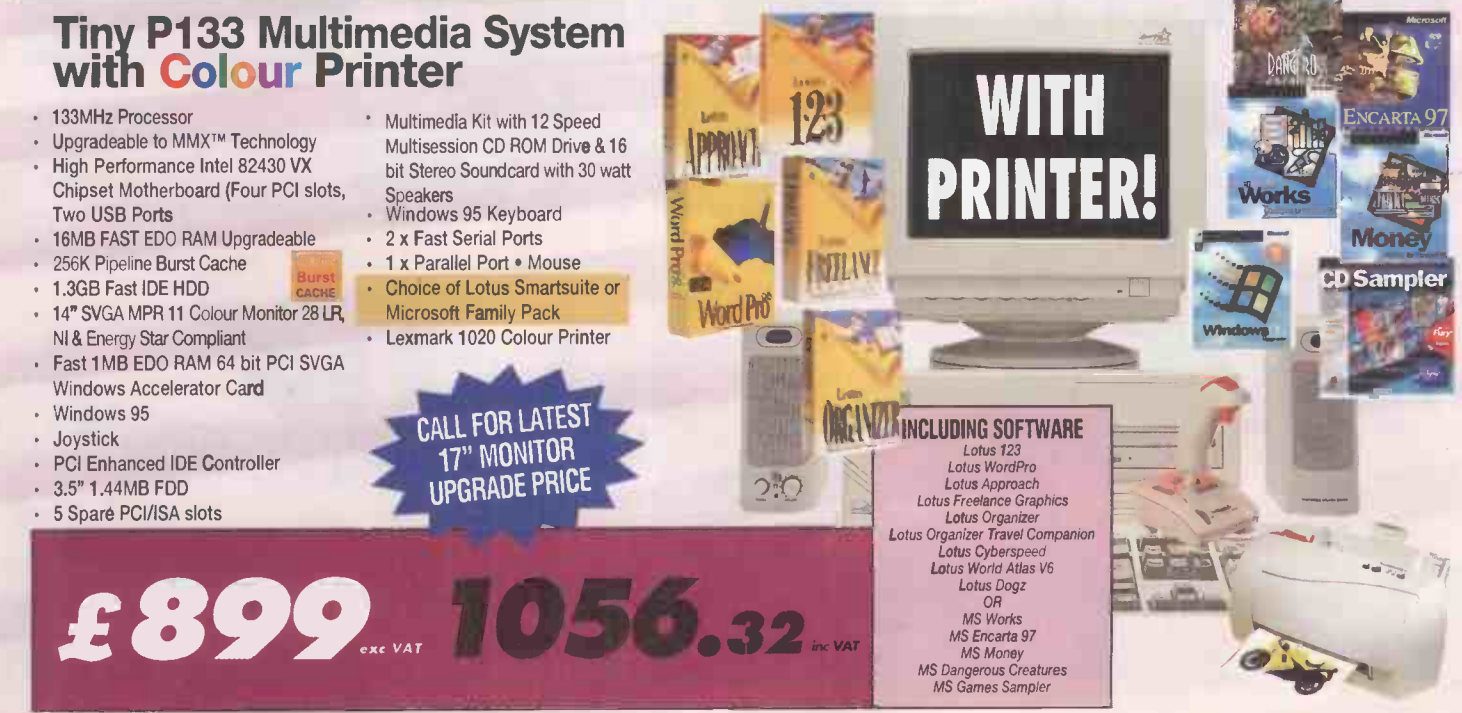
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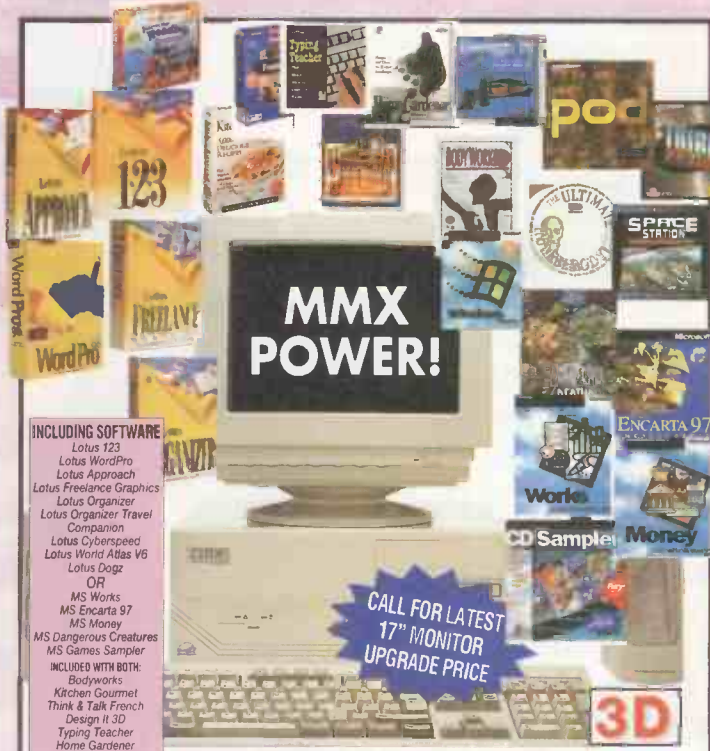
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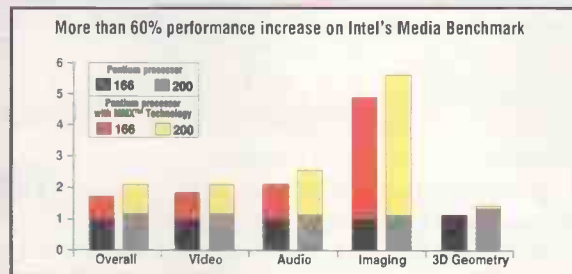
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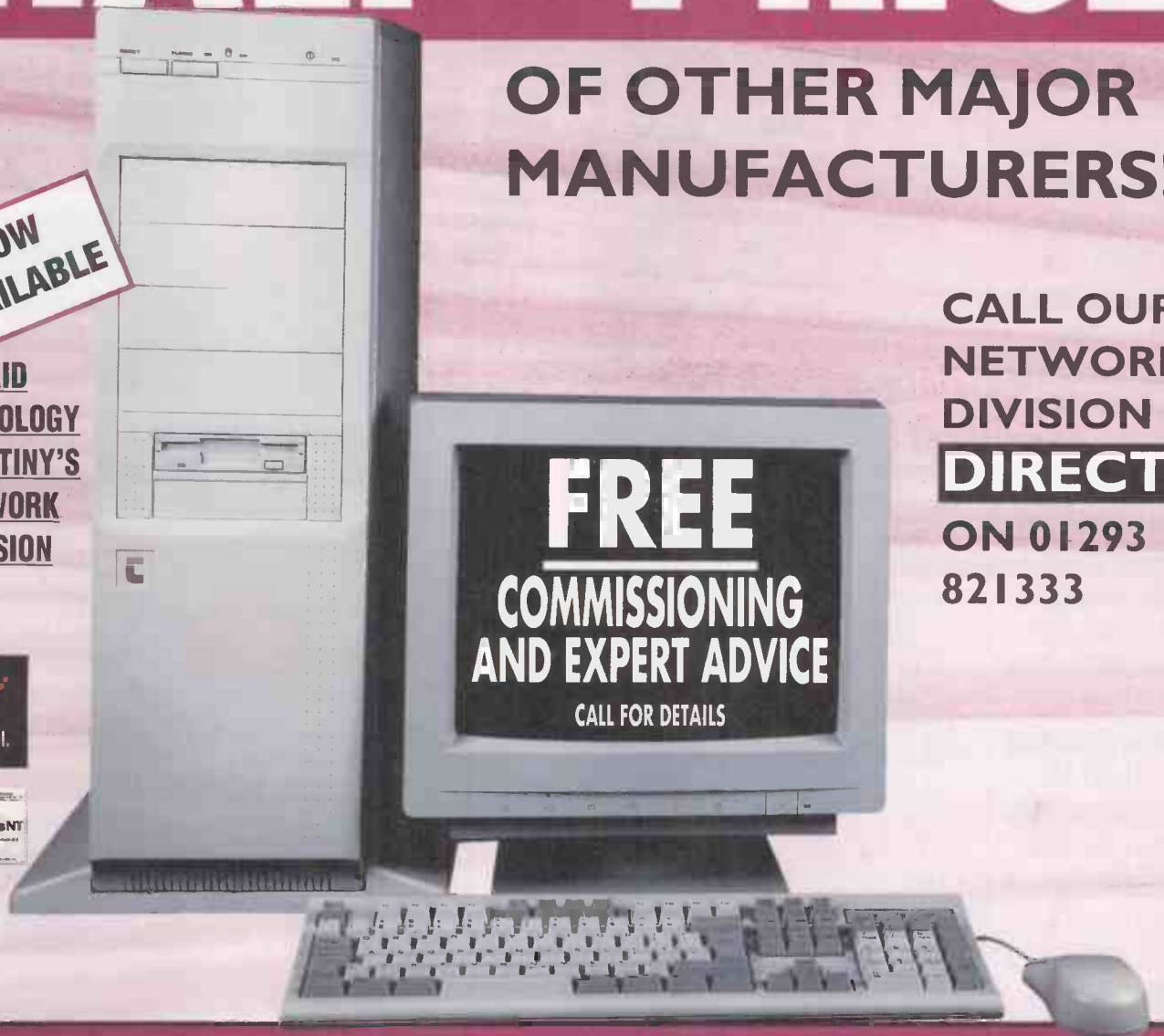
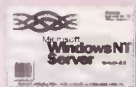
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Tel: 01273-622020

BRISTOL

UNION GALLERY, THE GALLERIES SHOPPING CENTRE,
BROADMEAD, BRISTOL Tel: 01179-300099

CARDIFF

91 ST MARY STREET (HOEL EGLWYS FAIR) (Opp. Morgan Arcade)
CARDIFF Tel: 01222-666022

CHELMSFORD

3 MARKET ROAD (Opp. County Hall) CHELMSFORD
Tel: 01245-252345

CROYDON

15 ST GEORGES WALK (Top of High Street) CROYDON
Tel: 0181-760 0076

GLASGOW

52 QUEEN STREET GLASGOW
Tel: 0141-204 2300

KINGSTON

8 CASTLE STREET (Nr. Clocks Sandwich Shop)
KINGSTON UPON THAMES Tel: 0181-549 9054

LEEDS

THEATRE WALK (Top Floor) THE HEADROW CENTRE (Formerly
the Schofields Centre) LEEDS Tel: 0113-242 5111

LIVERPOOL

71 BOLD STREET (Opp. Forbidden Planet) LIVERPOOL
Tel: 0151-7097095

LONDON

SONIC FOTO CENTRE 256 TOTTENHAM COURT ROAD LONDON
Tel: 0171-636 7613

MANCHESTER

PICCADILLY PLAZA MOSLEY STREET MANCHESTER
Tel: 0161-237 5115

NEWCASTLE

HIGH FRIARS (Monument Entrance) ELDON SQUARE NEWCASTLE
Tel: 0191-261 5252

NOTTINGHAM

UPPER MALL (Next to Boots) THE VICTORIA CENTRE
NOTTINGHAM Tel: 0115-941 9461

READING

BROAD STREET MALL (Upper Level - opp. Food Court) READING
Tel: 01734-596444

SHEFFIELD

54 CAMBRIDGE STREET (Opp. Henry's) SHEFFIELD
Tel: 0114-279 7855

SOUTHAMPTON

BARGATE SHOPPING CENTRE (Ground Floor) SOUTHAMPTON
Tel: 01703-232261

WATFORD

42 CHARTER PLACE (Upper Level - opp. C&A) WATFORD
Tel: 01923-210020

EALING & CHELSEA JUST OPENED!
CALL FOR DETAILS!

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BY CREDIT CARD - Provide your credit card details including expiry date. We promise not to charge your credit card until the day your order is despatched.



BY POST - Enclose a cheque for the full amount made payable to TINY COMPUTERS LTD and write your cheque guarantee card number and the expiry date on the reverse. *Please note* Orders cannot be processed until cheque has cleared.

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Education specials - call for our special prices.

WE ARE CONSTANTLY REVIEWING OUR PRICES & UPGRADING OUR SYSTEMS.

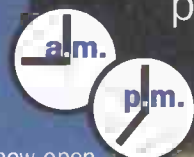
**CALL NOW FOR LATEST NEWS OR CALL IN TO YOUR
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TINY COMPUTERS LTD, REDHILL BUSINESS PARK,
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you talk, we listen

Improved
Technical Support
on a standard rate
phone call



iiyama monitors

The best. Why buy a PC with a so so, rebadged monitor. You spend all your computer time looking at the screen – why compromise. iiyama monitors are now standard shipment on Prestige, Platinum & Platinum SE models.



Our technical department is now open from 9:00 to 19:00 Monday to Friday and 9:00 to 15:00 on Saturdays. These longer hours do not affect our ability to support our customers - in January 1997* over 99% of our weekday customer calls were answered (by a real person not Voice Mail) within 30 seconds. Unlike some competitors we do not use Premium Rate (up to 48 pence per minute) numbers but a standard national code.

Up to 3 years On-site Support

The computer industry is moving towards collecting machines and repairing them at their premises. At Evesham Micros we believe in providing a quick solution to your problems. All Vale base units (except notebooks) and monitors are covered by 12 months on-site maintenance. This can be extended up to 3 years at probably the most competitive prices in the business (see page 4 for details).



Machines Ready to ship

We keep a large number of popular configurations ready to ship both at our head office and branches. If you need a PC in a hurry call us and we can help. Orders placed before 16.00 can be shipped for next day delivery to mainland UK (subject to credit/credit card approval).

A stable foundation

the Company...

- Established 13 years with secure financial status.
- Founder member of the Personal Computer Association and member of its payment protection plan.
- Lifetime technical support by friendly, knowledgeable and award winning team.
- Optional installation/training service.
- 10 year labour warranty – a “decade of service”.

the basics...

- Intel PCIsset motherboards for top performance.
- Top quality name-brand components.
- Choice of Windows 95 or DOS/Windows 3.11 operating system.
- Upgrade to Windows NT 4 available.
- 24 hour dynamic burn-in procedure.

the deal...

- Reasonable delivery charges.
- Business Lease Rental options.
- Cost effective upgrades.
- No deposit personal finance options.
- Credit cards charged only AFTER shipment.
- 14 day money back guarantee.

Please note that we are unable to offer a 14 day moneyback guarantee for any software products.



Certificate No. FS 31710
ISO9002 (BS5750 part 2)

Evesham Micros

A choice of 4 software bundles

* Survey period: 27th January to 31st January.

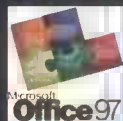
Microsoft Office 97

Consumer edition

For the Home user we offer the Office 97 Student Edition incorporating:

Word 97, Excel 97, Access 97, Powerpoint 97 & Outlook 97.

To qualify you or somebody in your family needs to be aged 5 or over and in full or part-time education.



Business edition

For the Business or SOHO user our new offer this month is the Microsoft Office 97 Business Edition which includes:

Word 97, Excel 97, Outlook 97, AutoRoute Express & Publisher 97.



Please note that actual products (including screen displays) may not exactly match the photographic representations. Industry standard practice is to quote a monitor's CRT size – the actual viewing area is approximately 1" less. Speakers are only included with multi-media versions of Vale PCs (Microsoft Media 97 and Lotus Multimedia Office 96). The Intel Inside Logo, Pentium and OverDrive are registered trademarks and the Pentium Processor Logo, the Pentium Pro Processor Logo and MMX are trademarks of Intel Corporation. Microsoft is a registered trademark and the Office logo is a trademark of Microsoft Corporation. All other trademarks acknowledged.

I want an iiyama monitor.

I need 16Mb to run Windows 95.

If I have a hardware problem I want it fixed on-site.

How about increasing the cache size to 512k?

When I dial a technical support number, I want speak to somebody!

I sometimes need to speak to Technical Support outside office hours.

I want a machine tomorrow!

Office 97 is a World leading product. Can you supply it?



when selecting your Multimedia pack!!!

see VALE models for prices

Microsoft

- ◆ Works 4
- ◆ Explorapedia
- ◆ Windows Entertainment Pack
- ◆ Fury 3 (trial version)
- ◆ SideWinder Joystick

- ◆ Money 97
- ◆ Encarta 97 (International Edition)
- ◆ Dinosaurs
- ◆ Golf 3
- ◆ Scenes
- ◆ Fine Artist



◆ Media 96 still available for Windows 3.1 users

Lotus Office 96

Lotus SmartSuite 4 (for Windows 3.1) or SmartSuite 96 (for Windows 95): 1-2-3, WordPro, Approach, Freelance Graphics, Organiser. Software Toolworks Grolier Encyclopaedia for 1996 ITN European Video Atlas

- ◆ Quicken 4
- ◆ CorelDRAW! 4
- ◆ Superb games: Screamer, Command & Conquer, Simon the Sorcerer II



Like the Vale PCs they are fitted to, our multimedia kits are quality conscious!! We offer high quality sound cards, CD-ROM drives and speakers, and two of the best software suites available.

- ◆ High performance eight and twelve speed CD-ROM drives
- ◆ 16 bit SoundBlaster compatible audio (Prima & Prestige models).
- ◆ Yamaha on-board 16 bit sound (Platinum models).
- ◆ Creative Labs Vibra 16 sound (Platinum Pro models).
- ◆ Creative Labs 32 voice Wavetable sound (Platinum SE models)
- ◆ Zy-Fi® 2 amplified stereo speaker system for crystal clear audio
- ◆ Choice of Microsoft Media 97 bundle or Lotus Multimedia Office 96

Some items are already included as standard in some Vale models, and the price of the multimedia upgrades reflects this.

We offer a full range of multimedia packs and products, any of which can be specified with your Vale PC, see page 32 for full details. Please note that bundled versions of software and sound cards 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 manufacturers.

CALL: 01386 765500 FAX: 01386 765354 Email: sales@evesham.co.uk Web: http://www.evesham.com

Vale Prima

now with

16Mb RAM Standard!

COMPUTER SHOPPER

"Good specification, good performance and a good price." Vale Prima P133 December 1996



"Its quality and breadth make the Evesham well worth its asking price." Vale Prima P100

Vale Prima - Computer Shopper's "Best Buy"

Our Vale Prima PC is now established as a standard setting entry level PC, confirmed by winning Computer Shopper's "Best Buy" award when pitted against computers from 13 leading suppliers. We set out to build a quality PC and sell it at a keen price, whilst still offering a standard of equipment that allows us to maintain our award winning level of service and support. It's motherboard is based on the latest Intel 430 PCset and features 256kb of pipeline burst cache (almost unheard of at this price). The beauty of this PC is that it is capable of expanding with your needs - who knows in a years time your P120 might have grown into a P200 with a mountain of EDO RAM.

- ♦ Integrated motherboard with Intel 430 PCset
- ♦ Choice of 686 or Intel Pentium® processor
- ♦ Intel socket 7 for processor upgrades
- ♦ 4xPCI & 3x16-bit expansion slots
- ♦ 1Gb Seagate mode 4 IDE hard disk drive with PCI controller
- ♦ 16Mb EDO RAM (expandable to 128Mb)
- ♦ 256kb Pipeline-Burst cache
- ♦ 1 EPP parallel port and 2 serial ports with 16550 UART
- ♦ 1Mb PCI video card
- ♦ 14" Viewsonic E641 monitor (0.28mm dot pitch)
- ♦ 3.5" 1.44Mb floppy disk drive
- ♦ Multimedia models include a Panasonic CR-583 eight speed CD-

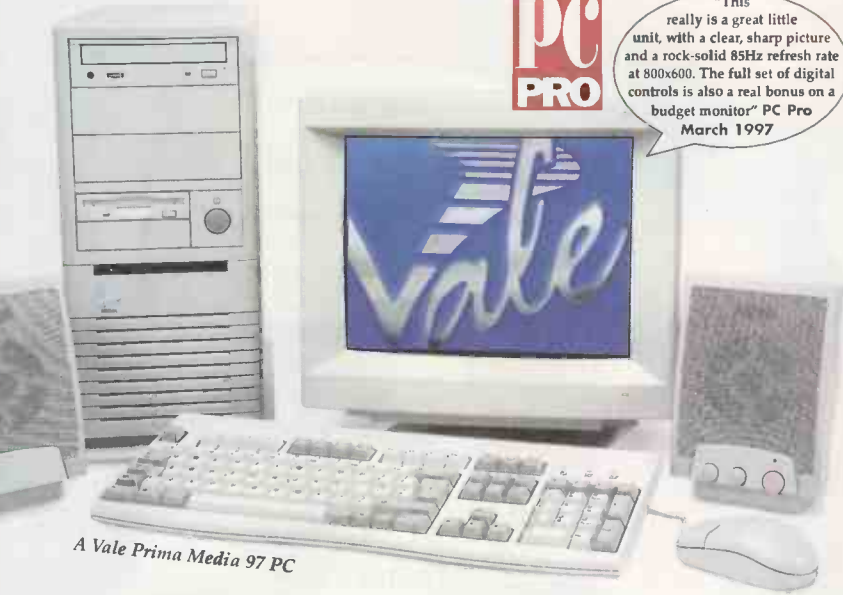
- ♦ ROM drive, 16 bit SoundBlaster compatible audio, and Zy-Fi 2 speakers
- ♦ Midi-tower style case
- ♦ TÜV approved power supply with low noise fan
- ♦ Mitsumi mouse and 'Windows95' keyboard
- ♦ Includes your choice of either Windows95, or MS-DOS 6.22 and Windows for Workgroups 3.11. Full manuals and disks supplied. "Introduction to Windows" manual supplied with Windows/Workgroups 3.11
- ♦ 14 day moneyback guarantee
- ♦ 1 year On-Site Maintenance for parts and labour
- ♦ Lifetime technical support hotline
- ♦ 10 year labour warranty

Each system includes your choice of Windows 3.11 or Windows 95 at no extra cost. Or you can upgrade to Windows NT 4 instead for £75***



With latest intel 430 PCset

MMX intel inside pentium® from £899



PC PRO

"This really is a great little unit, with a clear, sharp picture and a rock-solid 85Hz refresh rate at 800x600. The full set of digital controls is also a real bonus on a budget monitor" PC Pro March 1997

PRIMA MODELS

Model	Processor	RAM	Standard Price	Office97 Consumer Price	Office97 Business Price
P120	pentium	1.0Gb	£699+VAT (€901.33)	£889+VAT (€1044.58)	£939+VAT (€1103.33)
P133	pentium	1.0Gb	£729+VAT (€956.56)	£894+VAT (€1060.45)	£969+VAT (€1138.56)

PRIMA MMX MODELS

Model	Processor	RAM	Standard Price	Office97 Consumer Price	Office97 Business Price
P166	pentium	1.0Gb	£899+VAT (€1066.33)	£1089+VAT (€1279.58)	£1139+VAT (€1338.33)

PRIMA 686 MODELS

Model	Processor	RAM	Standard Price	Office97 Consumer Price	Office97 Business Price
P166+	686	1.0Gb	£719+VAT (€944.85)	£884+VAT (€1058.76)	£959+VAT (€1126.85)

PRIMA OPTIONS

- SEE BELOW FOR OTHER UPGRADES TO YOUR VALE SYSTEM**
- 32Mb RAM instead of standard 16Mb.....£70+VAT (€82.28)
 - 33600bps internal Vale voice/fax/data modem (requires Windows 95).....£59+VAT (€69.33)
 - Upgrade to 15" Studioworks 15 monitor.....£75+VAT (€88.13)
 - Upgrade to 15" Iiyama Vision Master 15 monitor (as Vale Prestige).....£95+VAT (€111.63)
 - Eight speed CD-ROM drive.....£55+VAT (€64.63)
 - Multimedia Labs TC1500 speaker upgrade (Prima multimedia models).....£39+VAT (€45.83)
 - "Internet ready" pack (requires Windows 95 - see below).....£159+VAT (€186.83)
 - Basic installation/training service.....£50+VAT (€58.75)
 - Extended on-site maintenance.....see below

Vale Internet Solution

At last a complete Internet Solution!

Many packages offer 30 day trial access often with limited access times and leading to high monthly charges. At Evesham Micros we believe in providing a product which is ready to use minutes after you open the box. Join the internet revolution safe in the knowledge that you will have nothing to pay (apart from local rate telephone calls) for 12 months.



- Choice of Vale 33600bps internal* or external voice/fax/data modem * not suitable for Windows 3.x
- 'Supervoice' voice/fax software
- 12 Months UNLIMITED Internet Access via Premier Internet - one of the UK's largest providers
- 100% UK local rate telephone access
- Full e-mail account
- Full technical support
- Includes all cables

Internal£159+VAT (€186.83)
External...£185+VAT (€217.38)

Vale Storage & Backup

zip drive

Zip drive works just like a hard drive, but the 100Mb cartridges give it unlimited expansion potential. Available as either an internal or a stand alone unit - the stand alone unit simply plugs into your parallel port in an instant, with a through port for printer operation.

- ♦ Includes one 100Mb cartridge, and Zip tools software to help you organise your data
- ♦ Highly portable external unit: (180x137x38mm, 450g)

Internal*£75+VAT (€86.13) Cartridge£14+VAT (€16.45)
External...£119+VAT (€138.83) Cartridge...6 pack £60+VAT (€70.50)
*Only available fitted to a Vale PC

ditto tape drives

Crash insurance for your PC

Internal unit fitted to your Vale PC for easy one-step backup

2Gb£85+VAT (€99.88) 3.2Gb...£105+VAT (€123.38)
Tapes...3 pack £59+VAT (€69.33) Tapes.....£29+VAT (€34.08)

Quoted capacities are with compression software supplied

jaz drive

The ultimate solution for storing, transporting and playing multimedia applications. Or backup your entire hard disk. Or create your own digital photo album. Or transport huge graphics files to printers and service bureaus. Just use as many cartridges as you need.

At last - a 1Gb portable solution.

- ♦ Includes one 1Gb cartridge, and Jaz tools software to help you organise your data
- ♦ Light weight (approx 900g) and compact (203 x 137 x 38mm) external unit
- ♦ Requires SCSI interface card

Internal£300+VAT (€352.50)
External...£365+VAT (€428.88)
1Gb cartridge£99+VAT (€104.58)
PCI SCSI Interface card£80+VAT (€94.00)



Prestige

now with

16Mb RAM Standard

iiyama Vision Master 15 monitor



DIAMOND MULTIMEDIA Stealth 3D 2000

Vale Prestige – for a little bit more...

It is amazing what spending a few more pounds can do to the performance and pleasure of use of a PC. By fitting the 2Mb version of the latest Diamond Stealth 3D Video card and coupling it with the superb 15" iiyama monitor, the specification and performance truly earn the title "Prestige".

- Choice of 686, Intel Pentium® or Pentium® Pro processor
- Intel 430 PCIset (Prestige Pentium & 686) or Intel 440 PCIset (Prestige Pro)
- Intel socket 7 (Prestige Pentium & 686) or socket 8 (Prestige Pro) for processor upgrades
- 4xPCI & 3x16-bit expansion slots
- 16Mb EDO RAM, expandable to 128Mb
- 256kb Pipeline-Burst cache
- 1.2Gb Seagate Medalist mode 4 IDE hard disk drive with PCI controller
- 1 EPP parallel port and 2 serial ports with 16550 UART
- 2Mb Diamond Stealth 3D 2000 PCI video card
- 15" iiyama Vision Master 15 monitor
- 3.5" 1.44Mb floppy disk drive
- All models have 16 bit SoundBlaster compatible audio
- Multimedia models include a Panasonic CR-583 eight speed CD-ROM drive and Zy-Fi 2 speakers
- Choice of desktop or midi-tower case
- TÜV approved power supply with low noise fan
- Mitsumi mouse
- Keytronic "Phoenix" Windows 95 keyboard
- Includes your choice of either Windows 95, or MS-DOS 6.22 and Windows for Workgroups 3.11. Full manuals and disks supplied. "Introduction to Windows" manual supplied with Windows/Workgroups 3.11
- 14 day moneyback guarantee
- 1 year On-Site Maintenance for parts and labour
- Lifetime technical support hotline
- 10 year labour warranty



"A polished PC that's also great value thanks to the bargain pricing of the 166MHz Pentium MMX." Vale Prestige MMX P166 March 1997



"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." Vale Prestige multimedia PC August 1996



"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" Vale Prestige multimedia PC November 1996



"For the price you get a well-made computer from a reputable supplier, with a good mix of software." Vale Prestige P133 November 1996

PRESTIGE OPTIONS

SEE BELOW FOR OTHER UPGRADES TO YOUR VALE SYSTEM

Windows NT 4 instead of DOS & Windows 3.11/95 (supplied on CD-ROM).....	£75+VAT	(£88.13)
32Mb RAM instead of standard 16Mb.....	£70+VAT	(£82.25)
33600bps internal Vale voice/fax/data modem (requires Windows 95).....	£59+VAT	(£69.33)
17" iiyama Vision Master 17 monitor (as Platinum SE).....	£260+VAT	(£305.50)
Matrox Millennium 2Mb video card.....	£60+VAT	(£70.50)
Matrox Millennium upgrade to 4Mb.....	£80+VAT	(£94.00)
Eight speed CD-ROM drive.....	£55+VAT	(£64.63)
Multimedia Labs TC1500 speaker upgrade (Prestige multimedia models).....	£39+VAT	(£45.83)
"Internet ready" pack (requires Windows 95 – see page 3).....	£159+VAT	(£186.83)
Basic installation/training service.....	£50+VAT	(£58.75)
Extended on-site maintenance.....	see below	



PRESTIGE MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.				
P133	Standard	Media 97	Office97 Consumer	Office97 Business
1.2Gb	£869+VAT (£1021.06)	£994+VAT (£1167.95)	£1019+VAT (£1197.33)	£1069+VAT (£1256.08)

2.1Gb Medalist Add £50+VAT (£58.75) to the price of 1.2Gb models
2.5Gb Medalist Pro Add £100+VAT (£117.50) to the price of 1.2Gb models

PRESTIGE MMX MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.				
P166	Standard	Media 97	Office97 Consumer	Office97 Business
1.2Gb	£1049+VAT (£1232.58)	£1174+VAT (£1378.45)	£1199+VAT (£1408.83)	£1249+VAT (£1467.58)
P200	Standard	Media 97	Office97 Consumer	Office97 Business
1.2Gb	£1199+VAT (£1408.83)	£1324+VAT (£1585.70)	£1349+VAT (£1585.08)	£1399+VAT (£1643.83)

2.1Gb Medalist Add £50+VAT (£58.75) to the price of 1.2Gb models
2.5Gb Medalist Pro Add £100+VAT (£117.50) to the price of 1.2Gb models

PRESTIGE 686 MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.				
P166+	Standard	Media 97	Office97 Consumer	Office97 Business
1.2Gb	£869+VAT (£1021.06)	£994+VAT (£1167.95)	£1019+VAT (£1197.33)	£1069+VAT (£1256.08)

2.1Gb Medalist Add £50+VAT (£58.75) to the price of 1.2Gb models
2.5Gb Medalist Pro Add £100+VAT (£117.50) to the price of 1.2Gb models

PRESTIGE PRO MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.				
P200	Standard	Media 97	Office97 Consumer	Office97 Business
1.2Gb	£1329+VAT (£1561.58)	£1454+VAT (£1708.45)	£1479+VAT (£1737.83)	£1529+VAT (£1796.58)

2.1Gb Medalist Add £50+VAT (£58.75) to the price of 1.2Gb models
2.5Gb Medalist Pro Add £100+VAT (£117.50) to the price of 1.2Gb models



A Vale Prestige PC with optional CD-ROM drive

Vale Warranty

- Extend your on-site maintenance cover to 2 or 3 years for complete peace of mind
- Scheme operated through Novasure – a division of Hitachi Credit (UK) PLC – and underwritten by Cornhill Insurance PLC
- Applicable to any Vale PC except notebook models (see page 9 for notebooks)

FOR PCs UP TO £1700+VAT

SECOND YEAR	£69
SECOND AND THIRD YEAR	£99

FOR PCs FROM £1700+VAT TO £2500+VAT

SECOND YEAR	£89
SECOND AND THIRD YEAR	£129

SEE PAGE 9 FOR NOTEBOOK RATES

Vale Finance

Finance available subject to status. Written details available upon request.

ACCOUNT FACILITIES

- Available to qualified commercial customers – please call for details

BUSINESS RENTAL SCHEME

- Flexible lease agreement available to qualified commercial customers
- Please call for full details

Example:

Platinum SE Ivo P2002.5Gb Microsoft Media 97 PC	per month inc VAT
£67.05	

1 year term payable quarterly by direct debit. Other terms are available – please call for details.

FLEXIBLE PERSONAL FINANCE

- No deposit required
- APR 18.5%
- Repay over 12, 24, or 36 months
- Available for any purchase over £500 (12 month term), £750 (24 month term) or £1000 (36 month term)
- See the following pages for further example rates, or call for a quote

Example:

Prima P1201Gb Microsoft Media 97 PC	per month inc VAT
£36.28	

No deposit, 36 monthly payments, APR 18.5%. Total payable £1306.88 inc VAT. (Each price £1015.20 inc VAT).

Evesham Micros Visit your nearest Showroom at EVESHAM • CAMBRIDGE • BIRMINGHAM • MILTON KEYNES

Vale Platinum

now with **512kb Pipeline-Burst cache** (Pentium models) & **iiyama monitor**

Vale Platinum: the reviewer's favourite.

The Vale Platinum demonstrates our ability to keep offering a product at the forefront of leading technology. The continued review success for this range shows that we just keep getting it right!

- ◆ Latest ATX style motherboard and case for easy expansion and upgrades
- ◆ Latest Intel 430HX PCiset - improves upon the 430FX PCiset by supporting all the features essential to power users, such as large EDO memory arrays and PCI bus mastering IDE
- ◆ New Matrox Mystique 3D multimedia video accelerator (2Mb)
- ◆ Panasonic CR-584 twelve speed CD-ROM drive
- ◆ See Platinum SE page (right) for detailed specification

PLATINUM MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.

	Standard	Office97 Consumer	Office97 Business
P133			
2.5Gb	£1069+VAT	£1134+VAT	£1209+VAT
3.2Gb	£1119+VAT	£1184+VAT	£1259+VAT

PLATINUM MMX™ MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.

	Standard	Office97 Consumer	Office97 Business
P166			
2.5Gb	£1249+VAT	£1339+VAT	£1389+VAT
3.2Gb	£1299+VAT	£1389+VAT	£1439+VAT
P200			
2.5Gb	£1399+VAT	£1489+VAT	£1539+VAT
3.2Gb	£1449+VAT	£1539+VAT	£1589+VAT

PLATINUM PRO MODELS

See page 1 for details of multimedia packs. Prices highlighted in yellow indicate "Ready to Ship" models which we try to keep in stock for immediate despatch.

	Standard	Office97 Consumer	Office97 Business
P200			
2.5Gb	£1489+VAT	£1579+VAT	£1629+VAT
3.2Gb	£1539+VAT	£1629+VAT	£1679+VAT

PLATINUM OPTIONS

SEE PAGE 3 FOR OTHER UPGRADES TO YOUR VALE SYSTEM

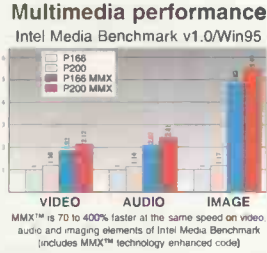
No CD-ROM drive.....	deduct £69+VAT (021.08)
No modem (SE models).....	deduct £59+VAT (045.33)
Windows NT 4 instead of DOS & Windows 3.11/95.....	£75+VAT (088.13)
Upgrade from 256kb to 512kb cache (All Pro models).....	£475+VAT (058.13)
Upgrade from 16Mb to 32Mb EDO RAM (Platinum/Pro).....	£70+VAT (082.25)
Upgrade from 16Mb to 64Mb EDO RAM (Platinum/Pro).....	£270+VAT (0217.25)
Upgrade from 32Mb to 64Mb EDO RAM (SE models).....	£200+VAT (0235.00)
4Gb SCSI hard disk instead of 2.5Gb IDE.....	£649+VAT (0762.58)
Matrox Mystique upgrade to 4Mb graphics RAM.....	£65+VAT (076.38)
Matrox Millennium 2Mb video card (Platinum/Pro).....	£40+VAT (047.00)
Matrox Millennium upgrade to 4Mb.....	£80+VAT (094.00)
"Internet ready" pack - req. Windows 95, see page 3 (Platinum/Pro).....	£159+VAT (0186.83)
"Internet ready" pack - req. Windows 95, see page 3 (SE models).....	£90+VAT (0105.75)
Speaker upgrade to Multimedia Labs TC1500 (multimedia models).....	£39+VAT (045.83)
Speaker upgrade to Multimedia Labs TC1500 & SP7001 (multimedia models).....	£89+VAT (0104.58)
Basic installation/training service.....	£69+VAT (021.08)
Extended on-site maintenance.....	See page 4

MONITOR UPGRADES PLATINUM SE

17" iiyama Vision Master PC Magazine "Editors Choice" April '95.....	£260+VAT (0305.50)	N/A
17" iiyama Vision Master ES (built-in speakers and Spatializer 3D sound processor).....	£290+VAT (0340.75)	£30+VAT (035.25)
17" iiyama Vision Master Pro (0.25mm dot pitch DiamondTron tube).....	£300+VAT (0352.50)	£40+VAT (047.00)
21" iiyama Vision Master.....	£716+VAT (0841.30)	£456+VAT (0235.80)
21" iiyama Vision Master Pro.....	£746+VAT (0876.55)	£486+VAT (0571.05)



iiyama monitors
 In the last couple of years iiyama have taken the monitor world by storm, winning over 20 UK magazine awards for technical excellence, display quality and value for money. Many times "Editor's Choice", they are firmly established as the choice of the professional user too.
 iiyama Vision Master 15 - standard on Platinum models
 iiyama Vision Master 17 - standard on Platinum SE models



Up to **20%** increase in overall performance with standard applications
 Up to **400%** faster with MMX™ optimised applications

P166 and P200 models use Intel's new Pentium® processor with MMX™ technology for enhanced video, audio and communications performance.

FREE CD-ROM bundle with all Platinum MMX™ models - MMX™ enhanced versions of:

- Ultimate Human Body 2 visual learning guide with real-time 3D views
- Timetables of Technology rich visual history of the development of technology
- POD driving game
- Third Dimension 3D creativity tool
- Space Station simulator design, construct and explore your own space station

REVIEW SUCCESS



"The Vale Platinum is a beautiful PC. The whole design, from case to motherboard, plus the 2Gb Seagate hard drive, impressed us. Evesham's build quality, plus the use of the Triton II chipset, shows up in performance." August 1996 Vale Platinum 133



"This PC turned in a blindingly fast performance in our labs. Evesham impressed in every area, and had all the mod cons such as an ATX format motherboard and Matrox Mystique 3D graphics card. A great PC to own." February 1997 Vale Platinum 200



"The Evesham is consistently the best performer in this set. It has the most up-to-the-minute technology. Its speed and great attention to detail make it well worth the price." November 1996 Vale Platinum 200



"The construction quality and internal layout of the midi tower case are exemplary. The Platinum 200 is good to look at and easy to use... it's hard not to like this PC." January 1997 Vale Platinum 200



"The Evesham Micros package is a good all-round system from a well known supplier... we have no hesitation in awarding it a PC Plus Gold." January 1997 Vale Platinum 133



"Evesham Micros has yet again produced a high quality and well specified machine... build quality is good and the supporting components are impressive" November 1996 Vale Platinum 166

PC Guide

Long term test: "Still good looking, even after our thorough testing, the Evesham Micros Vale Platinum looks as though it is a true winner." Impressively, the support line was answered immediately and we were put straight through to a technician... and 10 minutes after encountering the problem it was solved." February 1997 Vale Platinum 133





Platinum SE

now with **512kb Pipeline-Burst cache** (Pentium models) & **iiyama monitor**

Vale Platinum SE: the power user's dream.

By enhancing the already highly specified Vale Platinum, we have created the computer that answers the dreams of the most demanding users.

REVIEW SUCCESS



"consistently among the best performers in PC Labs' tests, with notably good graphics and disk WinMark results...outstripping the others on price and features, was our Editors' Choice, the Evesham Vale Platinum HXse Pro." **November 1996**
Vale Platinum SE Pro 200



"In our tests the Evesham performed superbly thanks to a decent configuration...Build quality is exceptional...Aspiring PC manufacturers should get hold of one of Evesham's machines to see how it's done." **October 1996**
Vale Platinum SE 166



"First place went to the Evesham Micros unit which was boosted to it's top position by the best performance results...excellent value for money." **October 1996**
Vale Platinum SE 166



"Evesham has another good-looking, high performer in its MMX Platinum." Verdict: 9/10.
March 1997
Vale Platinum SE



"Evesham's machine is a good competitor and you'd be well advised to add it to your short, short-list."
November 1996
Vale Platinum SE 200



"The Vale Platinum SE gave a good account of itself in both the high-end tests and the PhotoDeluxe MMX test. With a generous games/multimedia bundle, plus an internal 33.6kbps modem, it's good value for money."
March 1997
Vale Platinum SE 200



"The high spec and resultant speed of this machine made it a clear winner, offering the best value for money of the bunch." **March 1996**
Vale Platinum SE 150



"This month, just one system has been rated as so outstanding that it has been awarded a PC Direct Best Buy award." **April 1996**
Vale Platinum SE 166

Standard Platinum features (see top right for Platinum SE enhancements):

Motherboard

- Intel Tucson ATX motherboard with Intel 430HX PCliset and Intel socket 7 for processor upgrades (Platinum models)
- Intel Venus ATX motherboard with Intel 440FX PCliset and Intel socket 8 for processor upgrades (Pro models)
- Support for Windows95 'plug and play' environment
- Support for native signal processing
- Flash BIOS
- 3x PCI, 1xPCI/16-bit & 2x16-bit expansion slots

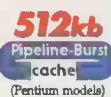


Processor

- Intel Pentium® processor (Platinum P133)
- Intel Pentium® processor with MMX™ technology (Platinum P166/200)
- Intel Pentium® PRO processor (Pro models)

Cache & RAM

- 16Mb EDO RAM, expandable to 128Mb, & 512kb Pipeline-Burst cache (Platinum models)
- 16Mb EDO RAM, expandable to 256Mb, & 256kb Pipeline-Burst cache (Platinum Pro models)



Hard Disk

- Seagate Medalist (3.2Gb) enhanced IDE hard disk
- Seagate Medalist Pro (2.5Gb and 5Gb). Medalist Pro is the fastest IDE hard disk we have yet seen - Internal Data Transfer Rate: 116Mb/sec Average access time: 12 msec
- On-board PCI hard disk controller



August 1996
Seagate Medalist hard disk



"The best E-IDE performance comes from the Seagate Medalist Pro ST32520A in the Evesham Vale Platinum P200." **January 1997**

Case

- High quality ATX style case with good access for upgrades and expansion (no tools required)
- Choice of desktop or midi-tower case
- 1x5.25" and 2x3.5" external drive bays free (midi-tower) or 2x5.25" external drive bays free (desktop) in standard configuration
- TÜV approved power supply with low noise fan

Operating System

- Includes your choice of either Windows95, or MS-DOS 6.22 and Windows for Workgroups 3.11. Full disks and manuals supplied. "Introduction to Windows" manual supplied with Windows for Workgroups 3.11
- Or upgrade to Windows NT 4 instead at a cost of £75+VAT (+£88.13)



MICROSOFT WINDOWS NT... READY-TO-RUN

Warranty

- 14 day moneyback guarantee
- 1 year On-Site Maintenance for parts and labour
- Lifetime technical support
- 10 year labour warranty

KEY TRONIC® Keyboard

"It has one of the best weighted and most comfortable set of keys of any mainstream keyboard and with its well raked rows and full Win95 compatibility, it gets our top vote." **PC Plus, January 1997**

Microsoft® IntelliMouse

with the wheel for easy zooming and scrolling in MS 97 applications.

Video

- Matrox Mystique 3D multimedia accelerator with 2Mb synchronous graphics RAM
- iiyama Vision Master 15 monitor



February 1997
Matrox Mystique



"Best Graphics Card" Matrox Millennium

Ports

- EPP and ECP capable printer port
- 2x16550 compatible UART driven high speed serial ports

Keyboard & Mouse

- Keytronic 'Windows 95' PS/2 keyboard
- Microsoft IntelliMouse (PS/2)

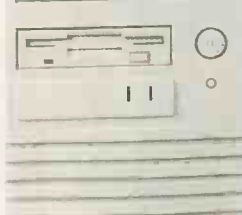
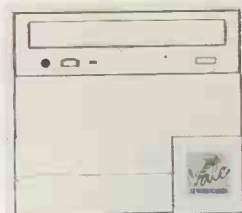
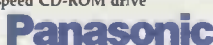
Sound

- Yamaha on-board 16 bit sound chip (Platinum models)
- Creative Labs Vibra 16 sound card (Pro models)
- Multimedia models have Zy-Fi® 2 amplified speakers - or upgrade to Multimedia Labs speakers, see left



CD-ROM & Floppy drive

- Panasonic CR-584 twelve speed CD-ROM drive
- Panasonic 3.5" 1.44Mb floppy disk drive



The Platinum SE has the following enhancements to the standard Platinum:

- 32Mb EDO RAM
- Matrox Millennium professional graphics accelerator (2Mb WRAM)
- iiyama Vision Master 17 monitor
- Creative Labs 32 voice Wavetable sound upgrade
- 33600bps internal voice/fax/data modem
- See below for detailed Platinum specification

PLATINUM SE MODELS

Model	Standard	Office97 Consumer	Office97 Business
P133	2.5Gb £1499+VAT (£1761.33)	Office97 £1564+VAT (£1837.70)	Office97 £1589+VAT (£1925.83)
	5.0Gb £1699+VAT (£1998.33)	Office97 £1764+VAT (£2072.70)	Office97 £1789+VAT (£2102.08)

PLATINUM SE MMX™ MODELS

Model	Standard	Office97 Consumer	Office97 Business
P166	2.5Gb £1679+VAT (£1972.83)	Office97 £1744+VAT (£2046.20)	Office97 £1769+VAT (£2078.58)
	5.0Gb £1879+VAT (£2207.83)	Office97 £1944+VAT (£2384.20)	Office97 £1969+VAT (£2319.58)
P200	2.5Gb £1829+VAT (£2149.08)	Office97 £1894+VAT (£2225.45)	Office97 £1919+VAT (£2254.83)
	5.0Gb £2029+VAT (£2384.08)	Office97 £2094+VAT (£2480.45)	Office97 £2119+VAT (£2489.83)

PLATINUM SE PRO MODELS

Model	Standard	Office97 Consumer	Office97 Business
P200	2.5Gb £1919+VAT (£2254.83)	Office97 £1984+VAT (£2331.20)	Office97 £2009+VAT (£2360.58)
	5.0Gb £2119+VAT (£2489.83)	Office97 £2184+VAT (£2566.20)	Office97 £2209+VAT (£2595.58)

SEE LEFT FOR PLATINUM SE OPTIONS

March's Special Offers:

- Platinum MMX P166/2.5Gb Media 97 PC with
 - Vale 33600bps internal modem
 - Multimedia Labs TG1500 & SPT001 speaker system (see page 12)
 - Omega Zip drive
 - Windows 95
- £1499+VAT** Save £38

- Platinum SE MMX P200/3.2Gb Media 97 PC with
 - Multimedia Labs TG1680 speaker system (see page 12)
 - Iiyama Vision Master 17 Pro monitor upgrade
 - Microsoft Office 97
 - Omega Zip drive
 - Windows 95
- £2249+VAT** Save £168



A Vale Platinum SE with optional Omega Zip drive

Vate Professional NT Workstations

A Timely Move Into The NT Workstation Market!

Winners of PC Magazine's highly prized 'Editor's Choice' for the 200MHz Pentium Pro model, Evesham's qualifications to provide the optimum configuration at realistic prices are obvious. Having already supplied many customers with sophisticated workstation-class machines, launching the Professional Workstation range was a natural progression.

The workstation sector of the market has traditionally been the haven of computer giants such as Sun and Silicon Graphics. However, by making its products more competitive and readily available, Intel has opened up this stronghold of the market to the smaller, quality manufacturers.

Professional 3D graphics accelerators

matrox

Matrox Millennium

Winner of many International awards, the Millennium is now firmly established as the choice for the budget conscious graphics professional.

"Best Graphics Card"
Matrox Millennium



Fire GL 3000

Professional 3D graphics solution for animation and design



OpenGL

- High performance GLiNT 500TX 3D rendering & texture processor
- Combines the proven rendering engine of the 3DLabs' GLiNT 500TX processor with the new Delta geometry setup engine to boost 3D performance over conventional rendering engine-only solutions.
- GLiNT 500TX 3D rendering processor - Supports texture mapping and double buffering necessary for high frame rates in hardware. 100% OpenGL compliant with 500k 25 pixel Gouraud shaded depth buffered triangles/sec. Features: Real-time video textures using shared local buffer interface, On-chip texture cache, Gouraud shading, Z-buffering, Anti-aliasing, Dithering, Depth cueing and fog, Alpha blending, Specular blending, Fast Z-buffer and display buffer clear, Trilinear and bilinear filtering.

- 100% OpenGL compatible
- Provides high-resolution, True Colour 3D graphics at ergonomic refresh rates for OpenGL applications.
- Diamond dual screen technology supports up to two monitors with two high performance 220MHz IBM LUT DACs
- Up to 8Mb VRAM/32Mb DRAM
- Optimised for these applications: 3D Studio MAX, Softimage 3D, AutoCAD and Mechanical Desktop, MicroStation 95, Pro/Engineer, IDEAS, Openinventor-Toolkit, Sense 8 World Toolkit

General features

Cache & RAM

- 256kb level 2 Pipeline-Burst cache (Millennium model)
- 512kb level 2 Pipeline-Burst cache (GL 3000 model)
- EDO RAM (using DIMMs), expandable to 512Mb

LAN system

- On-board 10/100Base-T PCI ethernet (RJ45 connector)

CD-ROM & Floppy drive

- Panasonic CR-583 eight speed CD-ROM drive
- Panasonic 3.5" 1.44Mb floppy disk drive

Ports

- 2x Universal Serial Bus (USB) interfaces
- EPP and ECP capable parallel port
- Serial port
- PS/2 mouse & keyboard ports

Sound

- On-board Crystal 16 bit sound chipset (SoundBlaster compatible)
- Game port and audio jacks
- Wavetable upgradeable

Operating system

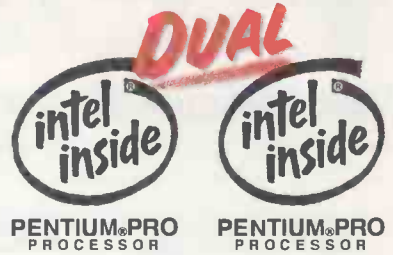
- Microsoft Windows NT 4

Keyboard & Mouse

- Keytronic Windows 95 PS/2 keyboard
- Microsoft mouse 2.0 (PS/2)

Case

- High quality ATX style case with good access for upgrades and expansion (no tools required)
- Choice of desktop or mid-tower case
- 1x5.25" and 2x3.5" external drive bays free (mid-tower) or 2x5.25" external drive bays free (desktop) in standard configuration
- TUV approved power supply with low noise fan



Dual Pentium Pro processor support

- Intel Providence ATX motherboard with Intel 440FX PCIset
- Support for dual Pentium PRO processors
- 3x PCI & 1xPCI/16-bit expansion slots
- 2x bus-mastering PCI IDE interfaces
- Ultra wide PCI SCSI Interface
- Connector for infrared (IrDA) transceiver



High performance hard disk

- Seagate Barracuda ultra wide SCSI hard disk
- 4Gb & 9Gb options
- Average access time 9.9ms
- Data transfer rate up to 40Mbit/sec



Warranty & Support

- 14 day moneyback guarantee
- 1 year On-Site Maintenance for parts and labour (please call for details of extended on-site maintenance)
- Lifetime technical support
- 10 year labour warranty

Dual monitor support

All models have dual monitor support - ideal for making the most of design, financial modelling etc.



GL 3000 NT Workstation with optional second 21" monitor

iiyama monitors

In the last couple of years iiyama have taken the monitor world by storm, winning over 20 UK magazine awards for technical excellence, display quality and value for money. Many times "Editor's Choice", they are firmly established as the choice of the professional user too.



April 1995
Vision Master 17

Illustrative configurations:

NT WORKSTATION MODELS

	Millennium/256	GL 3000/512
Processor	1x 200MHz Pentium Pro	1x 200MHz Pentium Pro
Hard disk	4Gb ultra wide SCSI	4Gb ultra wide SCSI
RAM	64Mb EDO	128Mb EDO
Video card	Matrox Millennium 4Mb WRAM	Diamond Fire GL 3000 8Mb VRAM, 32Mb DRAM
Monitor	iiyama Vision Master 17	iiyama Vision Master 21
	£2939+VAT (£3453.33)	£6214+VAT (£7301.45)

Please contact your nearest Corporate Sales Centre (see right) to quote for your specific requirements.

Vale Fileservers

Vale Fileservers offer a cost effective solution with the flexibility to meet your requirements

Pentium® processor models:

- ◆ ATX style motherboard with Intel 430 PCset and 256kb Pipeline-Burst cache
- ◆ Dedicated server case available at extra cost (see options)

Pentium® PRO processor models:

- ◆ ATX style motherboard with Intel 440FX PCset and 256kb integrated cache

Dual Pentium® PRO processor models:

- ◆ Intel Providence ATX style motherboard with Intel 440FX PCset and 256kb integrated cache per processor

All models:

- ◆ Ultra Wide SCSI hard disk
- ◆ Adaptec 2940 PCI SCSI controller
- ◆ Six speed SCSI CD-ROM drive
- ◆ TÜV approved power supply with low noise fan
- ◆ Midi tower style case (illustrated)
- ◆ Choice of operating system available at extra cost (see options)
- ◆ 3COM 10/100Mbps PCI ethernet card
- ◆ 1Mb PCI video
- ◆ 14" SVGA monitor
- ◆ 1 year on-site maintenance



June 1996
"Business NT servers"
Vale Fileserver

adaptec
PCI SCSI controller

Example: P133 fileserver:

BUSINESS RENTAL SCHEME
£52.04 +VAT per month



A Vale Fileserver

Dedicated server case:

- ◆ Twin redundant PSU system
- ◆ 12 drive bays
- ◆ Lockable access cover



The optional dedicated server case (Pentium models only)

FILESERVER MODELS

Processor	RAM	Hard Disk	Price
Pentium P133	16Mb	4Gb	£1570 ^{+VAT} (£1844.75)
Pentium P166	16Mb	4Gb	£1755 ^{+VAT} (£2062.19)
Pentium PRO P200	32Mb	4Gb	£2200 ^{+VAT} (£2585.00)
Dual Pentium PRO P200	64Mb	4Gb	£2740 ^{+VAT} (£3219.50)

FILESERVER OPTIONS

Upgrade from 16Mb to 32Mb EDO RAM.....	£70 ^{+VAT} (£82.25)
Upgrade from 16Mb to 64Mb EDO RAM.....	£270 ^{+VAT} (£317.25)
Upgrade from 32Mb to 64Mb EDO RAM.....	£200 ^{+VAT} (£235.00)
4Gb DAT drive	£650 ^{+VAT} (£763.75)
Dedicated server case (Pentium models only).....	£300 ^{+VAT} (£352.50)
MS DOS 6.22 / Windows 3.11.....	£69 ^{+VAT} (£81.08)
MS Windows NT server software.....	£ CALL
MS Windows NT client software.....	£ CALL
Novell Netware client/server software.....	£ CALL
Network Support Helpdesk.....	£ CALL

Vale Samurai RAID server



A Vale Samurai RAID server



Closed view

The Vale Samurai RAID Server provides the ultimate solution to your mission critical system requirements. The standard DPT RAID controller and EDO RAM combine with the power of an Intel Pentium® Pro processor for high performance under both Windows NT and Netware. By utilising this industry proven technology you can be assured that your data integrity will be maintained. The following is a sample specification – please call us to discuss your requirements.

Samurai case:

- ◆ Twin redundant PSU system
- ◆ 12 external drive bays with caddy system
- ◆ Lockable front doors and access covers

- ◆ ATX motherboard with Intel 440FX PCset
- ◆ 200MHz Pentium® PRO processor
- ◆ 256kb integrated processor cache
- ◆ 64Mb EDO RAM
- ◆ DPT PCI RAID controller with 4Mb cache
- ◆ 10Gb or 20Gb RAID array (8Gb or 16Gb useable space)
- ◆ Eight speed SCSI CD-ROM drive
- ◆ 3COM 10/100Mbps PCI ethernet card
- ◆ 1Mb PCI video
- ◆ 14" SVGA monitor
- ◆ 1 year on-site maintenance
- ◆ Choice of operating system available at extra cost

DPT
PCI RAID controller

SAMURAI OPTIONS

4Gb DAT drive	£650 ^{+VAT} (£763.75)
MS DOS 6.22 / Windows 3.11.....	£69 ^{+VAT} (£81.08)
MS Windows NT server software.....	£ CALL
MS Windows NT client software.....	£ CALL
Novell Netware client/server software.....	£ CALL
Network Support Helpdesk.....	£ CALL

All Vale Servers are 100Mbps ready



PENTIUM® PRO PROCESSOR

10Gb array
£5030^{+VAT}
(£5910.25)

BUSINESS RENTAL SCHEME
£175.97 +VAT per month

20Gb array
£7070^{+VAT}
(£8307.25)

BUSINESS RENTAL SCHEME
£247.33 +VAT per month

BUSINESS RENTAL SCHEME

All figures quoted are for a 3 year term. Other terms are available – please call for details.

Vale Corporate & Network Services

These are just a few of the hundreds of companies who have benefited from dealing with Evesham Micros

DUNLOP LIMITED
SUSPENSIONS AND COMPONENTS

Snap-on

Beneficial LV GROUP

Information

SPECIAL EYES
QUALIFIED OPTICIANS

COMPUTERWEEKLY
Best "Product Knowledge of sales staff"
in "Quality of IT Suppliers 1995" survey.

Call us for network installation and support.

Call us for volume pricing

Microsoft
SOLUTION PROVIDER

Authorized by Microsoft

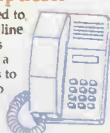
Microsoft
CERTIFIED PROFESSIONAL
Product Specialist

Novell
Authorised Reseller

Novell
CNE

Network Support Helpdesk

The Network Support Helpdesk is designed to offer telephone support as front or second line support for Network operating systems supplied by Evesham Micros, backed by a team of professionally qualified engineers to help you keep your network down time to a minimum and budget your support cost.



Corporate Sales Centres

EVESHAM 01386 769404

MILTON KEYNES 01908 230898

CAMBRIDGE 01223 323898

BIRMINGHAM 0121 446 5050

- Competitive pricing for everything from a single PC to a large network installation
- A single point of contact for all requirements from Evesham Micros
- A range of business finance options including leasing
- Account facilities available to qualified commercial customers

- Volume pricing available
- Unrivalled after sales service
- Detailed product knowledge and market-place awareness
- Personal, efficient and friendly service at the end of the telephone
- Fully trained sales staff conversant with Microsoft MOLP & Select programmes



Voyager II



Now a fast multimedia notebook can be slim and stylish!



WINDOWS 95
Windows 95 is installed and ready to run.



April 1996

"...commendably robust... Evesham Micros' excellent Seagate hard disk leaves others standing..."

It has better power management, it's better built and has a clearer screen... the Evesham's superior motherboard ties it all together for a faster system... a multimedia monster...
Vale Voyager II P90 Dual Scan Colour



May 1996

"A bit hefty, but solid. It also boasts several desirable features, such as the good quality, high-resolution screen, the mouse pad, and the option of either a CD-ROM or two memory-effect-free Lithium Ion batteries for longer operating times."
Vale Voyager II P90 Dual Scan Colour



Runner up: Pentium portables
Vale Voyager II



May 1996

"performance and power-saving options are extremely good...the fastest 90MHz Pentium notebook we have seen to date."
Vale Voyager II P90 TFT Colour



January 1996

"There's no going back to a 640x480 screen once you've spent any time using a notebook with this higher resolution."

BUILT-IN AUDIO

The Voyager II really is multimedia ready. It has 16 bit stereo sound built in, together with stereo speakers and microphone. There are jacks for an external speakers, and stereo line in/line out.

SECURITY

Anchor for Kensington security cable.

EXPANSION PORTS

The Voyager II has ZV-enabled PCMCIA ports for use with two type II cards or one type III card. Rear panel connectors include serial port (16550 compatible); EPP/ECP bi-directional parallel port; SVGA monitor, PS/2 mouse or keyboard, MIDI/game port, TV set, and infra red data link. A further port enables fast connection to a port replicator.

3.5" FLOPPY DRIVE

KEYBOARD

The Voyager II uses a full function 87-key keyboard with Windows 95 keys. Unlike many notebooks, it has a good solid feel.

HARD DISK

High performance enhanced IDE hard disk.

TOUCHPAD

The built in touchpad, with palm rest, controls the cursor effortlessly and accurately.

CPU, CACHE & RAM

Designed to low voltage Pentium processors, and fitted with 256kb asynchronous cache, the Voyager II offers superb performance with maximum battery life. 16Mb EDO RAM is fitted, and can be upgraded to a maximum of 64Mb.

This is a real screen shot, not simulated.



DISPLAY

The Voyager II has a choice of superb colour LCD displays, either 11.3" Dual Scan or 12.1" TFT active matrix. Both can display up to 800x600 SVGA with 64k colours. The display driver is a 64 bit PCI bus Windows accelerator with 2Mb video RAM. A port is provided for simultaneous connection to an external monitor (up to 1024 x 768 resolution) and there is a composite video output for connection to a suitable TV set (NTSC and PAL compatible).



10x CD-ROM DRIVE

With the built-in ten speed CD-ROM drive, the Voyager II is a self contained multimedia workstation.



BATTERY

The Voyager II uses the very latest Lithium Ion battery technology for long life and no 'memory effect'. The battery can be easily removed and replaced by a second unit. Extensive power management features include 'suspend to RAM' and 'suspend to disk' modes. The latter quickly saves your working environment to disk when the lid is closed, allowing you to re-load it later.

ZV-ENABLED

The Voyager II is ZV-enabled, with support for full-on multimedia such as full-screen MPEG and video capture



PORT REPLICATOR

Use the optional port replicator to give instant connection to all of the peripherals on your desk.

WARRANTY

The Voyager II has 12 months 'return to base' warranty covering parts, with a 10 year warranty on labour. See below for extended warranty options.

VOYAGER II OPTIONS

Additional primary battery.....	£159+VAT (£166.83)
Upgrade from 16Mb to 24Mb RAM	£69+VAT (£81.08)
Upgrade from 16Mb to 32Mb RAM	£129+VAT (£151.58)
Upgrade from 16Mb to 48Mb RAM	£250+VAT (£293.75)
Port replicator.....	£69+VAT (£81.08)
Additional PSU.....	£59+VAT (£69.33)
Car cigar lighter adaptor.....	£79+VAT (£92.83)
External keyboard.....	£29+VAT (£34.08)
Zy-Fi® 2 amplified speakers	£29+VAT (£34.08)

QUALITY & STYLE

The Voyager II is remarkably compact for the specification it offers, measuring 297 x 236 x 46mm and weighing 2.95kg. The quality of fit and finish is amongst the best we have ever seen.

NOTEBOOK ACCESSORIES

PCMCIA

33600bps Modem£139+VAT (£163.33)
Ethernet card£99+VAT (£116.33)

PCMCIA is the industry standard for expanding the capabilities of your notebook, whether it's a FAX/modem for a world of communications, or an ethernet card for talking to the rest of the office.



EXTENDED WARRANTY

For complete peace of mind you can now extend the warranty on your Voyager II or Quest to 2 or 3 years. The scheme is operated through Novasure - a division of Hitachi Credit (UK) plc - and underwritten by Cornhill Insurance plc.
Models up to £1700+VAT
2nd year...£89 2nd & 3rd year...£129
Models from £1700+VAT to £2500+VAT
2nd year...£109 2nd & 3rd year...£159
These rates are exempt from VAT and are applicable only at time of purchase.

11.3" Dual Scan Colour

1.4GB 2.1GB

P120	£1699+VAT (£1996.33)	£1799+VAT (£2113.83)
P133	£1749+VAT (£2055.08)	£1849+VAT (£2172.58)
P150	£1799+VAT (£2113.83)	£1899+VAT (£2231.33)

12.1" TFT Colour

1.4GB 2.1GB

P120	£2299+VAT (£2701.33)	£2399+VAT (£2818.83)
P133	£2349+VAT (£2760.08)	£2449+VAT (£2877.58)
P150	£2399+VAT (£2818.83)	£2499+VAT (£2936.33)

11.3" 16Mb

12.1" 16Mb

Vale Quest



Quest is a 2-in-1 design which really does combine the best of both worlds. The Notebook is light weight, sleek and sophisticated with good battery life. Adding the Base Station gives you all the features of a desktop PC at your fingertips.

STANDARD FEATURES

- ◆ 8Mb high performance EDO RAM, expandable to 40Mb.
- ◆ Enhanced IDE hard disk.
- ◆ 1.44Mb floppy drive
- ◆ Solid comfortable keyboard with Windows95 keys.
- ◆ Superbly responsive touchpad.
- ◆ Extensive power management features including "suspend to RAM" and "suspend to disk".
- ◆ IrDA compliant infrared port, with TranXit utility software for simple wireless communications.
- ◆ PCMCIA expansion ports for two type II cards or one type III card.
- ◆ Serial port (16550A compatible), parallel port (EPP and ECP compatible), PS/2 port for external mouse or keyboard, and port for external SVGA monitor (1024 x 768 resolution).
- ◆ Audio expansion jacks for stereo line in & line out, and an external microphone.
- ◆ Dual function, auto configuring joystick/MIDI port caters for a wide range of peripherals.
- ◆ Anchor for Kensington security cable.

LARGE SVGA DISPLAY

Large and clear 11.3" LCD display with 800x600 resolution and up to 256 colours (Dual Scan models) or near photographic 64,000 colours (TFT models).

This is a real screen shot, not simulated.

PCI VIDEO

High performance PCI bus video controller with 1Mb EDO RAM.

BUILT-IN AUDIO

On-board 16-bit stereo sound (SoundBlater Pro compatible) with built-in speakers and microphone.

MINIATURE POWER SUPPLY

A big, heavy power supply is a real millstone to a light weight notebook, but the Quest has a matchbox sized unit weighing just 200g. It's even auto sensing for supply voltage (90-260V).

MAXIMUM BATTERY LIFE

High performance Duracell battery and low voltage Pentium processor.

DURACELL

SUPER-LIGHT SLIM DESIGN

The Quest measures just 297mm x 236mm x 35mm and weighs only 2.5kg, making it one of the most portable notebooks around.

Designed for **WINDOWS 95**
Windows 95 is installed and ready to run.



Closed view

BASE STATION

SLIM AND LIGHT

The Base Station adds only 1.2kg to the weight of the notebook, making the combination no bigger and heavier than many conventional notebooks. The Quest's mains power supply even slots inside the Base Station so you don't have to carry it as a separate unit.

FAST DOCKING

Under Windows95 the Base Station is a Plug and Play device - you can 'hot dock' without switching off the notebook for instant expansion.

6X CD-ROM DRIVE

You can't afford to be without a CD-ROM drive these days, and with 6x speed technology the Quest lacks nothing in multimedia performance.



Quest with the Base Station

STANDARD FEATURES

- ◆ Full length PCI expansion slot.
- ◆ Two PS/2 ports for connection to an external keyboard and mouse.

AMPLIFIED SPEAKERS

Amplified stereo speakers with front volume control provide adequate sound for small audiences. Audio output ports are provided for further expansion.

Dual Scan Colour

	1.0GB	2.1GB
P120	£1349 ^{+VAT} (€1585.08)	£1449 ^{+VAT} (€1702.58)
P133	£1399 ^{+VAT} (€1643.83)	£1499 ^{+VAT} (€1761.33)

TFT Colour

	1.0GB	2.1GB
P120	£1799 ^{+VAT} (€2113.83)	£1899 ^{+VAT} (€2231.33)
P133	£1849 ^{+VAT} (€2172.58)	£1949 ^{+VAT} (€2290.08)

QUEST OPTIONS

Base Station.....	£399 ^{+VAT} (€468.83)
Additional primary battery.....	£195 ^{+VAT} (€229.13)
Upgrade from 8Mb to 16Mb RAM.....	£89 ^{+VAT} (€104.58)
Upgrade from 8Mb to 24Mb RAM.....	£149 ^{+VAT} (€175.08)
Upgrade from 8Mb to 40Mb RAM.....	£249 ^{+VAT} (€292.58)
Car cigar lighter adaptor.....	£79 ^{+VAT} (€92.83)
External keyboard.....	£29 ^{+VAT} (€34.08)
Zy-Fi® 2 Pro amplified speakers.....	£49 ^{+VAT} (€57.58)
Extended warranty.....	see panel, far left

Computer Luggage

Stylish, practical carry cases for your notebook and accessories.



Pisa £65^{+VAT} (€76.38)

Madrid £30^{+VAT} (€35.25)

Hamburg £50^{+VAT} (€58.75)

New York (back pack)
£35^{+VAT} (€41.13)

Vale Communications



Vale Plug-N-Play ethernet adaptor

The easiest and fastest installation with top-rated performance.

- NE2000 compatible ISA bus Plug-N-Play card
- RJ45 and BNC ports
- Full duplex operation to out-perform other NE2000 compatible cards by up to 30%



£19+VAT
(£22.33)

Over the years the Vale range of Personal Computers has built a reputation for performance products at competitive prices. Building on this success we have introduced a range of products designed to enhance your PC. Whether you require an NE2000 compatible network card, a 33600bps fax/modem or an FM radio, you can be sure that the quality and technical support will be second to none.

Vale PCI ethernet adaptor

This high performance 32-bit PCI Ethernet adaptor is suitable for a wide range of the network operating systems.

Vale's SP2080 32-bit PCI bus Ethernet adaptor provides the performance you need to keep up with today's fastest servers and workstations. It will cope with sensitive bandwidth applications while using less of your CPU resources, ideal for solving I/O bottlenecks.

- 32-bit PCI bus card
- Extensive driver support for all popular network operating systems
- RJ45 and BNC ports
- Full duplex operation for maximum performance



£39+VAT
(£45.83)

Vale 33600bps voice/fax/data modems

Whether you want to access the Internet or simply fax the office, a modem is an essential addition to any PC system. Our external unit means you just plug-in and go, and with the free software supplied you can be using the Internet within minutes of installation.

- 33600bps Voice/fax/data modem (PCMCIA version does not support voice functions)
 - Internal version **£75**-VAT (£88.13)
 - External version **£85**-VAT (£99.88)
 - PCMCIA version **£139**-VAT (£163.33)
- Low cost Internal 'Windows 95' version (Requires Pentium P100 minimum and Windows 95)
- 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
- Fax software
- Cables included



£59+VAT
(£69.33) 'Windows 95' version

Vale PCI etherspeed adaptor

The high performance 10/100 Mbps dual speed PCI Ethernet adaptor.

Vale's SP2500A EtherSpeed Ethernet adaptor provides the easiest way to adapt from 10 Mbps ethernet to 100 Mbps Fast Ethernet - just change the hub connection and the card will automatically run at the new speed.

- 32-bit PCI bus card
- 10Mbps and 100Mbps performance via RJ45 auto speed sensing port
- Extensive driver support for all popular network operating systems



£79+VAT
(£92.83)

Vale Internet solution

At last a complete Internet Solution!

Many packages offer 30 day trial access often with limited access times and leading to high monthly charges. At Evesham Micros we believe in providing a product which is ready to use minutes after you open the box. Join the internet revolution safe in the knowledge that you will have nothing to pay (apart from local rate telephone calls) for 12 months.

- Choice of external or 'Windows 95' internal 33600bps modem (see above)
- 12 Months **UNLIMITED Internet Access** via Premier Internet - one of the UK's largest providers
- 'Supervoice' voice/fax software
- 100% UK local rate telephone access
- Full technical support
- Full e-mail account
- Cables included

£159+VAT
(£186.83) 'Windows 95' version

External version... **£185**-VAT (£217.38)

Vale PCMCIA ethernet adaptor

Hastle free ethernet for your portable.

- RJ45 and BNC ports



£99+VAT
(£116.33)

Vale Plug-N-Play 3D Sound card

Discover a whole new world of sound.

A true 16-bit FM stereo sound card which is designed to provide wavetable-like sound quality with the latest 20voice/72 operator ESFM[®] music synthesizer. It has built-in duplex features, and incorporates the latest spatializer 3D sound system.

- Universal wavetable upgrade port
- 6 channel mixer
- Software audio utilities included
- Requires Plug-N-Play compatible motherboard
- Interfaces for ATAPI IDE CD-ROM and MIDI/Joystick



£29+VAT
(£34.08)

Vale Mini-Hub

The perfect answer for users who require a flexible, mobile networking product, this pocket-sized, 5 port hub is simple to install and easily expandable.

- 10BASE-T standard with 5 RJ45 ports
- Simple expansion by cascading up to 4 hubs
- Ideal for small workgroups
- No AC power adapter required - takes power from keyboard port via supplied cable



Rear view with 5 ports and DC input.

£45+VAT
(£52.88)

Vale FM stereo radio receiver

Within minutes of connecting the NEW Vale FM Radio to your multimedia PC, you can tune to your favorite station via a user-friendly interface.

- Simple Plug-N-Play installation: connects to 25-pin serial port, no external power required
- Ultra sensitive shielded antenna
- User friendly Windows 3.1 and Windows 95 compatible software to control all radio functions



£29+VAT
(£34.08)

Vale Cabling & Terminators

Ethernet Cable, per metre £0.75 -VAT (€0.88)	BNC T Connector £3.20 -VAT (€3.76)
Cable with BNC plugs at each end:	Through Connector £1.80 -VAT (€2.12)
5m length £8.50 -VAT (€9.88)	Cable plug £1.75 -VAT (€2.02)
10m length £14.00 -VAT (€16.40)	Terminator £2.00 -VAT (€2.36)
20m length £20.00 -VAT (€23.20)	

Please note that all products have 12 months warranty (not on-site maintenance) and that product packaging is shown for illustration purposes only.

SOUND CARDS

CREATIVE
CREATIVE LABS

SoundBlaster 32 card (IDE CD-ROM interface) **£89+VAT** (£104.58)
SoundBlaster AWE64 card..... **£139+VAT** (£163.33)

ZY-FI[®] SPEAKERS

ZY-FI COMPACT **£12+VAT** (£14.10)

The discrete and economical way to give your PC great sound.

- Built-in Stereo Power Amplifier
- 16 Watts PMPO (4 Watts RMS)
- Active or Passive use (active use requires batteries or optional mains adaptor)
- 3" Full Range Cone
- Magnetically shielded
- Volume Control
- Bass Booster
- Treble Booster

ZY-FI



ZY-FI 2 **£29+VAT** (£34.08)

"ZY-FI2s are definitely a sound investment." PC Answers "Recommended" March 1995
"Built-in Stereo Power Amp
• 64 Watts PMPO (12 Watts RMS)

- Magnetically shielded
- Volume Control
- Tone control
- Styling as Zy-Fi2 Pro (below)

ZY-FI 2 PRO **£49+VAT** (£57.58)

"These are the boys to add a bit of oomph to your PC." PC Answers "Recommended" March 1995

Rating 9/10. "Excellent value for money." PC Zone April 1995

Rating 9/10. "A lot of sound for the money" PC Plus April 1996

Rating 4/6. "sound quality on a different level from the other speakers" PC Guide "Best Buy" September 1996

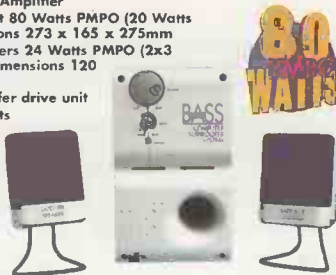
- Built-in Stereo Power Amplifier
- 120 Watts PMPO (36 Watts RMS)
- Magnetically Shielded
- Size 14x23x15cm
- Volume Control
- Bass control
- Treble control



ZY-FI BASS **£75+VAT** (£88.13)

Subwoofer system with satellite speakers. Experience thumping bass and chirpy treble from your PC sound card with Zy-Fi[®] Bass.

- Built-in Power Amplifier
- Subwoofer unit 80 Watts PMPO (20 Watts RMS). Dimensions 273 x 165 x 275mm
- Satellite speakers 24 Watts PMPO (2x3 Watts RMS). Dimensions 120 x 96 x 98mm
- 5.25" subwoofer drive unit
- 3" satellite units
- Magnetically shielded
- Individual volume and bass controls
- External mains PSU



TWO GREAT MULTIMEDIA BUNDLES

OFFERED WITH A VARIETY OF PACKS

Microsoft



- ♦ Works 4
- ♦ Encarta 97 (International Edition)
- ♦ Money 97
- ♦ Fine Artist
- ♦ Explorapedia
- ♦ Dinosaurs
- ♦ Golf 3
- ♦ Scenes
- ♦ Fury 3 (trial version)
- ♦ Windows Entertainment Pack

♦ Media '96 is still available for Windows 3.1 users (Works 3, Encarta 96, Money & Golf - otherwise as above)



SPEAKER UPGRADES

Upgrade the ZyFi2 speakers in any of the following packs for a modest surcharge:
ZyFi2 PROs.....£20+VAT (£23.50)
Multimedia Labs TC1500.....£40+VAT (£47.00)

Lotus ^{MULTIMEDIA} Office 96

Lotus SmartSuite:
1-2-3, Word Pro, Approach
Freelance Graphics, Organizer
Productivity Software:
Quicken 4, CoreIDRAW! 4
Edutainment Software:
Software Toolworks Grolier
Encyclopaedia for 1996,
ITN European Video Atlas
Top Games Titles:
Command & Conquer,
Simon the Sorcerer II,
Screamer



See the CD-ROM drives (below) for details of the complete packs. When ordering please quote pack number. We recommend a minimum 486sx33 system with MS DOS 6.x or Windows95 for these packs. Please note that bundled versions of software and sound cards are not full retail packs, and the software features on-line documentation. Lotus provide 30 days telephone support for their own software. Occasionally we may supply vouchers for software titles which need to be redeemed with manufactures.

Panasonic CD-ROM DRIVES & PACKS

- Panasonic eight and twelve speed drives
- Enhanced IDE ATAPI interface
- Output from audio CDs via headphone socket

- Plug and Play compliant
- MPC and White Book (CDi) compatible
- Multi-session mechanism - compatible with Kodak Photo CD



PANASONIC CR-583

- Eight speed 1200kb/sec sustained DTR
- Super 150ms access

Drive only £55+VAT (£64.63)
Includes cables and driver software

NB - bare drive requires sound card or motherboard with secondary IDE connector

PANASONIC CR-584

- Twelve speed 1800kb/sec average DTR
- Ultra fast 110ms access

Drive only £69+VAT (£81.08)
Includes cables and driver software

NB - bare drive requires sound card or motherboard with secondary IDE connector

8 Drive and card only:
SOUND GENERATOR

£100+VAT (£117.50)
(pack 8a) with Soundblaster 16 card

£140+VAT (£164.50)
(pack 8c) with Soundblaster 32 card

12 Drive and card only:
SOUND GENERATOR

£114+VAT (£133.95)
(pack 12a) with Soundblaster 16 card

£154+VAT (£180.95)
(pack 12b) with Soundblaster 32 card

With Zy-Fi² speakers and **Microsoft**

£165+VAT (£193.88)
(pack 11a) with Soundblaster 16 card

£205+VAT (£240.88)
(pack 11b) with Soundblaster 32 card

With Zy-Fi² speakers and **Lotus** ^{MULTIMEDIA} Office 96

£195+VAT (£229.13)
(pack 10a) with Soundblaster 16 card

£235+VAT (£276.13)
(pack 10b) with Soundblaster 32 card

With Zy-Fi² speakers and **Microsoft**

£179+VAT (£210.33)
(pack 13a) with Soundblaster 16 card

£219+VAT (£257.33)
(pack 13b) with Soundblaster 32 card

With Zy-Fi² speakers and **Lotus** ^{MULTIMEDIA} Office 96

£209+VAT (£245.58)
(pack 14a) with Soundblaster 16 card

£249+VAT (£292.58)
(pack 14b) with Soundblaster 32 card

Multimedia Labs speaker systems

Multimedia Labs **TC1680** High End, Thin Line, Tri-Amp with SP7002 and SP508 Speakers

PC Amp, with it's advanced three channel amplifier incorporating Spatializer[®] 3-D Audio Technology, 2 way satellite speakers and an earth shaking subwoofer, is the first and last multimedia sound system you need ever purchase!

- High powered amplifier producing 22 watts RMS plus 40 watts RMS for subwoofer, crossover at 150Hz.
- Five band active equaliser ranging

- from 20Hz-20kHz.
- Exclusive VRST[™] built-in FET microphone.
- External mic. mixing with variable blend control.
- Line level input/output jacks, plus front mounted professional 1/4" (6mm) headphone and mic. jacks.
- Slim-line chassis designed for placement under monitor.

only £179+VAT
(£210.33)

(Monitor not included!)



BULK PURCHASE SPECIAL OFFER Quality Hi-Fi audio system at a price which can never be repeated!

▶ **TC 1500** Compact Hi-Fi Stereo 75 Watt Amplifier System

only £59+VAT (£69.33)

- Unique palm size remote IR control.
- Two way speaker system with side firing 4" woofers and front firing high frequency piezo tweeters.
- Separate bass & treble controls, variable mic. gain control, and stereo-mono switch for public address applications.
- Micro size amplifier 1 1/2"W x 7"H x 6"D.
- Amplifier power: 12 Watts RMS per channel at less than 1% THD (1KHz).
- 75 Watts maximum power rating both channels driven.

UPGRADE your existing speaker system with the **Killer Sub ▶ SP7001**

- 95 Watts RMS mono power with built-in electronic crossover.
- Free standing, speaker cabinet made of natural wood material for perfection in bass response. Cabinet is 6 1/4"W x 12"H x 10"D. May be mounted vertically or horizontally on the floor.

SPECIAL OFFER! TC1500 & SP7001 £109+VAT (£128.08)

50 Watt Amplified Bass Reflex Subwoofer

only £68+VAT (£79.90)



Front View Rear View

PCI MOTHERBOARDS



Pentium

TYPE 6 FOR PENTIUM UP TO P120.....£65+VAT (£76.38)
 ● 2xPCI local bus slots ● 1xPCI/ISA bus slot ● 3xISA slots ● ZIF socket ● 256kb Cache ● On-board PCI IDE hard disk controller ● 2x 16550 compatible UART driven high speed serial ports ● EPP and ECP compatible parallel port ● Accepts 72-pin SIMMs.
Type 6 board with P120 processor.....£149+VAT (£175.08)
NB - all board + CPU offers include heatsink and fan.

486

TYPE 7 FOR '486 PROCESSORS.....£49+VAT (£57.58)
 ● Will accept most 486 CPUs up to DX4-100 ● 3xPCI local bus slots ● 4xISA slots ● ZIF socket ● P24T upgradeable ● 256kb Cache ● On-board PCI IDE hard disk controller ● 2x 16550 compatible UART driven high speed serial ports ● EPP and ECP compatible parallel port ● Accepts 72-pin SIMMs.
Type 7 board with 486x4+100 processor.....£79+VAT (£92.43)
NB - all board + CPU offers include heatsink and fan.

430VX with 256kb Pipeline-Burst cache

TYPE 9 FOR PENTIUM UP TO P166.....£95+VAT (£111.63)
 ● ECS Triton board with Intel 430VX PCiset ● 4xPCI local bus slots ● 3xISA slots ● ZIF socket ● 256kb Pipeline-Burst Cache ● On-board PCI IDE hard disk controller ● 2x 16550 compatible UART driven high speed serial ports ● EPP and ECP compatible parallel port ● Support for EDO RAM, Pipeline-Burst cache and Native Signal Processing ● Accepts 72-pin SIMMs.
Type 9 board with P120 Pentium processor...£180+VAT (£211.50)
Type 9 board with P133 Pentium processor...£210+VAT (£246.75)
Type 9 board with P166 Pentium processor...£330+VAT (£387.75)
Type 9 board with P166 MMX Pentium...£390+VAT (£458.25)
NB - all board + CPU offers include heatsink and fan.

PROCESSORS

CPU UPGRADES

486DX4-100£35+VAT (£41.13)
 Motherboard support for 3.3V required.
Intel Pentium processors:
 P120.....£85+VAT (£99.88)
 P133.....£115+VAT (£135.13)
 P166.....£235+VAT (£276.13)
 P200.....£385+VAT (£452.38)
 Note: Pentium 133 and above require Socket 7.
 Heatsink and fan recommended for all processors.
 CPU Heatsink.....£3+VAT (£3.53)
 Fan & heat sink for 486.....£10+VAT (£11.75)
 Pentium.....£9+VAT (£10.58)

UPGRADE PCs

UPGRADE YOUR 386/486

Midi-tower case fitted with:
 ◆ Type 6 motherboard (see above)
 ◆ Pentium processor & fan
 ◆ Power supply
 ◆ 8Mb RAM
 ◆ 1Mb video card
P75.....£199+VAT (£233.83)
P120.....£249+VAT (£292.58)



430VX upgrade PC

Midi-tower case fitted with:
 ◆ Type 9 motherboard (see above)
 ◆ Processor & fan
 ◆ Power supply
 ◆ 16Mb RAM
 ◆ 1.2Gb hard disk
 ◆ 1Mb video card
P120.....£399+VAT (£468.83) **P166+.....£419+VAT (£492.33)**

ATX upgrade PC

Midi-tower case fitted with:
 ◆ ATX style motherboard
 ◆ Pentium processor & fan
 ◆ Power supply
 ◆ 16Mb RAM
 ◆ 2Gb hard disk
 ◆ 1Mb video card
 ◆ 8 speed CD-ROM drive
P133...£579+VAT (£680.33) **P166 MMX...£759+VAT (£891.83)**

MONITORS

Due to our bulk purchasing power for our own Vale PCs, we are able to offer the following high specification monitors at very competitive prices.



GoldStar Studioworks monitors

Goldstar Studioworks 15" and 17" models both feature a built-in audio system, plus an ingeniously simple digital push button system which allows complete control over all display adjustments, including pin-cushion, trapezoid and rotation, with on-screen representation of the settings.

- | | |
|----------------------------------|---|
| Studioworks 15 | Studioworks 17 |
| • 0.28mm dot pitch | • 0.26mm dot pitch |
| • 75Hz Flicker-Free at 1024x768 | • 75Hz Flicker-Free at 1280x1024 |
| • 1280x1024 max. res. | • 1600x1280 max. res. |
| • Built-in amplified speakers | • Detachable side panel mounted speakers with 4W rms stereo power amplifier |
| • DDC-2 plug and play compatible | • 3 years on-site maintenance |
| • 3 years on-site maintenance | |

Studioworks 15".....£229+VAT (£269.08)
Studioworks 17" (illustrated).....£479+VAT (£562.83)
Viewsonic 14ES 14".....£180+VAT (£211.50)
 0.28mm dot pitch • 1024x768 max non-interlaced • 800x600 @ 72Hz refresh

iiyama monitors

In the last couple of years iiyama have taken the monitor world by storm, winning over 20 UK magazine awards for technical excellence, display quality and value for money. Many times "Editor's Choice", they are firmly established as the choice of the professional user too.



The Evesham difference

All our iiyama prices include 3 years on-site maintenance, normally £££ extra.

- iiyama Vision Master 17.....£479+VAT (£562.83)**
 0.26mm dot pitch • Up to 86KHz horiz. scan • 1280x1024 @ 80Hz refresh • 1600x1200 max • PC Magazine "Editor's Choice" April 1995
- iiyama Vision Master 17ES.....£509+VAT (£598.08)**
 As above with built-in stereo speakers and Spatializer 3D sound processor
- iiyama Vision Master PRO 17.....£519+VAT (£608.63)**
 0.25mm dot pitch DiamondTron tube • Up to 92KHz horiz. scan • 1600x1200 max resolution @ 72Hz flicker-free refresh
- iiyama Vision Master 21.....£935+VAT (£1098.83)**
 0.27mm dot pitch • Up to 94KHz horiz. scan • 1600x1200 max resolution @ 75Hz refresh
- iiyama Vision Master PRO 21.....£965+VAT (£1133.88)**
 0.30mm dot pitch DiamondTron tube • Up to 94KHz horiz. scan • 1600x1200 max resolution @ 75Hz refresh

Please note that industry standard practice is to quote a monitor's CRT size - the actual viewing area is approximately 1" less.

MEMORY SIMMS

- | | |
|----------------------------------|--|
| 1Mb 30-pin.....£15+VAT (£17.63) | 8Mb EDO.....£36+VAT (£42.30) |
| 4Mb 30-pin.....£25+VAT (£29.38) | 16Mb EDO.....£65+VAT (£76.38) |
| 4Mb 72-pin.....£19+VAT (£22.33) | Level 2 Pipeline-Burst cache: |
| 8Mb 72-pin.....£35+VAT (£41.13) | 256kb module.....£20+VAT (£23.50) |
| 16Mb 72-pin.....£70+VAT (£82.25) | 512kb module (suits Intel Endeavour and Atlantis boards only).....£35+VAT (£41.13) |



MATROX VIDEO CARDS

February 1997 Matrox Mystique

Matrox Mystique 2Mb synchronous graphics RAM (PCI Bus).....£75+VAT (£88.13)
Upgrade to 4Mb (Mystique).....£65+VAT (£76.38)
Matrox Millennium 2Mb WRAM (PCI Bus).....£109+VAT (£128.08)
Upgrade to 4Mb (Millennium).....£80+VAT (£94.00)

Personal Computer "Best Graphics Card" Matrox Millennium

STORAGE & BACKUP SOLUTIONS

ditto tape drives

Crash insurance for your PC

◆ New format using 2Gb low cost cartridges
 ◆ Easy one-step backup
 ◆ Simple plug & go setup

ditto

2Gb Internal unit.....£85+VAT (£99.88)
2Gb Parallel port unit.....£149+VAT (£175.08)
 Tapes for ditto 2Gb.....3 pack £59+VAT (£69.33)

Ditto Travan drives:

◆ Available as either internal or stand alone unit
 ◆ Stand alone version simply connects to the PC's parallel port, with a through port for printer operation

3.2Gb Internal unit.....£105+VAT (£123.38)
3.2Gb Parallel port unit....£205+VAT (£240.88)
 Tape for ditto 3.2Gb.....£29+VAT (£34.08)

Quoted capacities are with compression software supplied

zip drive

Affordable personal storage solution to organise, move and backup your data. It works just like a hard drive, but the 100Mb cartridges give it unlimited expansion potential. It simply plugs into your parallel port in an instant, with a through port for printer operation.

- 3 DRIVES IN ONE:**
- Expand your hard drive with unlimited capacity 100Mb at a time
 - Backup your hard drive Quickly and easily
 - Take it with you Zip drive and cartridges are portable



- ◆ 29ms seek time
- ◆ Up to 1Mb/sec data transfer
- ◆ Very compact (180mm x 137mm x 38mm)
- ◆ Light weight (approx 450g)
- ◆ Includes one 100Mb cartridge, and Zip tools software to help you organise your data
- ◆ Limited lifetime warranty on Zip cartridges

Inexpensive, reliable, and ready to help you organise everything. Use as many disks as you need. Software helps you keep track of it all. Work stuff. Home stuff. School stuff. Whatever.

ZIP DISK DRIVE.....ONLY £119+VAT (£139.83)
 100Mb Zip cartridge.....£14+VAT (£16.45)
 100Mb Zip cartridge.....6 pack £60+VAT (£70.50)

jaz drive

At last - a 1Gb portable solution.

The ultimate solution for storing, transporting and playing multimedia applications. Or backup your entire hard disk. Or create your own digital photo album. Or transport huge graphics files to printers and service bureaus. Just use as many cartridges as you need.



- ◆ The space you need, the speed you need and the portability you need, at a price you can afford
- ◆ Internal and external versions
- ◆ 1Gb of space on each cartridge
- ◆ 12ms seek time
- ◆ 5.5Mb/sec average sustained data transfer
- ◆ 256kb read/write cache
- ◆ Compact, lightweight
- ◆ Faster than most hard disks
- ◆ Fully compatible with Windows 95, DOS/Windows and Macintosh
- ◆ Requires SCSI Interface card
- ◆ external unit (203mm x 137mm x 38mm, approx 900g)
- ◆ Includes one 1Gb cartridge, and Jaz tools software to help you organise your data

JAZ internal drive.....only £300+VAT (£352.50)
JAZ external drive.....only £365+VAT (£428.88)
 1Gb cartridge.....£89+VAT (£104.58) PCI SCSI Interface card.....£80+VAT (£94.00)

VIDEO CARDS



DIAMOND
MULTIMEDIA

Please note that Diamond products are not supplied in retail packaging.



May 1995 and June 1996 (Stealth 64VideoVRAM)



September 1996 (Stealth 3D 2000)



27 June 1995 - US Edition (Stealth 64VideoVRAM)



September 1996 (Stealth 3D 2000) "A decent graphics card and 3D for this price is a real bargain. Diamond have a real winner on their hands."

The new Stealth 3D 2000 brings outrageously fast graphics acceleration with realistic 3D rendering. It also comes with MPEG video acceleration so you can enjoy full-screen video.

Diamond Stealth 64DRAM 1Mb (PCI BUS)£49+VAT (£57.58)
 Diamond Stealth 3D 2000 2Mb (PCI BUS)£65+VAT (£76.38)
 Diamond Stealth 64VideoVRAM 2Mb (PCI BUS)£150+VAT (£176.25)
 Upgrade to 4Mb for Stealth 64VideoVRAM£120+VAT (£141.00)

Seagate HARD DISKS



Runner up: Seagate hard disks



August 1996
Seagate Medalist

Optional installation kit (5.25" mounting bracket kit plus cables)£10+VAT (£11.75)

Seagate 214Mb IDE£89+VAT (£104.58)
 Seagate Medalist 1.2Gb IDE (ST31276A)£113+VAT (£132.78)
 Seagate Medalist 2.1Gb IDE (ST32132A)£149+VAT (£175.08)
 Seagate Medalist Pro 2.5Gb IDE (ST52520A)£179+VAT (£210.33)
 Medalist Pro - the fastest IDE hard disk we have seen
 Seagate Barracuda 4Gb SCSI (ST34271N)£620+VAT (£728.50)
 IBM 100Mb (SCSI)£49+VAT (£57.58)

MOUSE & KEYBOARDS

MITSUMI

Mitsumi Mouse as used in Vale Prima and Prestige PCs£10+VAT (£11.75)



KEY TRONIC

Keytronic 'Windows 95' Keyboard as used in Vale Platinum PCs£29+VAT (£34.08)
 "one of the best weighted and most comfortable set of keys of any mainstream keyboard and with its well raked rows and full Win95 compatibility, it gets our top vote." PC Plus, January 1997



JOYSTICKS & YOKES

MSC Multi-System - combined steering wheel, handlebars, yoke£69+VAT (£81.08)



It's a bike!

It's a plane!

It's a car!

CH Flightstick£27+VAT (£31.71)
 CH Flightstick Pro£55+VAT (£64.63)
 CH Virtual Pilot£62+VAT (£72.85)
 CH Virtual Pilot Pro£72+VAT (£84.60)
 CH Pro Pedals£75+VAT (£88.13)



FX3000£19+VAT (£22.33)

F-15E series - an authentic replica of the F-15E Strike Eagle flight stick:

F-15E Hawk£25+VAT (£29.38)

F-15E Raptor£39+VAT (£45.83)

F-15E Talon£49+VAT (£57.58)



MODEMS

Vale 33.6 'Windows 95' modem ...£59+VAT (£69.33)

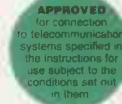
- 33600bps Voice/fax/data modems (PCMCIA version does not support voice functions)
- Low cost internal 'Windows 95' version (Requires Pentium P100 minimum and Windows 95)
- Internet access starter pack: includes full Internet and World Wide Web access software, with first month membership free and 10 hours free on-line time
- Fax software • Cables included



SPECIAL OFFER
All modems include Internet connection software with free trial connection period.

Vale 33.6 internal£75+VAT (£88.13)
 Vale 33.6 external£85+VAT (£99.88)

Vale 33.6 PCMCIA fax/data (not voice)£139+VAT (£163.33)

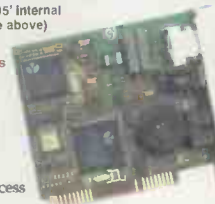


At last A COMPLETE INTERNET SOLUTION!

- Choice of Vale external or 'Windows 95' internal 33600bps voice/fax/data modems (see above)
- 'Supervoice' voice/fax software
- 12 Months UNLIMITED Internet Access via Premier Internet - one of the UK's largest providers
- 100% UK local rate telephone access
- Full e-mail account
- Full technical support
- Cables included

Many packages offer 30 day trial access often with limited access times and leading to high monthly charges. At Evesham Micros we believe in providing a product which is ready to use minutes after you open the box. Join the internet revolution safe in the knowledge that you will have nothing to pay (apart from local rate telephone calls) for 12 months.

'Windows 95' version...£159+VAT (£186.83) External version...£185+VAT (£217.38)



Seagate TAPE DRIVES

Low cost tape backup solutions:

TapeStor Travan storage systems

- 3.2 Gb compressed capacity
- Choice of internal or stand alone external units
- Internal unit uses floppy drive controller
- External unit connects to parallel port
- Tapelt utility software

Tapes...£29+VAT (£34.08)

Internal...£129+VAT (£151.58)

External (illustrated)...£149+VAT (£175.08)



High performance 4/8Gb DAT drive:

- 4Gb uncompressed/8Gb compressed using 120m tape
- Up to 24Mb/min sustained data transfer rate
- Bare internal drive mechanism for 5.25" drive bay
- Requires SCSI-2 host system

DAT drive£549+VAT (£645.08)

120m DAT tape£25+VAT (£29.38)



UPSs

Protect your installation from mains power faults with an uninterruptible power supply.

STATION SERIES UPSs

- Reliable protection from mains surges, spikes, noise and failure
- Interface port and power management software for automatic system shutdown and remote alarm notification by paging/email

Station 280 (280VA)£84+VAT (£96.70)

Station 650 (650VA)£195+VAT (£229.13)

Station 420 (420VA)£129+VAT (£151.58)

Station 1000 (1000VA)£269+VAT (£316.08)

SYSTEM SERIES ON-LINE UPSs

- True on-line protection with voltage and frequency stabilisation under all operating conditions
- Compact design is around 50% smaller than other UPS designs
- PowerSave software and intelligent interface allows comprehensive monitoring and control, plus automated alarm and shutdown routines

System 1000 (1000VA)£599+VAT (£703.83) System 3000 (3000VA)£1349+VAT (£1585.08)



Microsoft



SideWinder 3D Pro joystick

SideWinder 3D Pro gives you unique digital-optical technology and 3D rotation for precise, reliable and responsive game play. Includes 'Hellbender'£45+VAT (£52.88)



IntelliMouse

With the innovative wheel you can zoom and scroll effortlessly in Windows 95, Office 97 and Internet Explorer 3.0 without clicking a button! Works as the best selling Mouse 2.0 in all other applications£49+VAT (£57.58)



Home Mouse

Everyone's ideal mouse. Designed to fit every hand - large or small, left or right - Microsoft Home Mouse makes using your PC easy and fun. With the Home Edition of Intellipoint software£18+VAT (£21.15)

SideWinder Game Pad

There is no other controller like it! More buttons, more control, and an amazingly comfortable design. Plus you can daisy-chain up to 4 Game Pads together for multi-player games, with no extra hardware£29+VAT (£34.08)



Natural Keyboard

Revolutionary design keeps the hands and wrists in a natural position for fast, comfortable typing - try it!£57+VAT (£66.98)

Evesham Micros
Visit your nearest Showroom at
EVESHAM • CAMBRIDGE • BIRMINGHAM • MILTON KEYNES

Scanners from Mustek

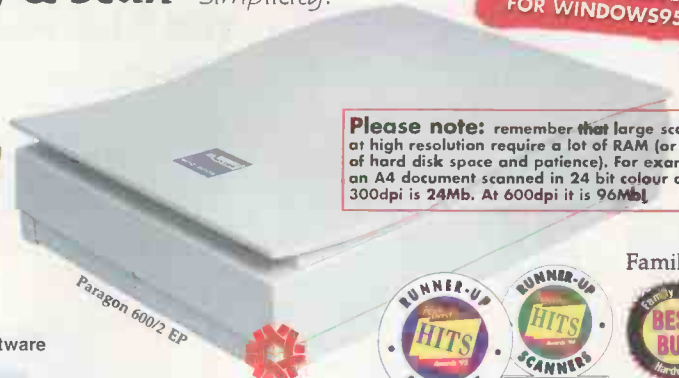
Look out for our new **parallel port** models for 'plug & scan' simplicity.

ALL SCANNERS NOW HAVE TWAIN DRIVERS FOR WINDOWS95

FLATBED A4 COLOUR SCANNERS

- All use *single-pass* scanning – much faster than models which scan each colour separately
- Colour, 8-bit grey and line art modes
- 12 built-in halftoning patterns
- Paragon 600/2 EP is a new 'small footprint' design with compact exterior dimensions, 216mm x 296mm scan area and connects to your parallel port for easy installation
- Other models have 216mm x 356mm scan area and own interface card
- Image scanning and photograph re-touching software, and powerful OCR software

single pass scanning for less than £150



Please note: remember that large scans at high resolution require a lot of RAM (or a lot of hard disk space and patience). For example, an A4 document scanned in 24 bit colour at 300dpi is 24Mb. At 600dpi it is 96Mb!

	Paragon 600/2 EP	Paragon 800 SP	Paragon 1200 SP
OPTICAL RESOLUTION:	300x600dpi	400x800dpi	600x1200dpi
INTERPOLATED RESOLUTION:	4800dpi	6400dpi	9600dpi
COLOUR DEPTH:	24-bit	30-bit	30-bit
FREE SOFTWARE:	ImagePals GO! TextBridge OCR	ImagePals GO! TextBridge OCR	ImagePals GO! TextBridge OCR
	£149+VAT (£175.08)	£219+VAT (£257.33)	£279+VAT (£327.83)
	Transparency adaptor for 800 & 1200...£139 ^{***} (€163.33)	Automatic sheet feeder for 800 & 1200...£199 ^{***} (€233.83)	

SYMBOL OF EXCELLENCE WINNER



"the scanner produced some of the best scans we've seen from a budget flatbed. Offering great value for money, a goodly range of software and easy set-up, the Mustek 600 II SP is a winner."

"The Mustek MFS-1200CX provides a good set of features at the lowest price in the test group...if you need an inexpensive high-resolution scanner, then the Mustek MFS-1200CX should be on your shortlist."

Requirements: Pentium processor, Windows 3.1x/95, Mouse, CD-ROM drive, SVGA graphics or higher, at least 16Mb RAM, and Hard disk with at least 70Mb free

COLOUR HAND SCANNER



Colour 800
PC Direct HITS AWARDS '96
September 1996 Personal Computer World REVIEW
Runner up: Colour hand scanner

£69+VAT (€81.08)

or with 'parallel port' interface £119+VAT (€130.83). Connects directly to parallel port, with through port for printer (not suitable for bi-directional printers).

True **24-bit** colour, **800dpi**

COLOUR SCANNER FEATURES:

- Colour mode gives genuine 16 million colour, 400dpi optical scanning (and up to 800dpi via software interpolation)
- Greyscale mode with true 256 greyscales at up to genuine 800dpi
- Halftone and Line-art modes at up to genuine 800dpi

PACKAGE INCLUDES:

- HAND-HELD COLOUR SCANNER & INTERFACE CARD
- 'iPhoto Plus' top professional Windows based image scanning and photograph re-touching software
- 'Recognita GO-CR' powerful OCR Windows software, giving simple, efficient operation with highly effective results

Requirements: 486sx25 or higher, at least 8Mb RAM, Windows 3.1x, Mouse, Hard disk with at least 35Mb free, and SVGA graphics or higher.

PICTURE THIS! - DIGITAL CAMERA

Superb colour pictures – straight into your PC. No fuss, no films, no developing costs, and no scanner required!

SANYO image PC

£299+VAT (€351.33)
Carry case £19+VAT (€22.33)



- Capture vibrant colour images any time, any place for instant use with your PC or laptop
 - Simple point and shoot operation – fixed focus lens and automatic flash (the flash can be overridden)
 - Store for up to 32 images in memory, then download to your PC with the serial cable supplied
 - Windows® compatible software supplied to view, resize, crop, rotate and adjust colour balance of your images on your PC
 - Use it to build-up your family album, or create flyers, adverts, newsletters, reports, or for property guides or insurance claims
 - 640x480 resolution with 24 bit colour
- System requirements: 486 or higher processor, Windows 3.1 or higher, 3.5" floppy disk drive, hard disk drive with at least 15Mb available, 8Mb RAM or higher, 256 colour VGA display or higher, RS232 serial port



These picture were all taken with the Sanyo Image PC and imported into the advert in minutes!

Before offering a digital camera, Evesham Micros researched the market carefully and found that the Sanyo model offered the best compromise between quality and price. This is consistently supported by many independent reviews.

WHAT VIDEO BEST BUY
June 1996
"Picture quality is excellent. Despite its fixed focus lens, the shots are sharp and certainly up to VGA resolution. The flash is fine up to 20ft. This is, in our view, a brilliant product and an undoubted Best Buy. It's not exactly cheap, but it does its job brilliantly."
Rating: ★★★★★
This review was written assuming a price of £95+VAT

T3
November 1996
"The Sanyo strikes a good compromise between picture quality, image storage and price. It's simple to use, takes pretty good pictures." Rating: 8/10
This review was written assuming a price of £580+VAT

computer arts
Jan/Feb 1997
"This is more like it. It's good looking, compact, solid and well built, and has all the right features to boot. Its own software, Chelsea, is surprisingly good... At this price the Sanyo VPC-G1 offers excellent value for money with an image resolution that matches many of the higher priced offerings"
Rating! ★★★★★
This review was written assuming a price of £399+VAT

A4 COLOUR SHEETFED SCANNER

The simple, effective colour document scanning solution for office and home!

Expand your PC into a multi-purpose office tool – scan documents of all sizes for filing or faxing, or use with a printer for easy copying.

- Genuine 24-bit (16.7 million colour) scanning
- Also 256 greyscale, Halftone and Line-art modes
- Genuine 300dpi resolution, interpolated to 1200dpi
- Connects to parallel port for simple installation
- Document size: 216x356mm max, 51x89mm min
- 10 sheet automatic document feeder
- Very compact "small footprint" design
- Includes "iPhoto Plus" top professional Windows based image scanning and photograph re-touching software, and "Wordlinx" OCR software

ONLY £119+VAT (€139.83)

COLOUR



Requirements: Pentium processor, Windows 3.1x/95, Mouse, CD-ROM drive, SVGA graphics or higher, at least 16Mb RAM, and Hard disk with at least 70Mb free

SOFTWARE OFFERS

special prices with any scanner

Photo Impact 3.0 SE & Wordlinx

for Windows95 – allows text import directly into MS Word
£30+VAT (€35.25)

Software supplied on CD. Includes tutorials and on-line documentation. Requires minimum 486sx-100 and 16Mb RAM.

Photoshop 3.0 LE

Premier image manipulation for Windows 3.1x/95
£40+VAT (€47.00)

SCAN SERVICE TRY BEFORE YOU BUY
Sample disk pack for either the flatbed or colour hand scanners (please state which) containing several images scanned in various modes to provide an exact representation of each scanner's capabilities. A fact sheet is also included containing loading instructions, scanning info., and printed originals. Cost Per Pack **£5+VAT** (€5.88) incl delivery. Refundable on purchase of a scanner.

PRINTERS

HP DeskJet – Laser-sharp type & brilliant colour, at an amazing price...

HP DeskJet 400C

Inkjet Printer

NEW

£127+VAT
(£149.23)

- Compact design with fold away paper tray
- Simple 3 button front panel
- Intuitive on-line help with graphical user interface ■ 600 x 300dpi for precise black ■ Up to 300 x 300dpi colour with snap-in colour cartridge
- Prints up to 16.7 million colours ■ HP's Resolution Enhancement and ColorSmart technology ■ Up to 3ppm fast black printing ■ Prints on plain, glossy or recycled paper, transparencies, envelopes and labels

HP DeskJet 690C

Inkjet Printer

NEW

£209+VAT
(£245.58)

- Up to 600 x 600dpi for precise black
- 600 x 300dpi for superb colour
- Simultaneous use of black and colour cartridges ■ up to 5ppm black, up to 1.7ppm colour (Econofast mode)
- Versatile media handling – prints on plain, glossy or recycled paper, transparencies, envelopes, labels and continuous banners up to 5.5m long ■ HP's RealLife Imaging System plus Photo REt (with optional Photo Cartridge) gives outstanding photo quality images

HP DeskJet 870C

Inkjet Printer

NEW

£335+VAT
(£393.63)

- New professional series printer with premium performance to increase office productivity
- 600dpi high resolution black printing ■ Up to 600 x 300dpi colour printing
- HP's Colour Resolution Enhancement technology for superior quality colour ■ Up to 8ppm black, up to 4ppm colour ■ Print on plain, glossy or recycled paper, transparencies, envelopes and labels
- Comprehensive support for many operating systems including DOS, Windows 3.1/95 and Macintosh ■ 26 scalable fonts plus 125 TrueType fonts for Windows ■ 1000 page per month duty cycle (black)

HP DeskJet 340	£155 ^{***} (£182.13)
Colour kit for 310/320/340/540	£30 ^{***} (£36.25)
HP DeskJet 820 (req Windows 3.1/95)	£240 ^{***} (£282.00)
HP DeskJet 1600	£899 ^{***} (£1066.33)
HP DeskJet 1600CM	£1329 ^{***} (£1581.68)
HP DeskJet long life black ink cartridge	£25 ^{***} (£29.38)
HP DeskJet colour ink cartridge	£25 ^{***} (£29.38)

HP LaserJet 6 P	£499 ^{***} (£586.33)
HP LaserJet 6 MP	£819 ^{***} (£977.33)
HP LaserJet 5	£959 ^{***} (£1126.83)
HP LaserJet 5 N	£1129 ^{***} (£1326.68)
HP OfficeJet LX printer/scanner/fax	£499 ^{***} (£586.33)
HP Support pack 3 year On-Site warranty agreement for DeskJet (mono models)	£55 ^{***} (£64.63) (colour) £65 ^{***} (£76.38)

HEWLETT PACKARD

LaserJet 5L

Simply the best low cost laser printer

- Crisp, clear, permanent HP LaserJet printing
- Impressive 600dpi documents ■ 1Mb standard, expandable to 9Mb ■ 26 True Type scalable fonts built-in; additional 70 scalable fonts on disk
- Fast return to application gets you back to work while your document prints ■ Simplified control panel with 1 operator button and 3 status LEDs
- HP PrintSmart technologies provide simple, complete printing for Windows and/or DOS
- Set up and use in as little as 15 minutes

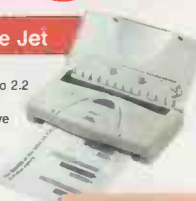
£299+VAT
(£351.33)

HEWLETT PACKARD
Authorised Reseller
Personal Computer Products

Canon

BJ-30 portable Bubble Jet

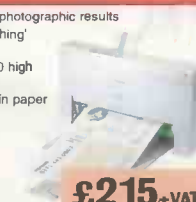
- For mobile printing or light desktop use
- High quality 360 x 360dpi output at up to 2.2 pages/minute
- Added "smoothing function" gives effective 720 x 360dpi resolution
- Prints onto plain paper, envelopes and OHP film
- LCD control panel for ease of use
- 30 sheet built-in feeder
- Windows 3.1 and Windows 95 compatible
- Optional portable kit and worldwide power adaptor



£140+VAT
(£164.50)

BJ-4200 personal colour Bubble Jet

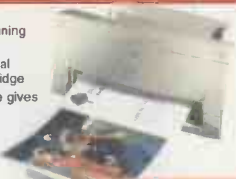
- 720 x 360dpi colour resolution for near photographic results
- 720 x 360dpi mono printing plus 'smoothing' function for crisp text and graphics
- Up to 4.5ppm mono with optional BC-20 high capacity black cartridge
- Wide range of media available from plain paper to high gloss film
- Simple setup and use, with advanced Windows and MS-DOS drivers
- Automatic sheet feeder for up to 100 sheets of paper or 10 envelopes
- 20 scalable TrueType™ fonts plus 6 bitmapped fonts
- Includes BC-21 cartridge with black and colour ink tanks
- 3 year manufacturer's warranty



£215+VAT
(£252.63)

BJC-4550 A3 colour Bubble Jet

- A3 colour and mono output at 720 x 360dpi resolution for stunning presentations
- Up to 4.8ppm mono with optional BC-20 high capacity black cartridge
- Optional BC-22 Photo Cartridge gives unparalleled PhotoRealism™
- Wide range of media available from plain paper to envelopes to high gloss film
- PC and Mac™ compatible
- Automatic sheet feeder for up to 100 sheets of A4 paper or 50 sheets of A3 paper
- Includes BC-21 cartridge with black and colour ink tanks
- 3 year manufacturer's warranty



£305+VAT
(£358.38)

LBP-460 Windows™ Laser

- Incorporates Microsoft® Windows® Printing System for simple setup and use, high print speed and fast return to application
- 600dpi engine with Canon's "Automatic Image Refinement" technology for sharp print quality
- Re-cyclable toner cartridge
- 100 sheet automatic feeder
- Prints onto plain paper, envelopes, labels and OHP film
- Windows 3.1 and Windows 95 compatible
- 1 year on-site warranty



£239+VAT
(£280.83)

Canon BJC-240C	£165 ^{***} (£194.25)	Canon BJC-240C	£165 ^{***} (£194.25)
Canon BJC-240C	£165 ^{***} (£194.25)	Canon BJC-620	£295 ^{***} (£350.75)

CLEARANCE BARGAINS

- Categories: 1. As new, complete
2. Slightly soiled, complete
3. Soiled, incomplete

MONITORS

Viewsonic 14" Category 2	£149 ^{***} (£175.08)
Vale EcoScan 15" Category 2	£159 ^{***} (£186.83)

MONITORS

SPECIAL OFFER – ALL FAX/MODEMS INCLUDE INTERNET ACCESS SOFTWARE WITH FREE TRIAL CONNECTION PERIOD	
Pace 14400 PCMCIA Cat 2	£49 ^{***} (£57.58)
Pace 28800 PCMCIA Cat 2	£99 ^{***} (£116.33)
Pace 28800 Internal Cat 2	£45 ^{***} (£52.88)
Pace 14400 Message Desk Cat 2	£35 ^{***} (£41.13)

IOMEGA BACKUP

250Mb tape drives (internal) Cat 2	£35 ^{***} (£41.13)
2.0Gb tape drives (external) Cat 2	£85 ^{***} (£99.88)
3.2Gb tape drives Cat 2	£109 ^{***} (£128.08)
Zip 100Mb (parallel port) Cat 2	£99 ^{***} (£116.33)

MUSTEK SCANNERS

Greyscale hand scanner Cat 2	£25 ^{***} (£29.38)
600dpi A4 colour scanner Cat 1	£129 ^{***} (£151.58)

A4 sheeted scanner (mono) Cat 2 £69^{***} (£81.08)

PRINTERS

OKI 380 NEW	£149 ^{***} (£175.08)
Various 24 pin Category 2	from £75 ^{***} (£88.13)

INKJET

Canon Category 2	from £120 ^{***} (£141.00)
Olivetti JP-70 Category 2	£99 ^{***} (£116.33)
Olivetti JP-450 Category 2	£145 ^{***} (£170.38)
HP DeskJet Portable Category 2	£75 ^{***} (£88.13)
HP DeskJet 690C Category 2	£179 ^{***} (£210.33)
HP DeskJet 820C Category 2	£199 ^{***} (£233.83)
HP OfficeJet LX NEW	£449 ^{***} (£527.58)

LASER

HP LaserJet 5L Category 2	£249 ^{***} (£292.58)
HP LaserJet 5P Category 2	£450 ^{***} (£528.75)

SPEAKERS (see p12)

Zy-Fi Compact Category 2	£5 ^{***} (£5.88)
Zy-Fi 2 Category 2	£15 ^{***} (£17.63)
Zy-Fi 2 Pro Category 2	£20 ^{***} (£23.50)
Multimedia Labs TC1500 Cat 2	£39 ^{***} (£45.83)

MM Labs SP7001 Subwoofer Cat 2 £40^{***} (£47.00)

OTHERS

Panasonic CR-562 CD-ROM Cat 2	£10 ^{***} (£11.75)
Panasonic CR-581 CD-ROM Cat 2	£25 ^{***} (£29.38)
IBM 100Mb SCSI hard disk Cat 2	£49 ^{***} (£57.58)
Seagate 630Mb IDE (ST3680A) Cat 2	£55 ^{***} (£64.63)
Seagate 1Gb IDE (ST51060A) Cat 2	£85 ^{***} (£99.88)
MSC Multi-System (see p14) Cat 2	£45 ^{***} (£52.88)
Vatious keyboards Category 2	£10 ^{***} (£11.75)
Truemouse NEW	£5 ^{***} (£5.88)
Kingston network cards Cat 2	from £35 ^{***} (£41.13)
SoundBlaster 16 card Category 2	£39 ^{***} (£45.83)
Upsonic UPS 250VA Category 2	£65 ^{***} (£76.38)
Gresham UPS 1200VA Category 2	£199 ^{***} (£233.83)
Zydec PC FM radio Category 2	£19 ^{***} (£22.33)
Creative VideoBlaster NEW	£99 ^{***} (£116.33)
Diamond Stealth videoVRAM NEW	£49 ^{***} (£57.58)

Please contact our Evesham branch for these products. All are clearance lines, shop soiled or second hand stock and all carry 12 months warranty. This stock changes quickly – please call to check availability before ordering. More clearance bargains are held at our other branches – please call them if you do not see what you require.

Evesham Micros



CHECK OUT OUR WEB SITE
<http://www.evesham.com>

HOW TO ORDER....

Call us now on **01386 765500**

TELESALES OPENING TIMES:
9am – 7pm Monday-Friday
9am – 5.30pm Saturday

Mail Order Fax: **01386-765354**

Order by Email: **sales@evesham.co.uk**

Send Cheque, Postal Order or Access/Visa/Switch/AmEx card details to:

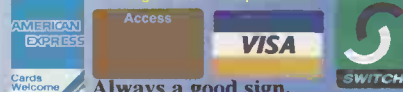
Evesham Micros Ltd., Dept PECW,
Unit 9, St Richards Road,
Evesham, Worcs. WR11 6TD

DELIVERY

Same day despatch whenever possible. All orders are shipped by Insured Courier. The Standard service for orders up to £300 ex VAT value is charged at £5+VAT (£5.88) – normally the second working day after despatch. All orders above this value use the Express service, charged at £10+VAT (£11.75) – normally the next working day after despatch. (UK mainland only, others please call). Please note that 5 banking days must be allowed for cheque clearance. Immediate clearance on Bank Drafts and Building Society cheques.

Account facilities available to qualified commercial customers.

Credit card orders: We do not charge the card until the goods are despatched.



Always a good sign.

Introducing the **EVESHAM MICROS VISA CARD**
see our Web site or call for details

RETAIL SHOWROOMS

Normal Opening times: Monday-Saturday, 9.00-5.30
Late Night Opening Until 7pm Wednesday-Friday

EVESHAM	CAMBRIDGE
Unit 9 St Richards Rd, Evesham Worcs WR11 6TD ☎ 01386-765500 fax: 01386 765354	5 Glisson Road, Cambridge CB1 2HA ☎ 01223-323898 fax: 01223 322883

BIRMINGHAM	MILTON KEYNES
251-255 Moseley Rd, Highgate, Birmingham B12 0EA ☎ 0121-446 5050 fax: 0121 446 5010	320 Witan Gate, Milton Keynes MK9 2HP ☎ 01908-230898 fax: 01908 230865

TECHNICAL SUPPORT
01386-769403 Monday to Friday 10.00 - 5.00
Vale customers please refer to your "Passport to Service".

1 YEAR WARRANTY ON ALL GOODS

All goods subject to availability. Please note that On-site Maintenance applies to UK mainland only. Details correct at time of going to press. Prices and specifications subject to change without notice. E & O E.

THIS ADVERT IS EFFECTIVE FROM 1/3/97
SOME PRICES AND SPECIFICATIONS MAY CHANGE AFTER 31/3/97

Visit your nearest Showroom at **EVESHAM • CAMBRIDGE • BIRMINGHAM • MILTON KEYNES** Media Code: **PECW**

Overall Best Buy
out of 15 x Scanner
group test!
BEST BUY
COMPUTER
SHOPPER
1996
Issue 105

PD ANSWERS
RECOMMENDED

MAC WORLD
October
1996 ISSUE

November
WINNER
1996 issue

PC HOME
9/10
ScanPRO 1200
JAN 96

ScanPRO Awards
PC Advisor
Maximum
6/6 rating

9.40
PC Plus
OVERALL
VICTORY

Windows
Best Buy
April 96 issue

Scanner of the Year
1996 in What PC
Awards June 96

Black Widow®

Colour Flatbed

**NEW LOW PRICES
FROM ONLY!**
£149
EX. VAT



**UNIQUE
3-D
SCAN-HEAD**

The only Scanner
Recommended
In the Best Peripheral
Awards of 1996

RECOMMENDED
PC Advisor
RECOMMENDED
December 1996 Issue
of PC Advisor

PC Guide
March 1997 Issue of
PC Guide

**Computer Buyers
Highest Award!**

**TOP
50
BEST BUY**

**Overall Winner
Comparison Review
against: Umax, Epson,
Mustek, & Trust.**
February 1997 Issue of
Computer Buyer

**Probably the most Award
winning flatbed range in UK!**

"Not only did the Black Widow scanner give the best scans,
but it was the cheapest too". "The UMAX scanner is really
eclipsed, offering little more than the Black widow while
costing significantly more".

COMPUTER BUYER FEB 1997 ISSUE.

OPTIONAL ITEMS AVAILABLE

- Special 32-bit optimised TWAIN driver. **£10**
- X-Rex powerfull image editor. **£20**
- XEROX-TextBridge 96 (full OCR package) **£120**
- ADOBE-PhotoShop V4 (full on CD) **£140**
- ADOBE-PhotoShop LE (on CD) **£40**
- Intellihance- plug-in for PhotoShop **£20**
that automatically enhances scanned pics.
- Transparency KIT for slide & neg scanning. **£120**

* PhotoShop must be bundled with a scanner under no circumstances will it be sold separately. † All prices include v.a.t at 17.5%

**Very Fast - SCSI II device
that will scan a 6 x 4 Colour
Photo in only 4 seconds!**



Actual Scans
...from our 4800 model.
A Picture Speaks a 1000 words!

One of the fastest Photo Scanners In the world.
This advert was produced using our Black Widow 4800 SP
and Corel Draw 6. Why don't all other scanner manufacturers use their scanners?

**2 Year Warranty
FREE!**

NEW 30-BIT MODEL!

OUR BEST SELLER!

A GOOD MID-RANGER!

BEST ENTRY LEVEL DEVICE!

Black Widow® 4830 PRO

MAIN FEATURES:

- 30-bit CCD scan head.
- 400 x 800 optical dpi.
- 4800 x 4800 Interpolated.
- Line art / GreyScale & Halftone / 30-bit colour.
- Gamma correction
- Cold-Cathode C.C.D.
- Full A4 scanning area.
- Unique 3-D scan capability.
- 300dpi photo scan in 20 sec.

FREE WITH ALL SCANNERS:

- Superb Graphics Package.
- XEROX-TextBridge Classic.
- SCSI Card & Cable.
- TWAIN driver for 3.1 & 95.
- Manual & Installation Guide.

INCREDIBLE PRICE! **£269** EX. VAT
£316.08 Inc.vat.

Black Widow® 4800 SP

MAIN FEATURES:

- 24-bit CCD scan head.
- 400 x 800 optical dpi.
- 4800 x 4800 interpolated.
- Line art / GreyScale & Halftone / 24-bit colour.
- Gamma correction
- Cold-Cathode C.C.D.
- Full A4 scanning area.
- Unique 3-D scan capability.
- 300dpi photo scan in 20 sec.

FREE WITH ALL SCANNERS:

- Superb Graphics Package.
- XEROX-TextBridge Classic.
- SCSI Card & Cable.
- TWAIN driver for 3.1 & 95.
- Manual & Installation Guide.

INCREDIBLE PRICE! **£199** EX. VAT
£233.63 Inc.vat.

Black Widow® 2400 SP

MAIN FEATURES:

- 24-bit CCD scan head.
- 300 x 1200 optical dpi.
- 2400 x 2400 interpolated.
- Line art / GreyScale & Halftone / 24-bit colour.
- Gamma correction
- Cold-Cathode C.C.D.
- Full A4 scanning area.
- Unique 3-D scan capability.
- 300dpi photo scan in 30 sec.

FREE WITH ALL SCANNERS:

- Superb Graphics Package.
- XEROX-TextBridge Classic.
- SCSI Card & Cable.
- TWAIN driver for 3.1 & 95.
- Manual & Installation Guide.

INCREDIBLE PRICE! **£179** EX. VAT
£210.33 Inc.vat.

Black Widow® 1200 SP

MAIN FEATURES:

- 24-bit CCD scan head.
- 300 x 600 optical dpi.
- 1200 x 1200 interpolated.
- Line art / GreyScale & Halftone / 24-bit colour.
- Gamma correction
- Cold-Cathode C.C.D.
- Full A4 scanning area.
- Unique 3-D scan capability.
- 300dpi photo scan in 40 sec.

FREE WITH ALL SCANNERS:

- Superb Graphics Package.
- XEROX-TextBridge Classic.
- SCSI Card & Cable.
- TWAIN driver for 3.1 & 95.
- Manual & Installation Guide.

INCREDIBLE PRICE! **£149** EX. VAT
£175.08 Inc.vat.



To order call: 01324 825999 24 Hour Sales: 01324 821000
Payment: Access / Visa / Amex / Delta or Switch Fax: 01324 823663
 Alternatively E-mail your order to the address shown below and for more info & support on all our
 products including detailed specification, News & Reviews just surf across to our new WEB site on:
E-mail devcom@easynet.co.uk **www.blackwidow.co.uk/scanners/**

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 All performance figs will vary depending on system performance. All trade marks are acknowledged. Insured carriage is charged at £10 ex.vat for UK mainland all other areas will be charged at cost.

Black Widow® Scanners Black Widow® Scanners Black Widow® Scanners

Monster! £££

MEMORY BANK

April 1997

SIMM Specials!

4MB
£13

PMM1327 £15.28 inc. VAT

8MB
£22

PMM2327 £25.85 inc. VAT

SIMM shown for illustrative purposes only

Inside:

Software

Memory

Processors

Modems

Networking

Monitors

Storage

Multimedia

Printers

Scanners



Microsoft
Office 97
Standard Edition

Microsoft Office 97
Bookshelf/Intellimouse
bundle, CD ROM
Competitive Upgrade

£249

MSUC000700 £292.58 inc. VAT

See page 38



HP DeskJet 693C

Comes with the HP Home Project Kit - Disney's 101 Dalmations Print Studio (CD), PrintPaks Family Fun Kit and HP Sampler Pack

£215

HPD1693C £252.63 inc. VAT

See page 34

HP SureStore 6020es External SCSI CD Writer

£399

HPSS6020E/CD £468.83 inc. VAT



Make your own CDs!

See page 30 for more details

Technical Sales Order Lines

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Technical
Sales
Order
Lines

0181-
956
7000

(100 lines)

Educational
Sales
Order Lines

0181-
956 7890



Cards are not
debited
until despatch

TERMS AND CONDITIONS OF SALE

All orders are subject to our full terms and conditions of sale which are available on request

Prices and specifications are subject to change and availability

Special offers are valid as long as stocks last

It is the customer's responsibility to check the specification and compatibility of a product before ordering

Pictures are for illustration only

Minimum order value £35 (inc. VAT) plus carriage

Guaranteed next working day delivery applies to most products provided they are in stock and the order is received by 5.00pm that day (subject to credit card authorisation, system failure or courier failure)

All delivery times quoted are estimates only

Lifetime warranty applies only to matched memory. All other types of memory carry a 10 year warranty

All other products carry a manufacturer's warranty (normally 12 months) which may require the customer to deal directly with the manufacturer

Our 14 day money back guarantee applies only to matched memory kits

Customers wishing to return a product must first obtain a Returns Merchandise Authorisation which will be valid for one week after being issued. Products returned without a valid authorisation number will be refused. Products must be returned in original packaging and as new. If a product is returned for replacement, the replacement product will not be despatched until after inspection

Due to copyright law we cannot accept returned opened software unless faulty. Unopened software (shrink wrap intact/seal not broken) can be returned for credit if received by us within 14 days of purchase, subject to the restocking fee

15% restocking fee on non-defective returned goods (£12 inc. VAT minimum)

Carriage is non-refundable

Goods are not supplied on a trial basis

Technical support for certain products is provided directly by the manufacturers

We shall not be liable for any loss whether direct or consequential in connection with any products sold

Prices included in this advertisement are effective from 1.3.97

Errors and omissions accepted

MEMORY Monster! £££

WELCOME TO MEMORY BANK



Mark Simon
Chairman, Powermark plc

Take a look at our prices - we've reduced many prices right across our product range.

Buying from Memory Bank has never been better and you're guaranteed the same first class quality and support.

Mark Simon



QUALITY

ISO9002 (formerly BS5750) registered for the supply of computer, printer and workstation memory, processor and other upgrades.



Certificate no. PS 26595

We are regularly assessed by the British Standards Institution to ensure compliance with the quality standard.

FINANCIAL STABILITY

Memory Bank is the direct division of Powermark plc which has been supplying upgrades for over 6 years and has an annual turnover exceeding £24 million with a healthy balance sheet.

TECHNICAL SUPPORT

Dedicated after-sales technical support teams on-line to help with installation. Direct manufacturers support on some products too!

FULL MANUFACTURERS' WARRANTIES

All products supplied by Memory Bank carry manufacturers' warranties and full Powermark plc guarantees.

CORPORATE AND PUBLIC SECTOR

We welcome orders from corporate, education and public sector organisations.

If you spend more than £50,000 each year on IT then call our Corporate Sales Team on 0181 956 7575.

PERSONAL COLLECTIONS

Call in to collect your goods - but you must place and pay for your order by telephone beforehand. If you want to collect then please allow 15-20 minutes waiting time.



HUGE STOCKS

£1 million stockholding over 9000 different product lines.

Guaranteed next working day delivery on all stock items for orders placed even up to 5.00pm.

TECHNICAL SALES PEOPLE

Our sales people really are the best. They are trained specialists in their chosen field - memory of all types, mass storage, networking, multimedia, communications and high end graphics.



2



**DELIVERY
CHARGES**
See
page 40



Everyone at
Memory Bank
passes through
the Powermark
Academy

The Stationery
Office

Public Sector customers
can purchase through
The Stationery Office
by calling
01603 694153.

Non-defective returned
goods subject to a
restocking fee.
Goods are not supplied
on a trial basis

BANK

Monster! £££

SPECIALS!

Technical Sales Order Lines 

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(100 lines)

WESTERN DIGITAL
1.6GB
£134
IDE HDWD1600 £157.45 inc. VAT
See page 17 for our full range of hard drives

pilot™
The one touch connected organiser



U.S. Robotics Pilot 1000
£159
USRP/1000 £186.83 inc. VAT

Pilot 5000 pictured only **£195**
(£229.13) USR/5000UK

See page 21

Introduction



Certificate no. PS 26535
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GIGABYTE GIVEAWAY!



VISIONEER
PAPERPORT V



New Low Price
Visioneer PaperPort Vx
£189
VISIONEER £222.08 inc. VAT
While stocks last

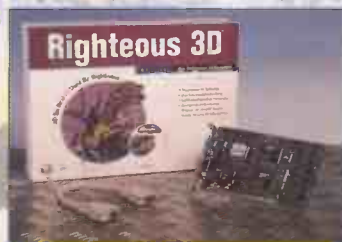
Scans in under 6 seconds!

CD ROM Drives	28-31
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ISDN	23-24
Memory	4-11
Modems	19-22
Monitors	25-26
Multimedia	27-29
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Danmere



Danmere Backer
The fast, low-cost back up solution that uses your VCR!
£34
DANMEREC00100 £39.95 inc. VAT
See page 18 for more details



Righteous 3D
The 3D Graphics Accelerator that gives lifelike animation
£175
ORRIGHT/3D £205.63 Inc. VAT

POWERMARK 16 SPEED CD ROM DRIVE
£97
MBCDROM/16 £113.98 Inc. VAT
See page 28



Bigfoot is here!
See page 16 for more details.

Memory Bank
The Powermark Centre,
The Waterfront,
Elstree Road,
Elstree,
Hertfordshire
WD6 3RP

Educational Sales 0181-956 7890
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VISA

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Cards are not debited until despatch

... and here's what some of our customers have said ...

I want to express my appreciation of the efficiency and helpfulness of your technical and customer sales staff - they are a model for other companies to emulate and I will ensure that all my friends and colleagues turn to your company first for their requirements.

H Harris
Cardiff

I write to congratulate your technical support and sales staff in resolving the problem with a laptop CD Ö.. Your prompt response and helpful attitude is a credit to your organisation and a refreshing change when trading mail order.

I look forward to doing business with you again.

R E Standish
Merseyside

MEMORY Monster! £££

Why upgrade?

As operating systems and applications become more complex, there are higher demands on hardware. You can improve the performance of your system simply by adding more memory.

Adding more memory will result in:

- Major improvements in speed
- Less drain on resources
- Applications opening faster
- Ability to open more applications within Windows
- Less disk caching in Windows - this really slows your system down

As Windows 95 uses both multi-threading and multi-tasking even the applications themselves will run much faster. Under Windows 95 memory management has been vastly improved and this utilises all of the installed memory to provide a more efficient system.

"Adding memory to your computer is undoubtedly the easiest, most cost effective way of increasing the performance of your system"

DON'T JUST TAKE OUR WORD FOR IT...

"...Pentium 75MHz with 16MB of RAM outperforms a P166 with 8MB of RAM"

Personal Computer World, July 1996

"For at least two years we've recommended 8MB machines to our readers. Under Windows 95 this recommendation becomes a must and because Windows 95 is much better at handling extra memory than 3.x you'll get even better performance from 16MB RAM, if you can afford it, get 16MB RAM."

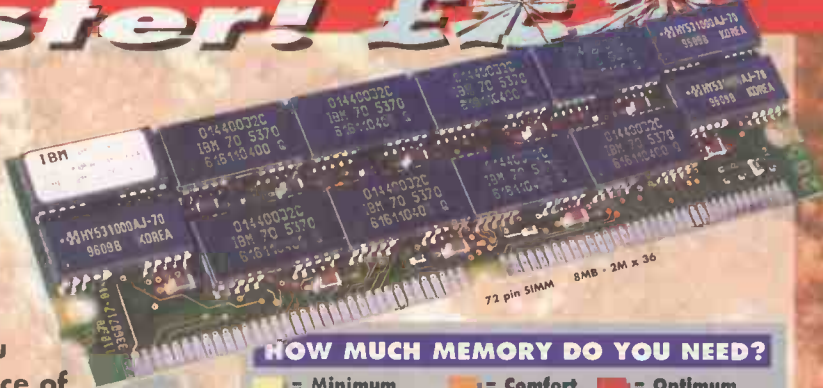
Personal Computer World, September 1995

"...it can be concluded that the best price/ performance ratio in PCs today is obtained by optimising the memory..."

Personal Computer World, July 1996

"Possibly the greatest upgrade you can offer a flagging PC is an increase in memory. The difference in speed between 4MB and 8MB is enormous, as is the jump from 8MB to 16MB. Anyone attempting to run Windows 3.1 in less than 4MB should upgrade now."

Personal Computer World, January 1995



HOW MUCH MEMORY DO YOU NEED?

	Minimum Requirement	Comfort Level	Optimum Performance
Windows 3.1	4	8	16
Windows 95	8	16	32
Windows NT	12	16	32
Windows AS	16	32	48
OS/2 Warp	4	12	20
Apple System 7.5	8	12	16

Numbers indicate Megabytes of memory required

Source: manufacturers' figures

TEXAS INSTRUMENTS

OKI NEC

TOSHIBA PARTNERS

HITACHI GoldStar



BEWARE!

Beware of cheap, low grade, non-factory original modules. These can have two layer boards with long tracks resulting in aerial effects, causing high soft error rates, data corruption and memory protection faults.

Memory Bank only supply grade one, factory original memory as specified and used by major PC manufacturers.

BEWARE!

Beware of economy ASIC parity modules. These inferior modules let systems think they are using parity modules but do not trap and flag soft errors.

Memory Bank only supply modules with genuine parity DRAMS

BEWARE!

Beware of second-hand, pulled memory. Memory Bank supply new, branded and fully certified modules.

BEWARE!

Beware of low voltage, sub standard memory that does not meet the 4.5 to 5.5 volt industry standard. Sub-spec memory runs too slow and can give timing errors that can corrupt data and CMOS configuration information.

BEWARE!

Beware of companies selling modules with 3 and 12 month warranties. Memory Bank provide 10 year guarantees on regular SIMMs and full lifetime guarantees on all Matched Memory Kits.

4



DELIVERY CHARGES
See page 40



Everyone at Memory Bank passes through the Powermark Academy



Public Sector customers can purchase through The Stationery Office by calling 01603 694153.

Non-defective returned goods subject to a restocking fee. Goods are not supplied on a trial basis

Technical Sales Order Lines
0181-9567000
(100 lines)

Educational Sales Order Lines
0181-9567890

VISA



Cards are not debited until despatch



BEWARE!
Beware of third party, low grade memory. Memory Bank only supply factory original memory.

14 day money-back guarantee and limited lifetime warranty on all matched memory



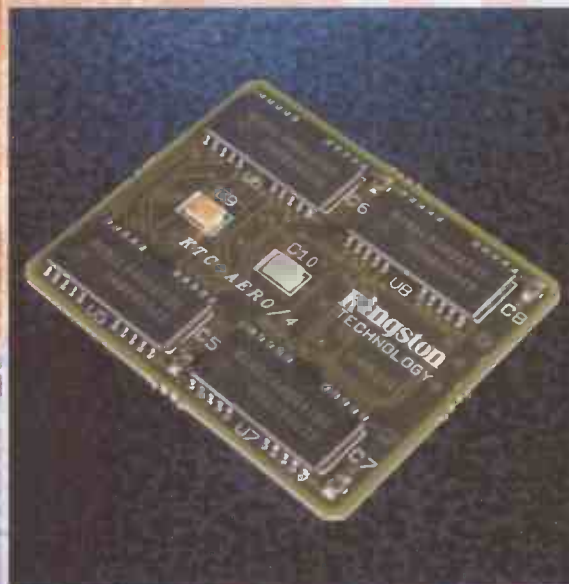
BEWARE!
Beware of economy memory modules that use ASIC parity generation. Memory Bank only supply SIMMs with genuine parity DRAMs.

MEMORY Monster!

MATCHED MEMORY UPGRADES

Matched memory upgrades for ACER

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
ACERNOTE 750, 750C	£88	£103.40			£219	£257.33		
ACERNOTE 730, 760, 780CK	£60	£70.50	£115	£135.13				
ACERNOTE 760i, 760iC, 763, 782, 784	£60	£70.50	£115	£135.13	£225	£264.38		
ACERNOTE PRO 950, 954			£120	£141.00	£230	£270.25	£449	£527.58
ACERNOTE LIGHT 356, 358, 359, 361			£88	£103.40	£165	£193.86	£223	£279.53
ACERMATE 486 SERIES	£39	£45.83	£72	£84.60	£131	£153.93		
ACERPOWER	£39	£45.83	£72	£84.60	£131	£153.93		
ACERPOWER PENTIUM PC			£72	£84.60	£131	£153.93	£241	£283.18
ALTOS PENTIUM			£72	£84.60	£131	£153.93	£241	£283.18
ACROS +4790, 9130, 9133, 9135, 9137	£39	£45.83	£72	£84.60	£131	£153.93	£241	£283.18
ASPIRE DESKTOP & MINITOWER	£39	£45.83	£72	£84.60	£131	£153.93	£241	£283.18
ENTRA : 3094, 3092, 3094, 3126, 3714	£39	£45.83	£72	£84.60	£131	£153.93	£241	£283.18



Matched memory upgrades for ALR

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PROVEISA MULTUS SMP 4/66D	£57	£66.98			£176	£206.80		
PROVEISA VM: 4/33, 4/66D	£57	£66.98			£176	£206.80		
BUSINESS VEISA: 386/33 BOARD	£99	£116.33	£136	£159.80	£203	£238.53	£357	£419.48
BUSINESS VEISA ARRAY 486/50 BOARD	£99	£116.33	£175	£205.63	£245	£287.88	£357	£419.48
REVOLUTION MP: 4/100, P/66, P/100	£39	£45.83	£72	£84.60	£131	£153.93		
EVOLUTION TV ST 4/66D			£72	£84.60	£131	£153.93	£241	£283.18
EVOLUTION SDE: 100, 133, 150, 166			£72	£84.60	£131	£153.93	£241	£283.18

Matched memory upgrades for AMSTRAD

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PC6486	£56	£65.80			£174	£204.45		
PC7386, MEGA PC	£56	£65.80			£174	£204.45		
PC7486C	£56	£65.80			£174	£204.45		
PC9486 30 PIN VERSION	£56	£65.80			£174	£204.45		
PC9486 72 PIN VERSION	£39	£45.83			£131	£153.93		
PC9555i			£58	£68.15	£113	£132.78		
MULTIMEDIA SERIES	£39	£45.83			£131	£153.93		

MAJOR PRICE INSTABILITY!
Call for latest offers on memory before ordering

Matched memory upgrades for APPLE

Complete range stocked - call for details

Matched memory upgrades for APRICOT

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
XEN 486SX-25, 486DX2-50,	£39	£45.83	£72	£84.60	£131	£153.93		
LS550C, LS550 200MHz			£99	£116.33	£189	£222.08	£375	£440.63
V5550, V5660			£58	£68.15	£113	£132.78	£240	£282.00
M5530 MULTIMEDIA			£58	£68.15	£113	£132.78	£240	£282.00
FT EXX 1500					£156	£183.30	£288	£338.40
SHOGUN SERVER					£156	£183.30	£288	£338.40

Matched memory upgrades for AST

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
ADVANTAGE 486SX/20 486/25 486/33	£60	£70.50	£120	£141.00				
ADVANTAGE PRO 486 SERIES	£49	£57.58	£79	£92.83	£115	£135.13	£240	£282.00
ADVANTAGE 614P, 812P, 814P 816P	£49	£57.58	£79	£92.83	£115	£135.13	£240	£282.00
ADVANTAGE 6000 & 8000 SERIES	£49	£57.58	£79	£92.83	£115	£135.13	£240	£282.00
ADVANTAGE EXPLORER	£60	£70.50			£229	£269.08		
BRAVO LC 486 SERIES	£49	£57.58	£39	£45.83	£115	£135.13	£240	£282.00
BRAVO MS, MT PENTIUM SERIES			£79	£92.83	£115	£135.13	£240	£282.00
BRAVO MS-L, MS-T 4/66d			£79	£92.83	£115	£135.13	£240	£282.00
BRAVO MT 4/33, 4/66	£49	£57.58	£79	£92.83	£115	£135.13	£240	£282.00
BRAVO NOTEBOOK	£60	£70.50			£229	£269.08		
PREMMIA 4/33 4/50d 4/66d			£85	£99.88	£169	£198.58	£325	£381.88
PREMMIA GX /P90/P100			£85	£99.88	£169	£198.58	£325	£381.88
PREMMIA SE: 4/33 4/66d P/60			£85	£99.88	£169	£198.58	£325	£381.88
MANHATTEN SMP			£169	£198.58	£325	£381.88		
POWEREXEC 3/25 SL, SLC, EL, 4/33SL	£72	£84.60	£120	£141.00	£230	£270.25		
POWEREXEC 4/25SL COLOUR	£99	£116.33			£258	£303.15		
ASCENTIA 900H, 910H	£88	£103.40	£138	£162.15	£235	£276.13		
ASCENTIA 950H SERIES			£142	£166.85	£263	£309.03		
ASCENTIA J SERIES			£126	£148.05	£226	£277.30	£455	£534.63
ASCENTIA P30 P50			£138	£162.15	£203	£238.53		

Call if your PC is not listed here

Matched memory upgrades for AT&T / NCR

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
SAFARI 3180 3181, GLOBALYST 250 250P	£77	£90.48	£138	£162.15	£258	£303.15	£502	£589.85
3120 NOTEBOOK	£59	£69.33						
GLOBALYST 500, 590, 600			£85	£99.88	£169	£198.58	£325	£381.88

continued...

Don't lose your memory!
See page 36 for details

6



DELIVERY CHARGES
See page 40



Everyone at Memory Bank passes through the Powermark Academy



Public Sector customers can purchase through The Stationery Office by calling 01603 694153.

Non-defective returned goods subject to a restocking fee. Goods are not supplied on a trial basis

BANK

Monster! £££

MATCHED MEMORY UPGRADES

HOW MUCH MEMORY DO YOU NEED?

Minimum Requirement **Comfort Level** **Optimum Performance**

Windows 3.1	4	8	16	Numbers indicate Megabytes of memory required
Windows 95	8	16	32	
Windows NT	12	16	32	
Windows AS	16	32	48	
OS/2 Warp	4	12	20	
Apple System 7.5	8	12	16	

Source: manufacturers' figures

Matched memory upgrades for COMPAQ continued

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
DESKPRO 386/333 486/333 BOARD			£230	£270.25	£350	£411.25	£650	£763.75
DESKPRO 486/25M, 486S/33M BOARD	£159	£186.83	£219	£257.33	£299	£351.33	£599	£703.83
DESKPRO XL: 450, 560, 5100, 5133			£109	£128.08	£175	£205.63	£262	£307.85
DESKPRO XL: 6150 1050/CDS, 6200 2100/PD					£219	£257.33	£405	£475.88
DESKPRO 5/90			£89	£104.58	£155	£182.13	£210	£246.75
DESKPRO MDL: 1200, 2000			£119	£139.83	£179	£210.33	£262	£307.85
DESKPRO: 2000, 4000, 6000			£119	£139.83	£179	£210.33	£262	£307.85
PROLIANT 1500: 5/75 5 /100 5/120			£109	£128.08	£175	£205.63	£262	£307.85
PROLIANT 1500R: 5/75 5 /100 5/120			£109	£128.08	£175	£205.63	£262	£307.85
PROLINEA 575, 590, 5100			£109	£128.08	£175	£205.63	£239	£280.83
PROLINEA MX: 575, 590, 5100, 5120			£109	£128.08	£175	£205.63	£239	£280.83
PROLINEA 4/255, 4/33, 4/50, 4/66,	£39	£45.83	£72	£84.60	£131	£153.93		
PROLINEA 5/75/90MX			£109	£128.08	£175	£205.63	£262	£307.85
PROLINEA 1500: 5/133 5/166			£109	£128.08	£175	£205.63	£262	£307.85
PROLINEA MDL: 1200, 2000			£119	£139.83	£179	£210.33	£249	£292.58
PROSIGNIA 500 SERIES			£109	£128.08	£175	£205.63	£262	£307.85
PROSIGNIA PC SERVERS 486	£39	£45.83	£72	£84.60	£131	£153.93	£245	£287.88
PROSIGNIA VS: 486DX2/66 486/33	£39	£45.83	£72	£84.60	£131	£153.93	£245	£287.88
LTE LITE 20/25/25C/25E	£110	£129.25	£219	£257.33	£315	£370.13		
LTE ELITE SERIES	£99	£116.33	£143	£168.03	£311	£365.43		
LTE 5000, 5100, 5200, 5280, 5300			£122	£143.35	£195	£229.13	£385	£452.38
CONTURA 3/20, 3/25, 3/25C	£70	£82.25	£225	£264.38				
CONTURA 400 C/CX, 4100, 410CX	£78	£91.65	£138	£162.15	£258	£303.15		
CONTURA 425 C/CX	£55	£64.63	£107	£125.73	£199	£233.83		
CONTURA AERO 4/33C, 4/25	£75	£88.13	£109	£128.08	£199	£233.83		
CONCERTO 4/25, 4/33	£75	£88.13	£115	£135.13	£175	£205.63		
PRESARIO CDS 510, 720, 972, 982, 990, 992	£49	£57.58	£109	£128.08	£175	£205.63	£239	£280.83
PRESARIO 425 433 633 650 660	£39	£45.83	£72	£84.60				
PRESARIO 800 SERIES	£39	£45.83	£72	£84.60				
PRESARIO 7212, 7222, 7232, 7234	£119	£139.83	£179	£210.33	£249	£292.58		
PRESARIO 9232, 9234, 9240, 9642	£119	£139.83	£179	£210.33	£249	£292.58		

Lifetime warranty on all matched memory

Matched memory upgrades for DEC

	8MB		16MB		32MB		64MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
2000 ALPHA AXP 300			£156	£183.30			£524	£615.70
3000 ALPHA AXP 600, 700, 800, 900					£421	£494.68	£776	£911.80
3000 ALPHA AXP 300: L, LX, X			£125	£146.88			£469	£551.08
MICROVAX 3100 MODEL 30 & 40	£230	£270.25			£372	£437.10		
DEC-SYSTEM 5000, 5900	£174	£204.45	£225	£264.38	£499	£586.33		
DEC-SYSTEM 5100	£230	£270.25			£372	£437.10		
ALPHASTATION 200/400 SERIES	£79	£92.83	£144	£169.20	£262	£307.85	£469	£551.08
ALPHASTATION 250: 4/266; 255-300			£139	£163.33	£249	£292.58	£479	£562.83
ALPHASERVER 400: 4/166	£79	£92.83	£144	£169.20	£262	£307.85	£469	£551.08
ALPHASERVER 1000: 4/200, 4/233			£257	£301.98	£497	£583.98	£755	£887.13
CELEBRIS 4100, 466, 560, XL590	£79	£92.83	£144	£169.20	£262	£307.85	£467	£548.73
CELEBRIS ALPHA XL: 233, 266	£79	£92.83	£144	£169.20	£262	£307.85	£467	£548.73
CELEBRIS GL: 5100, 5120, 5133, 5166			£135	£158.63	£249	£292.58	£477	£560.48

continued...

Matched memory upgrades for AT&T/NCR continued

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
GLOBALYST 720 730 620 PENTIUMS			£85	£99.88	£169	£198.58	£325	£381.88
GLOBALYST 360 363 TPC, 510 520 530 630	£49	£57.58	£79	£92.83	£115	£135.13	£240	£282.00
MOD 3333, GLOBALYST 550 575: 486s	£49	£57.58	£79	£92.83	£115	£135.13		

Matched memory upgrades for CANON

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
NOTEJET III, INNOVA BOOK IB1100	£66	£77.55	£126	£148.05	£252	£296.10		
NOTEJET 486 SERIES	£60	£70.50	£115	£135.13	£225	£264.38		
INNOVA IB150C 175C	£55	£64.63			£213	£250.28		
INNOVA BOOK 200LS, IB66, IB100	£66	£77.55	£190	£223.25	£230	£270.25		
INNOVA BOOK: 350CD			£120	£141.00	£225	£264.38		
INNOVA BOOK: 360CD, 475CDS/COT			£120	£141.00	£225	£264.38		

QUALITY!

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Matched memory upgrades for COMPAQ

	1MB		2MB		4MB		8MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
DESKPRO 286e, 386/2020e, 386/25/25e	£30	£35.25			£82	£96.35		
DESKPRO 386S	£19	£22.83			£82	£96.35		
PROLINEA 4/255, 4/33, 4/50, 4/66,			£48	£56.40			£72	£84.60
DESKPRO 286N 386N 386S/20M					£93	£109.28		
SLT 286S LAPTOP					£99	£116.33		
SLT 386S/20 LAPTOP					£130	£152.75		
LTE 286 LAPTOP					£119	£139.83		
LTE 386S/20 LAPTOP	£30	£35.25						
	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
ARMADA 1100			£89	£104.58	£165	£193.88		
ARMADA 4100			£93	£109.28	£169	£198.58	£312	£366.60
DESKPRO 486/33, 50, 66 RANGE			£150	£176.25			£515	£605.13
SYSTEMPRO XL 486/50, PENTIUM					£156	£183.30	£288	£338.40

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BEWARE!
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BEWARE!
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MATCHED MEMORY UPGRADES

Matched memory upgrades for DEC continued

	8MB		16MB		32MB		64MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PRIORIS HX, LX	£79	£92.83	£144	£169.20	£262	£307.85	£467	£548.73
PRIORIS ZX SERVER 5133MP			£156	£183.30	£288	£338.40	£524	£615.70
560ST, 566	£79	£92.83	£144	£169.20	£262	£307.85	£467	£548.73
VENTURIS 433sx, 466, 4100, 560, 5100	£64	£75.20	£129	£151.58	£234	£274.95	£462	£542.85
VENTURIS FX: 5100, 5120, 5133, 5166	£79	£92.83	£144	£169.20	£262	£307.85		
HI NOTE: DX2/50, DX4/75	£115	£135.13	£225	£264.38				
HI NOTE ULTRA: SX/33, DX2/50, DX4/75	£135	£158.63	£252	£296.10				
HI NOTE ULTRA II: CTS100, CTS 5100	£135	£158.63	£252	£296.10	£655	£769.63		
HI NOTE VP	£126	£148.05	£240	£282.00				
PC325SL	£120	£141.00	£230	£270.25				
PC425 (PREMIUM): SL/e, SLC/e	£93	£109.28	£258	£303.15				
PC MTE: 433DX, 466D2, 4100			£130	£152.75	£244	£286.70		
STARION PC SERIES	£64	£75.20	£129	£151.58	£234	£274.95	£462	£542.85

Matched memory upgrades for DELL

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
POWERLINE WORKSTATION DE, SE			£95	£111.63	£169	£198.58	£329	£386.58
POWEREDGE XE: 433, 450, 466	£31	£36.43	£65	£76.38	£155	£182.13	£265	£311.38
POWEREDGE EL, SP, XE PENTIUM			£95	£111.63	£169	£198.58	£329	£386.58
LATITUDE NB 433, 433C, 433CX	£65	£76.38			£230	£270.25		
DIMENSION XPS: P90, P100, 133C			£90	£105.75	£159	£186.83	£309	£363.08
DIMENSION XPS 'S' SERIES			£120	£141.00	£199	£233.83	£345	£405.38
DIMENSION 'V' SERIES			£120	£141.00	£199	£233.83	£345	£405.38
OMNIPLEX ME 4100, 433, 450, 466,			£90	£105.75	£159	£186.83	£309	£363.08
OMNIPLEX PENTIUM RANGE			£95	£111.63	£169	£198.58	£329	£386.58
OPTIPLEX: 425, 433, 450, 466	£31	£36.43			£155	£182.13		
OPTIPLEX XL/XM/XMT 5/75, 90 RANGE			£95	£111.63	£169	£198.58	£329	£386.58
OPTIPLEX GL/GM/GMT/GXL/GXM			£90	£105.75	£159	£186.83	£309	£363.08
OPTIPLEX DXG: 590, 5100, 5120, 5133			£95	£111.63	£169	£198.58	£329	£386.58
OPTIPLEX GX <pre>: 6180, 6200</pre>								
LATITUDE LM: P100SD, P133ST			£109	£128.08	£175	£205.63	£349	£410.08
LATITUDE M SERIES	£79	£92.83	£159	£186.83	£279	£327.83		
LATITUDE XP SERIES	£79	£92.83	£159	£186.83	£279	£327.83		
NETPLEX SERIES	£31	£36.43	£65	£76.38	£155	£182.13		
PERFORMANCE L/M/TE: 4/33/50/66	£31	£36.43			£155	£182.13		
PERFORMANCE ME: 433, 450, 466			£95	£111.63	£169	£198.58	£329	£386.58
4000XE: 486/33, 486/50, 486/66			£95	£111.63	£169	£198.58	£329	£386.58

QUALITY!

Being the largest direct supplier means we buy memory direct from world class manufacturers. Memory Bank only supplies factory original memory.

Matched memory upgrades for ELONEX

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PC386 SXM	£56	£65.80	£109	£128.08				
WS RANGE	£39	£45.83	£72	£84.60	£131	£153.93		
PC433M, 450M, 466M	£56	£65.80			£176	£206.80		
486 V/E SERIES			£78	£91.65	£144	£169.20	£262	£307.85
PC-400 SERIES	£39	£45.83	£72	£84.60	£131	£153.93	£231	£271.43
PC-400F, 433E, 450F SERIES					£136	£159.80	£288	£338.40
PC-500 SERIES	£39	£45.83	£72	£84.60	£131	£153.93	£231	£271.43
ELONEX 560F EISA	£39	£45.83	£72	£84.60	£131	£153.93		
PC 575M/L, PC5120M/L, PC5133M/L	£52	£61.10	£108	£126.90	£240	£282.00		



Matched memory upgrades for ESCOM

	8MB		16MB		32MB		64MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
486 DESKTOP RANGE	£54	£63.45	£119	£139.83	£209	£245.58		
486 DX4/100 PCI	£54	£63.45	£119	£139.83	£209	£245.58		
P75/90 PCI MULTIMEDIA	£52	£61.10	£108	£126.90	£240	£282.00	£399	£468.83
P75/90 PCI DESKTOP	£52	£61.10	£108	£126.90	£240	£282.00	£399	£468.83
P100/120/133 PCI TOWER	£52	£61.10	£108	£126.90	£240	£282.00	£399	£468.83
P200 PCI TOWER	£52	£61.10	£108	£126.90	£240	£282.00	£399	£468.83

Lifetime warranty on all matched memory

Matched memory upgrades for GATEWAY

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PC 45X-33	£26	£30.55			£120	£141.00		
PC4: DX-33V, DX-66V	£26	£30.55			£120	£141.00		
PC4: DX2-66P/V	£26	£30.55	£55	£64.63	£120	£141.00	£199	£233.83
PC4: DX2-66P-D-66, D-100	£26	£30.55	£55	£64.63	£120	£141.00		
PS-120/133 ELITE			£62	£72.85	£114	£133.95	£262	£307.85
PC-PS XL: 75, 90, 120, 133			£62	£72.85	£114	£133.95	£262	£307.85
PC-PS: 60, 66, 100, 120, 166			£62	£72.85	£114	£133.95	£262	£307.85
PC-PS: 90, 100 & EXECUTIVE			£62	£72.85	£114	£133.95	£262	£307.85
PC-PS: 100, 130, 133 MULTIMEDIA			£62	£72.85	£114	£133.95	£262	£307.85
PC-PS: 120, 133, 166, 200 MULTIMEDIA	£120	£141.00	£199	£233.83	£345	£405.38		
PC-G6: 180, 180XL, 200XL	£62	£72.85	£114	£133.95	£262	£307.85		

Matched memory upgrades for HEWLETT PACKARD

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
ENTRIA: 14M, 19M, 14C, 15C, 17C	£33	£38.78	£65	£76.38	£98	£115.15	£196	£230.30
ENVIZEX SERIES	£33	£38.78	£65	£76.38	£98	£115.15	£196	£230.30
MULTIMEDIA PC SERIES	£33	£38.78	£65	£76.38	£98	£115.15	£196	£230.30
PAVILIO SERIES	£33	£38.78	£65	£76.38	£98	£115.15	£196	£230.30
VECTRA 386/25 PC, 486 PC, 486S/20	£35	£41.13	£69	£81.08				

continued...

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DELIVERY CHARGES
 See page 40



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MATCHED MEMORY UPGRADES

Matched memory upgrades for HEWLETT PACKARD

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	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
VECTRA VL3 5/75/90/100			£65	£76.38	£82	£96.35	£194	£227.95
VECTRA VE2: 5/75 5/100 5/133			£63	£74.03	£82	£96.35	£194	£227.95
VECTRA VL 4 RANGE			£63	£74.03	£82	£96.35	£194	£227.95
VECTRA XMA 5/75, 100, 120, 133, 150			£63	£74.03	£82	£96.35	£194	£227.95
VECTRA XU 5/75/90/100VE			£65	£76.38	£98	£115.15	£196	£230.30
VECTRA XU 6/150/180/200					£230	£270.25	£399	£468.83
VECTRA VT 6/150/200					£145	£170.38	£269	£316.08
VECTRA 500 RANGE			£42	£49.35	£82	£96.35	£194	£227.95
NETSERVER: LC, LE, LH, LN, LS SERIES	£39	£45.83	£79	£92.83	£131	£153.93	£239	£280.83
OMNI BOOK 530	£72	£84.60	£132	£155.10				
OMNI BOOK 600CT			£132	£155.10	£252	£296.10		
OMNIBOOK 4000 SERIES			£126	£148.05	£225	£264.38		
OMNIBOOK 5000, 5500 SERIES			£138	£162.15	£258	£303.15	£497	£583.98

Call if your PC is not listed here

Matched memory upgrades for HEWLETT PACKARD WORKSTATIONS

	16MB		32MB		64MB		128MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
APOLLO 9000: 7471, 7451	£205	£240.88	£329	£386.58			£1250	£1468.75
APOLLO 9000 712: 60, 80i, 100	£205	£240.88	£329	£386.58	£645	£757.88		
APOLLO 9000: 7431, 7431r	£215	£252.63	£339	£398.33	£655	£769.63		
9000 SERIE 800 BUSINESS SERVER			£380	£446.50			£1200	£1410.00
9000 SERIES: 750, 755, 755/125	£229	£269.08	£329	£386.58	£789	£927.08	£1399	£1643.83
9000 D-CLASS WEB SERVER			£380	£446.50			£1250	£1468.75
3000 SERIES: LX/RX	£205	£240.88			£645	£757.88	£1815	£2132.63
NETSERVER: LXe, LXe PRO SERIES			£259	£304.33	£499	£586.33	£959	£1126.83

Matched memory upgrades for IBM

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PS/2 70, Portable 70/75	£38	£44.65	£72	£84.60				
PS/2 90, 95, 95A	£38	£44.65	£72	£84.60	£131	£153.93		
PS/2 95 ARRAY PENTIUM (ECC)			£120	£141.00	£265	£311.38		
VALUEPOINT 6381, 6382	£38	£44.65	£72	£84.60	£131	£153.93	£240	£282.00
VALUEPOINT 6384 RANGE	£38	£44.65	£72	£84.60	£131	£153.93		
PENTIUM VALUEPOINT PERFORMANCE SERIES	£38	£44.65	£72	£84.60	£131	£153.93	£240	£282.00
THINKPAD 710	£66	£77.55	£126	£148.05				
THINKPAD 760: C, CD, L, LD			£190	£223.25	£470	£552.25	£799	£938.83
THINKPAD 760-E, ED, EL, ELD, X, XD			£181	£212.68	£459	£539.33	£759	£899.83
THINKPAD 350, 350C	£66	£77.55			£246	£289.05		
THINKPAD 355C, 355CS	£76	£89.30	£129	£151.58	£239	£280.83		
THINKPAD 360, 360C, 360CS, 730T	£76	£89.30	£129	£151.58	£239	£280.83		
THINKPAD 500, 510	£105	£123.38	£186	£218.55				
THINKPAD 700, 720	£105	£123.38	£186	£218.55				
THINKPAD 750, 750C, 755C, CDV	£105	£123.38	£186	£218.55	£273	£320.78	£525	£616.88
PC466DX2, 100DX4			£72	£84.60				
PS/1 - PRO 486	£38	£44.65	£72	£84.60				
PS/1 CONSULTANT, ESSENTIAL, WILLOW	£38	£44.65	£72	£84.60				
PS/2 SERVER 95: 9595 INT/ING/DPT	£69	£81.08	£120	£141.00				

continued...

Matched memory upgrades for IBM continued

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PENTIUM APTIVA			£52	£61.10	£108	£126.90	£240	£282.00
PC 300, 500			£42	£49.35	£84	£98.70	£195	£229.13
PENTIUM 300 SERIES			£52	£61.10	£108	£126.90	£240	£282.00
PC 700 SERIES MDL 730-KAA, MDL 750			£62	£72.85	£114	£133.95	£195	£229.13
PC 700 SERIES MDL 730-KAC, MDL 750			£52	£61.10	£108	£126.90	£240	£282.00
AMBRA: ENTERPRISE 486 SERIES	£56	£65.80			£176	£206.80		
RISC SYSTEM 6000: 40P			£119	£139.83			£399	£468.83
XSTATION 160			£119	£139.83			£399	£468.83
PC SERVER 310			£78	£91.65	£144	£169.20	£262	£307.85

Matched memory upgrades for IBM WORKSTATIONS

	16MB		32MB		64MB		128MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
RS/ 6000 POWER-STATION/SERVER	£678	£796.65	£722	£848.35	£1450	£1703.75	£3050	£3583.75
RISC 6000 HD2 32MB MEMORY BOARD					£1999	£2348.83		
RISC SYSTEM 6000: 39M	£678	£796.65	£722	£848.35	£1450	£1703.75	£3050	£3583.75
RS/ 6000 POWER-STATION/SERVER					£759	£891.83	£2580	£3031.50

Matched memory upgrades for ICL

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
WIN STATION P75i			£148	£173.90	£229	£269.08	£400	£470.00
WIN STATION P100, P133, P166, WIN STATION, MULTIMEDIA PENTIUMS			£148	£173.90	£229	£269.08	£400	£470.00
DRS M75			£150	£176.25	£233	£273.78	£415	£487.63
DRS M95			£150	£176.25	£233	£273.78	£415	£487.63
VALUPLUS SD RANGE	£90	£105.75	£150	£176.25	£252	£296.10		
VALUPLUS DL RANGE	£90	£105.75			£252	£296.10		
ZENO AND ERGO PRO 486			£150	£176.25	£252	£296.10	£415	£487.63
ERGO PRO 586			£148	£173.90	£229	£269.08	£400	£470.00

Matched memory upgrades for OLIVETTI

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PCS11, 33	£53	£62.28	£106	£124.55	£156	£183.30		
PCS40, 44	£45	£52.88	£89	£104.58				
M300-28	£45	£52.88	£89	£104.58				
MODULO RANGE	£45	£52.88	£89	£104.58	£145	£170.38		
SUPREMA M6-600, 700			£89	£104.58	£145	£170.38		
PCI/ISA PENTIUMS			£85	£99.88	£139	£163.33		
ECHOS PENTIUM NOTEBOOK			£89	£104.58	£165	£193.88	£355	£417.13

Matched memory upgrades for OPUS

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PRELUDE VLB 1486: SX/33 DX2/66	£39	£45.83	£72	£84.60	£131	£153.93		
PREMIER RANGE VLB: 1486DX2/66	£39	£45.83	£72	£84.60	£131	£153.93		
PROFESSIONAL PCI 1486DX2	£39	£45.83	£72	£84.60	£131	£153.93	£249	£292.58
PROFESSIONAL PCS-90			£59	£69.33	£115	£135.13	£240	£282.00
PROFESSIONAL POWER WINDOWS			£59	£69.33	£115	£135.13	£240	£282.00

Memory

Aaron Answers EDO



Extended Data Out (EDO) SIMMS are the new generation of 72 pin modules. They are non-parity, fast SIMMS that improve the systems performance. They are enhanced further when working with Pipeline Burst cache. EDO modules work by holding the data active on the output of the chip allowing the next read cycle to begin instead of waiting for the old data to clear.

Burst Extended Data Out SIMMS are split into two parts. One part collects the data and the other submits the data to the bus. By splitting the process into two separate parts increases the efficiency of the EDO SIMM and so makes the entire process faster.

Send your questions to Aaron's Answers, c/o Memory Bank, The Powermark Centre, The Waterfront, Elstree Road, Elstree, Hertfordshire WD6 3RP or fax him on 0181 956 7100. You can also Email Aaron on: aaron@powermark.com

Aaron makes every effort to answer your problems, but he cannot guarantee to reply to everyone.

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generation.
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with genuine
parity DRAMs.

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MATCHED MEMORY UPGRADES

Matched memory upgrades for **PACKARD BELL**

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
XL410 SERIES	£57	£66.98	£109	£128.08	£176	£206.80		
LEGEND 435	£39	£45.83	£72	£84.60	£131	£153.93		
LEGEND 605, 900	£39	£45.83	£72	£84.60	£131	£153.93		
486 VLB, EXECUTIVE, ELITE RANGE	£39	£45.83	£72	£84.60	£131	£153.93	£240	£282.00
FORCE RANGE	£57	£66.98			£176	£206.80		
MULTIMEDIA 486/586 RANGE			£52	£61.10	£108	£126.90	£235	£276.13

Matched memory upgrades for **PANASONIC**

	2MB		4MB		8MB		16MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
CF-380 NOTEBOOK	£45	£52.88	£75	£88.13				
CF-500 & CF-V21P 486SX25 (5 VOLTS)			£85	£99.88			£220	£258.50
CF-V21P 486: SX-50, DX2-40 (3 VOLTS)			£95	£111.63	£179	£210.33	£339	£398.33
CF-V41 RANGE			£85	£99.88	£155	£182.13	£259	£304.33
CF-370 NOTEBOOK	£86	£107.05						

Matched memory upgrades for **SILICON GRAPHICS WORKSTATIONS**

	32MB		64MB		128MB		256MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
PERSONAL IRIS: 4D/30, 4D/35	£480	£564.00						
IRIS INDIGO2	£350	£411.25	£590	£693.25	£1150	£1351.25	£2569	£3018.58
CHALLENGE M/3	£350	£411.25	£590	£693.25	£1150	£1351.25		
CHALLENGE L/XL			£890	£1045.75			£3590	£4218.25
POWER CHALLENGE L/XL/DM			£890	£1045.75			£3590	£4218.25
IRIS CRIMSON			£1299	£1526.33				

**Lifetime warranty on
all matched memory**

Matched memory upgrades for **SUN WORKSTATIONS**

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
MOD: 3/60, 3/80, 4/110	£59	£69.33			£199	£233.83		
SPARC 1 4/60, 4/65, 4/75	£59	£69.33			£199	£233.83		
SPARC ELC			£99	£116.33			£279	£327.83
SPARC STATION LX			£99	£116.33			£289	£339.58
SPARC SERVER: 4/330, 4/370, 4/390			£115	£136.13			£395	£464.13
SPARC SERVER: 4, 5			£129	£151.58			£410	£481.75
	32MB		64MB		128MB		256MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
SPARC SERVER 20	£459	£539.33	£849	£997.58				
SPARC SERVER STATION ENGINE 10			£839	£985.83				
SPARC CENTER 2000	£479	£567.83	£959	£1126.83	£1669	£1961.08	£3340	£3924.50
SPARC CENTER 1000	£479	£567.83	£959	£1126.83	£1669	£1961.08	£3340	£3924.50
ULTRA 1	£445	£522.88	£869	£1021.08	£1610	£1891.75		
ULTRASPARC 2 MDL 2200	£445	£522.88	£869	£1021.08	£1610	£1891.75		



Matched memory upgrades for **TEXAS INSTRUMENTS**

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
TRAVELMATE 4000/4000E	£185	£217.38			£770	£904.75		
TRAVELMATE 4000M	£179	£210.33			£686	£806.05		
TRAVELMATE 5000, 5010, 5020, 5100					£135	£158.63	£255	£299.63
TRAVELMATE 5300			£145	£170.38	£268	£316.90		
EXTENSA 450, 455	£60	£70.50	£115	£135.13	£225	£264.38		
EXTENSA 510, 515			£115	£135.13	£213	£250.28	£325	£381.88
EXTENSA 550, 560, 570			£119	£139.83	£245	£287.88	£442	£519.35

Matched memory upgrades for **TOSHIBA**

	4MB		8MB		16MB		32MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
T1000/E/XE/LE, T1800, T1850C, T2000SX, T2200SX	£69	£81.08	£119	£139.83				
T2100, T2100CS	£65	£76.38	£119	£139.83	£199	£233.83		
T2105CS, T2130CS, CL	£65	£76.38	£119	£139.83	£199	£233.83		
T2400CS, T2450, T2400CT, T2150 CDT, T3600	£75	£88.13	£129	£151.58	£209	£245.58		
T3200SX/C	£70	£82.25						
T3400, T3400CT	£65	£76.38	£119	£139.83	£199	£233.83		
T4400, T6400 SX/C, DX/C	£95	£111.63	£170	£199.75	£235	£276.13	£422	£495.85
T1900, T1910, T1950CT, T1960, T3400CT	£79	£92.83	£135	£158.63	£209	£245.58		
T4500, T4600, T4700CT, T4800CT	£79	£92.83	£135	£158.63	£209	£245.58		
T4850CT, T4900CT	£79	£92.83	£135	£158.63	£209	£245.58	£489	£574.58
INFIMA: 7130, 7160, 7200	£149	£175.08	£219	£257.33	£499	£584.33		
PROTEGE 610CT, T2130CS	£146	£171.55	£259	£304.33	£485	£569.88		
PROTEGE 620, 650	£145	£170.38	£249	£292.58				
DYNAPAD T200, T200CS	£79	£92.83	£135	£158.63	£209	£245.58		
SATELLITE PRO 400 SERIES			£146	£171.55	£259	£304.33	£485	£569.88
SATELLITE: 100CS, 105CS			£146	£171.55	£259	£304.33	£485	£569.88
TECRA 500: CDT, CS	£145	£170.38	£249	£292.58	£479	£562.83		
TECRA 700: CS, CT	£150	£176.25	£269	£316.08	£510	£599.25		
TECRA: 710CDT, 720CDT	£146	£171.55	£259	£304.33	£485	£569.88		

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**DELIVERY
CHARGES**
See
page 40



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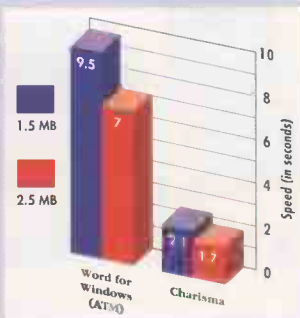
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MATCHED MEMORY UPGRADES

LASER PRINTER MEMORY - AN EXPLANATION

Increasing memory in your laser printer will enable it to print large, graphics intensive documents. Additional benefits include faster print spooling, faster printing speed and multiple font downloading.

This chart shows the improvement a single megabyte of printer memory can make. "Speed" represents the amount of time required to spool the document into the printer and get the full use of your PC back.



How much memory do you need?

Full page graphics	1MB - 2MB	PostScript with duplexing	4MB
Soft fonts	1MB	4 - 5 PostScript fonts	2MB
PostScript cartridge	1.5MB	8 - 10 PostScript fonts	4MB
		Network printer sharing	4MB

MAJOR PRICE INSTABILITY!
Call for latest offers on memory before ordering

Matched memory upgrades for LASER PRINTERS

	1MB		2MB		4MB		8MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
APPLE LASERWRITER SELECT 300/310					£60	£70.50		
APPLE LASERWRITER 4/600PS					£95	£111.63		
APPLE LASERWRITER PRO 810					£99	£116.33	£155	£182.13
APPLE LASERWRITER PRO 600/630					£60	£70.50		
BROTHER HL-660, 1260		£57	£66.98					
BROTHER HL8/E/V HL10			£65	£76.38	£135	£158.63		
CANON NOTEJET 486, BN22/BJC-880					£65	£76.38	£120	£141.00
CANON NOTEJET 486: BN100 BN120					£55	£64.63	£115	£135.13
CANON LBP4, 4+, LITE, SX	£75	£88.13	£107	£125.73				
CANON LBP8II			£85	£99.88	£150	£176.25		
CANON LBP8IV			£63	£74.03	£65	£76.38		
CANON LBP 860, 1260					£60	£70.50		
COMPAG Pagemark 15/20					£90	£105.75	£160	£188.00
EPSON EPL4000/4100/4300/8100	£63	£74.03	£95	£111.63				
EPSON EPL7000	£73	£85.78	£108	£126.90				
EPSON ACTION LASER 1600/1100					£60	£70.50	£115	£135.13
FUJITSU VM4, VM8	£60	£70.50			£120	£141.00		
IBM 4029	£50	£58.75	£70	£82.25	£100	£117.50		
IBM 4039 & 4079					£65	£76.38	£120	£141.00
LEXMARK OPTRA LX/L/R/RX	£50	£58.75	£70	£82.25	£100	£117.50		
LEXMARK WINWRITER 200/400/600	£50	£58.75	£70	£82.25	£100	£117.50		
KYOCERA F800	£76	£89.30	£110	£129.25	£175	£205.63		
KYOCERA F5400, 410, 1500, 1550	£75	£88.13	£150	£176.25	£268	£314.90		
KYOCERA F5650, 1600, 3600			£75	£88.13	£90	£105.75	£130	£152.75
NEC SILENT WRITER 2					£120	£141.00		
OKI LASER 400	£59	£69.33	£97	£113.98				
OKI 800/820					£120	£141.00		
OKI LASER 830/840/850			£76	£89.30				
PANASONIC 4420, 4450i	£67	£78.73	£100	£117.50	£167	£196.23		
PANASONIC 5410, 4440	£50	£58.75	£70	£82.25	£100	£117.50		
TEXAS MACROLASER POWER					£120	£141.00		

Matched memory upgrades for HP PRINTERS

	1MB		2MB		4MB		8MB	
	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT	£ EX VAT	£ INC VAT
LASERJET II, IID	£125	£146.88	£175	£205.63				
LASERJET IIP, III, IIID, IIIP	£99	£116.33	£175	£205.63				
LASERJET 5P, 5MP, 6P, 6MP	£65	£76.38	£117	£137.48	£199	£233.83		
LASERJET 5M, 5M	£65	£76.38	£117	£137.48	£199	£233.83		
LASERJET 5Si, 5SiMx	£65	£76.38	£117	£137.48	£199	£233.83		
HP 5 COLOUR	£65	£76.38	£117	£137.48	£199	£233.83		
HP COPYJET	£65	£76.38	£117	£137.48	£199	£233.83		
LASERJET 4, 4M	£67	£78.73	£119	£139.83				
LASERJET IIiix, 4si, 4Mv, 4MP, 4P	£65	£76.38	£117	£137.48	£199	£233.83		
LASERJET 4Mv, 4V	£65	£76.38	£117	£137.48	£199	£233.83		
DESKJET 1200, 1200C/PS	£67	£78.73	£119	£139.83				
DESKJET 1600C, 1600CM	£65	£76.38	£117	£137.48	£199	£233.83		
DESIGNJET 600, 650C	£65	£76.38	£119	£139.83	£119	£139.83		
PAINTJET XL300	£65	£76.38	£117	£137.48				
HP COLOUR LASERJET	£65	£76.38	£117	£137.48	£199	£233.83		

See page 34 for our range of Hewlett Packard printers

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Memory

Dr Jane Preaches Parity



Parity SIMMs have memory checking capabilities - this double checks and verifies the data in the RAM. Older machines usually demand parity modules but most Pentium systems accept non-parity modules. 30 pin parity modules are known as 'by 9', for example 1M x 9. These are 8 bit modules with an extra bit for parity. Non-parity modules are known as 'by 8', for example 1M x 8.

72 pin parity modules are known as 'by 36', for example 2M x 36 (8MB). These are 32 bit modules with 4 bits for parity. Non-parity modules are known as 'by 32', for example 2M x 32 (8MB).

Your system manual will state whether or not your motherboard takes parity modules. To be sure it is always best to call the Memory Bank technical specialists (0181 956 7000) and they'll provide the correct upgrade path for your system.

Send your thoughts and queries to Dr Jane, c/o Memory Bank, The Powermark Centre, The Waterfront, Elstree Road, Elstree, Hertfordshire WD6 3RP or fax her on 0181 956 7100. You can also Email Doctor Jane on: djane@powermark.com

Dr Jane makes every effort to answer your storage problems, but she cannot guarantee to reply to everyone.

We confess, Dr Jane has no disclaimer - Yet!

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iCOMP® Index 2.0 shows the relative performance of different Intel microprocessors before and after upgrading with the Pentium® OverDrive® processor.



Performance Gain %

Original Pentium® Processor	60MHz	66MHz	75MHz
Pentium OverDrive® Processor Upgrade	120MHz	133MHz	125MHz
Corel Draw	83	83	57
Excel for Windows	74	74	53
Freelance	58	58	42
Lotus 1-2-3	45	43	32
PowerPoint	51	52	41
Word for Windows	49	49	39
WordPerfect	48	47	37

12



DELIVERY CHARGES
 See page 40



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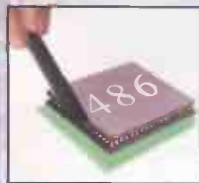
Evergreen 586

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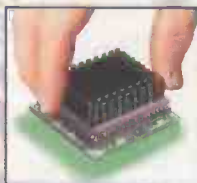
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Locate 486 CPU or OverDrive socket and carefully remove the 486 processor if necessary.



Align pin 1 on the upgrade module with the CPU or OverDrive socket and place the upgrade into the socket.



Firmly press the upgrade (with fingers on heatsink) down into the socket, and you're finished.

PC WEEK Labs, Feb. 12, '96

"Installing the Evergreen upgrade was a simple task taking less than ten minutes to complete."



Winstone 98 Test Results: Windows 95

HP Vectra 486DX/33 MHz	16.7
Upgraded with Evergreen 586/133	31.6
Upgraded with Intel Pentium OverDrive '83	30.9
New Gateway 2000 Pentium 60 MHz	27.9

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...I am pleased to see that there are companies that take positive encouragement for good service by their staff seriously, in a world in which we are all too ready to criticise each other when service is poor.

My reason for contacting you after delivery was after a fortnight trying to obtain the same device from another company. After ringing them about eight times, and being reassured that 'we've probably got one, but if not it'll only be a few days', 'we'll find out when it'll be in and ring you back' (and never did), etc etc, it was a welcome relief to find that your stock list and delivery expectations were correct...

G A Hatcher
Norfolk

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Powermark Plug n Play PCI Fast SCSI II Card

- Designed for Windows 95
- High speed 32-bit PCI bus master DMA transfers up to 133MB/sec in burst mode
- Co-exists with SCSI, IDE or EIDE adapters
- User friendly utility for quick and easy adapter installation and system configuration
- AMD Chipset
- Multitasking & Multi-threaded support
- Disconnect/reconnect tech-nique prevents performance being downgraded during multitasking operations
- Drivers for all major platforms

£99
MBSCL £116.33

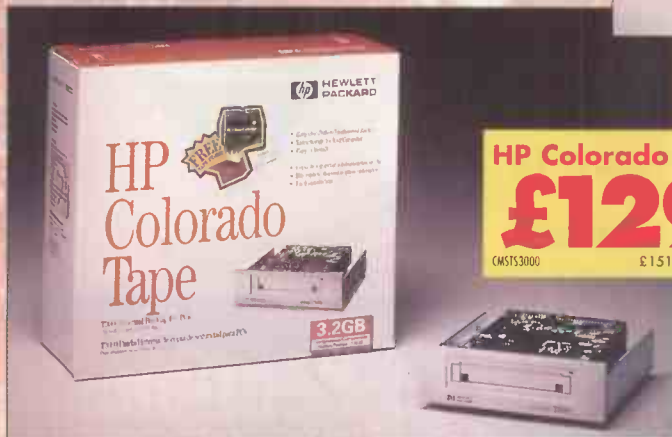
Wide, Ultra and Ultra-Wide versions also available

MEMORY Monster! £££

HP COLORADO STORAGE

COLORADO MEMORY SYSTEMS

A division of **HEWLETT PACKARD**



HP Colorado T3000

The right capacity, the right solution at the right price for value in backup with Continuous daily protection performed automatically

- High capacity 3.2GB (compressed) to insure total data protection for most of today's PCs
- Industry leading reliability and support for complete confidence - Window 95 compatible
- Easy to use, full featured software for powerful and convenient operation - simple connection
- Compatible with Travan™ TR-3, QIC3020 and QIC-WIDE formats
- 2 year, 24 hour express exchange warranty

Cartridge
 DC3020 **£29** (£34.08)

HP Colorado T3000

£129
CMST3000 £151.58 inc. VAT



HP Colorado T4i
£259
HPSST4000 £304.33 inc. VAT

HP Colorado T4i

- NEW NETWORK READY!**
 Affordable data protection for your PC or Server
- 4GB native capacity
 - Network ready backup
 - Includes Novell NetWare and Windows NT drivers
 - 2 year, 24 hour express exchange warranty

HP Colorado T1000e

- Travan technology
- 800MB capacity with compression
- Up to 9.5MB/min back up speed

T1000e Internal
 CMST1000 **£85** (£99.88)

T1000e External
 CMST100E **£109** (£128.08)

Cartridge
 DC800T **£19** (£22.33)

IOMEGA STORAGE

iomega®



IOMEGA ZIP DRIVE
 Affordable personal storage solution to organise, move and backup your data... anywhere

- Increase your storage capacity inexpensively with 100MB removable disks
- High capacity mobile storage - use it of the office, at home, on the road, anywhere
- Excellent and easy for transferring information between two computers

6 pack of cartridges
 IOZIP/C-6 **£55** £64.63

Carry case
 IOZIP/CASE **£24** £28.20

Universal power adapter
 IOZIP/PSU **£29** £34.08

* Price for Credit Card, Switch and cash purchases. Call for credit price.

Iomega Zip Drive
£109*
£128.08 inc. VAT

Parallel - IOZIP/PT SCSI - IOZIP/SCSI Internal - IOZIP/SCSI-I

IOMEGA DITTO 2000

Easy, dependable, full featured backup for you data

iomega Ditto 2000 Internal
 IO2000/1 **£99** £116.33

iomega Ditto 2000 External
 IO2000/E **£129** £151.58

iomega Ditto 3.2GB Internal
 IO2000/3 **£159** £186.83

iomega Ditto 3.2 GB Parallel
 IO2000/P **£199** £233.83

3.2GB cartridge
 DC3020 **£25** £29.38



- New, advanced Travan technology
- 2GB capacity (with compression)
- Proprietary tape technology



iomega Jaz Drive
1GB Internal SCSI
£275
IOJAZ/SCSI-I £323.13 inc. VAT

IOMEGA JAZ DRIVE
 Easy to use mass storage solution

- Provides 1GB of disk space on each compact cartridge
- Store 8 hours of CD-quality sound
- Store 150 colour photographs
- Portable - goes where you go

iomega Jaz Drive 1GB External SCSI
 IOJAZ/SCSI-E **£329** £386.58

1GB cartridge
 IOJAZ/C **£69** £81.08

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DELIVERY CHARGES
 See page 40



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XYRATEX STORAGE

Maximise your PC potential

xyratex

Xyratex MaxIT

MaxIT is unlike any other drive. It is a portable storage unit that can easily deal with endless amounts of data with all the speed and flexibility you need. MaxIT reads and writes to removable 540MB cartridges and also reads Syquest 270MB. Work the way you want to! MaxIT offers you many opportunities for improved performance

**Xyratex MaxIT
External SCSI (DOS & Windows)**

£199

Blue - XYRA/MAX-E £233.83 inc. VAT
Yellow - XYRA/MAX-EY £233.83 inc. VAT

SPEED - 10MB per sec

- Run applications straight from disk
- Instantly access large data files
- Streamline operations and speed up the way you work
- Fast back up - 6.45MB/sec

CAPACITY - 540MB

- Frees your hard drive from having to store large files
- Handle large multimedia presentations
- Work with digital images
- Store multiple hard drives on one disk



Double the capacity of Xyratex Maxit products up to 1GB with Novatech software
£59 £69.33 inc. VAT
Call for details

- Simplify data management: one disk per client, subject or file
- Ideal for backing up important hard disk data

LOW COST

- Cost of around 6 pence per MB

PORTABILITY

- Exchange files with clients and colleagues
- Small footprint - ideal for those with limited space on their desktops - yet portable
- Safe portable data storage

COMPATIBILITY

- Compatible with 270MB Syquest media (read only)
- 540MB MCD media
- Cross platform compatibility

MaxIT Parallel Port

XYRA/MAX-P **£235** £276.13

MaxIT Mac Version

Blue - XYRA/MAX-M **£235** £276.13
Yellow - XYRA/MAX-MY

*MaxIT Internal (DOS & Windows)

XYRA/MAX-I **£149** £175.08

MaxIT Cartridge

Single XYRA/MAX-C **£40** £47.00

3 Pack XYRA/MAX-C3 **£109** £128.08

* Cartridge not included

Every MaxIT includes

- Interface and power cables
- Removable stand
- Software drivers
- Power supply
- Cartridge



MAXTOR STORAGE



Maxtor

**Maxtor DiamondMax
5.1GB
SCSI Performance, EIDE Price**

£319

HD445.1A/DW

£374.83 inc. VAT

Maxtor DiamondMax

The industry's highest capacity and best performance EIDE hard drive

- 3.5" hard drive for multimedia and high performance PCs
- Up to 5.1GB
- Enhanced IDE
- PIO Mode 4 data transfer
- Fast >10ms av. Seek and 5,400rpm spin speed
- MR heads
- 500,000 hr MTBF
- 3 year warranty

HD447.5A/DM **2.5GB £189** (£222.08)

HD444.DA/DM **4.0GB £Call**

HD445.1A/DM **5.1GB £319** (£374.83)

Typical seek time (ms)

Av. Seek >10ms
Access (ms) **5.56**
Rotation (RPM) **5400**
Media Transfer Mbit/s
Inner **64**
Outer **107**
Buffer **256K**

Maxtor CrystalMax

Optimum value. High capacity with reliability.

- Features
- 3.5" hard drive for desktop PCs
 - Up to 3.5GB
 - Enhanced IDE
 - PIO Mode 4 data transfer
 - 12ms av. Seek and 4,480 rpm spin speed
 - High shock resistance
 - 400,000 hr MTBF
 - 3 year warranty

HD441.ZA/CM **1.7GB £145** (£170.38)

HD442.1A/CM **2.1GB £Call**

HD443.5A/CM **3.5GB £219** (£257.33)

Typical seek time (ms)

Av. Seek **12ms**
Access (ms) **6.7**
Rotation (RPM) **4480**
Media Transfer Mbit/s
Inner **41**
Outer **80**
Buffer **128K**

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**Xyratex 3000
640MB Magneto
Optical Drive**

The low cost mass
data back-up
solution!

- 640 MB storage capacity (formatted)
- Read speed of up to 3.07MB/sec
- Write speed of up to 1.02MB/sec
- 10MB transfer rate (synchronous)
- Buffer 480 Kb

XYRA/300E **£369** (£433.58)

**Xyratex X5000
Magneto Optical
Drive**

- 2.607GB at 1024 bytes/sector capacity (unformatted)
- Sustained read speed of 3.37 MB/sec
- Sustained write speed of 1.68 MB/sec
- SCSI bus transfer rate 4MB/sec Max (async)
- Data buffer 1024KB

XYRA/5000 **£1099** (£1291.33)

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280VA	£109
UPS BACKUP280	£128.08 inc. VAT
420VA	£169
UPS BACKUP420	£198.58 inc. VAT
650VA	£219
UPS BACKUP650	£257.33 inc. VAT



SMART UPS WITH POWERCHUTE PLUS SOFTWARE

650VA	£279
UPS SMART650	£327.83 inc. VAT
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UPS SMART1000	£492.33 inc. VAT
1400VA	£599
UPS SMART1400PSW	£703.83 inc. VAT

SMART UPS VALUE SERVER WITH POWERCHUTE SERVER SOFTWARE

650VA	£219
UPS SMART650VA	£257.33 inc. VAT
1000VA	£379
UPS SMART1000VA	£445.33 inc. VAT
1400VA	£499
UPS SMART1400VA	£586.33 inc. VAT

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High Capacity Disk Drives for Consumer-Orientated Personal Computers

Quantum®



BIGFOOT™

- 1.2, 2.1, 2.5, 4.3 & 6.4GB Formatted Capacities
- 5.25-inch, Ultra Slim-Line Form Factor
- Fast ATA-2 PIO Mode 4 & DMA Mode 2
- Lowest Cost/Megabyte IDE Drive Available

Quantum Bigfoot™ IDE hard disk drives use the latest 5.25-inch technology to provide the lowest cost/megabyte available. Because of the large circumference of the platter, less disk accesses are required, and sustained transfer rates are higher than other entry level drives. The Quantum Bigfoot™ is available in 1.2, 2.1, 2.5, 4.3 and 6.4GB capacities. Its ultra slim design, which measures 8 x 5.25 by 0.75 inches, fits into most modular PC cases without modification.

Average access time	up to 12ms
Internal transfer rate	up to 92MB/s
Buffer size	128KB
Rotational speed	3600 RPM
External transfer rate	16.6MB/s

Quantum®



Bigfoot 2.1GB
£137
HD02.11/GB £160.98 inc. VAT

Fireball IDE

Quantum Fireball™ series IDE and SCSI Hard Disk Drives

HD01.21	QM31280TMA	1.2GB IDE	£125	(£146.88)
HD02.16/G	QM32110TMA	2.1GB IDE	£159	(£186.83)
HD02.51	QM32550TMA	2.5GB IDE	£179	(£210.33)
HD03.21	QM33200TMA	3.2GB IDE	£199	(£233.83)
HD03.81	QM33840TMA	3.8GB IDE	£235	(£276.13)

Fireball SCSI

HD01.25	QM31280TMS	1.2GB SCSI	£185	(£217.38)
HD02.15	QM32110TMS	2.1GB SCSI	£229	(£269.08)
HD03.25	QM33200TMS	3.2GB SCSI	£299	(£351.33)

	Fireball™	Atlas™ II
Average access time	up to 10.5ms	up to 8ms
Internal transfer rate	up to 95MB/s	up to 121MB/s
Buffer size	125KB	up to 1024KB
Rotational speed	4500 RPM	7200 RPM
External transfer rate	up to 20MB/s	up to 40MB/s

Atlas II

Quantum Atlas™ II Ultra SCSI Hard Disk Drives provide the ultimate in performance for today's high end systems

HD04.55/AT	QM34550ALS	4.5GB U-SCSI	£699	(£821.33)
HD09.15/AT	QM39100ALS	9.1GB U-SCSI	£1399	(£1643.83)
HD04.55/AT-W	QM34550ALSW	4.5GB UW-SCSI	£699	(£821.33)
HD09.15/AT-W	QM39100ALSW	9.5GB UW-SCSI	£1399	(£1643.83)

AMACOM MASS STORAGE

AMACOM PCMCIA EZCD CARD

EIGHT SPEED CD ROM

- PCMCIA Type II & III
- MPC II and Photo CD
- 1.2MB/s transfer rate
- 150 access time

CDAMA/EZCARD8	£205	£240.88
---------------	------	---------

TWELVE SPEED CD ROM

CDAMA/EZCARD12	£239	£280.83
----------------	------	---------

QUAD SPEED CD ROM

CDAMA/EZCARD4	£169	£198.58
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AMACOM EZ DISK

EXTERNAL 3.5" PARALLEL PORT HARD DRIVE

- Easy connection to parallel port

EZ DISK 850MB

HDAMA/EZ850	£249	£292.58
-------------	------	---------

EZ DISK 1.2GB

HDAMA/EZ1.2	£279	£327.83
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EZ DISK 1.6GB

HDAMA/EZ1.6	£319	£374.83
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EZ DISK 2GB

HDAMA/EZ2.0	£349	£410.08
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Amacom PCMCIA EZCD 12 Speed

£239

CDAMA/EZCARD12 £280.83 inc. VAT

AMACOM PARALLEL EZCD

PARALLEL PORT CD ROM EZCD EIGHT SPEED

CDAMA/EZCD8	£189	£222.08
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EZCD TWELVE SPEED

CDAMA/EZCD12	£229	£269.08
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EZCD QUAD SPEED

CDAMA/EZCD4	£135	£158.63
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Amacom Parallel EZCD Sound

- Portable parallel port CD ROM drive
- Built-in 16-Bit sound card for multimedia capability
- Pass through printer port for concurrent printing
- Built in power supply and cooling fan
- DOS, Windows, Windows 95 and OS/2 compatible

EIGHT SPEED £235

CDAMA/EZCD8S	£276.13 inc. VAT
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TWELVE SPEED £269

CDAMA/EZCD12S	£316.08 inc. VAT
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QUAD SPEED £189

CDAMA/EZCD4S	£222.08 inc. VAT
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AMACOM EZCD PLUS PCMCIA

- Portable PCMCIA based CD ROM & mobile audio CD Player

AMACOM EZCD PLUS 4

CDAMA/EZCDPLUS4	£225	£264.38
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AMACOM EZCD PLUS 6

CD/EZCDPLUS6	£245	£287.88
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AMACOM EZ PARASCSI

CONNECTS ANY SCSI DEVICE TO PC PARALLEL PORT

AMA/EZPARA	£99	£116.33
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AMACOM PSDAT

- Portable parallel and SCSI based external DAT drive

AMACOM PSDAT 4GB

AMA/PSDAT4	£749	£880.08
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AMACOM PSDAT 8GB

AMA/PSDAT8	£949	£1115.08
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AMACOM DISKLITE

External 2.5" parallel port hard drive with FREE carry case

DISKLITE 1.2GB

HDAMA/DL1.2	£359	£421.83
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DISKLITE 1.4GB

HDAMA/DL1.4	£379	£445.33
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DISKLITE 1.8GB

HDAMA/DL1.8	£439	£515.83
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AMACOM PS8000 PORTABLE TAPE DRIVE

- Connects to parallel and SCSI interfaces
- Capacities of up to 8GB
- Backup speeds of up to 60MB/minute via SCSI

PS8000 portable tape drive

AMA/PS8000	£515	£605.13
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See page 40



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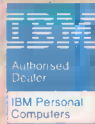
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Seagate

Quantum

WESTERN DIGITAL



Maxtor

FUJITSU

MICROPOLIS

TOSHIBA
PARTNERS

IDE HARD DISK DRIVES

Quantum	HDQ1.2I	1.2GB	12ms	£125	£146.88
Western Digital	AC21200	1.28GB	10ms	£125	£146.88
Western Digital	AC21600	1.62GB	10ms	£134	£157.45
Quantum Sirocco	QM31700SR	1.7GB	12ms	£145	£170.38
Seagate	ST31720A	1.7GB	12ms	£145	£170.38
Seagate Medalist	ST32132A	2.1GB	12ms	£198	£222.08
Western Digital	AC22100	2.1GB	12ms	£179	£210.32
Quantum	Tempest	2.1GB	12ms	£189	£222.08

Seagate	ST52520A	2.5GB	12ms	£179	£210.33
Western Digital	AC32500A	2.5GB	12ms	£189	£222.08
Western Digital	AC33100A	3.1GB	12ms	£242	£284.35
Quantum Fireball	QM33200TM-A	3.1GB	12ms	£199	£233.83
Seagate Medalist	ST33440A	3.4GB	12ms	£259	£304.33
Quantum Fireball	QM33840TM-A	3.8GB	12ms	£235	£276.13
Western Digital	HDCJD4000	4GB	12ms	£299	£351.33
Seagate Medalist	ST34250M	4.3GB	12ms	£359	£421.83

SCSI HARD DISK DRIVES

Seagate Hawk 2XL	ST31055N	1.01 GB	10.5ms	£209	£245.58
Quantum	XP32105S	2.1GB	10ms	£229	£269.08
IBM (AV)	Ultrastar ES	2.1GB	8.5ms	£245	£287.88
Seagate	ST32151N Hawk-2	2.1GB	9ms	£315	£370.13
Seagate Medalist	ST52160N	2.16MB	12ms	£255	£299.63
IBM Capricorn 2ES	46H6127	4GB	8.5ms	£399	£468.83
Fujitsu	M295457	4.3GB	10ms	£599	£703.83
Micropolis	3243FW Fast-Wide	4.3GB	9ms	£795	£934.13
Seagate	ST34371N Barracuda Fast SCSI 2	4.3GB	8ms	£795	£934.13
Micropolis	MIC4345	4.5GB	8.5ms	£675	£793.13

IBM 46H6127	Ultrastar 2XP	4.55GB	7.5ms	£699	£821.33
IBM Ultrastar 2XP	27H714	9GB	8.5ms	£1399	£1643.83
Seagate	ST19171N Elite	9.09GB	8ms	£1345	£1580.38
Micropolis	1991	9.1GB	12ms	£1295	£1521.63
Fujitsu	M29495Y	9.1GB	10ms	£1299	£1526.33

Audio Visual SCSI

Micropolis	3243AV	4.3GB	12ms	£650	£763.76
Micropolis	1991AV	9.1GB	8.5ms	£1445	£1697.88

All IBM SCSI hard disk drives listed are AV compatible

WIDE SCSI HARD DISK DRIVES

IBM 46H135	Ultrastar 2XP	2GB	8.5ms	£285	£334.88
IBM 46H128	Capricorn 2ES	4GB	8.5ms	£399	£468.83
Seagate	ST34371WBarracuda 4LP	4.3GB	9ms	£849	£997.58
IBM 27H772	Ultrastar 2XP	4.55GB	7.5ms	£699	£821.33
IBM (AV) 27H771	Ultrastar 2XP	9.1GB	10ms	£1399	£1643.83
Seagate	ST1917N Barracuda 9	9.1GB	9ms	£1499	£1761.33

ACCESSORIES

EXTERNAL CASES

SDCASE1/3	Single external device case (Half/Full height)	£85	£99.88
SDCASE1/3-FW	Single external fast and wide device case	£129	£151.58
SDCASE2/3	Dual external device case (Half/Full height)	£112	£131.60
SDCASE4/3	Quad external device case (Half/Full height)	£205	£240.88
SDCASE4/5-10	Quad external hot pluggable device case	£1099	£1291.33
SDCASE1/5-H	Single external device case for CD ROMs	£74	£86.95

CABLES CONNECTORS AND CONVERTERS

SCSIC/2	Dual device internal SCSI cable	£8	£9.40
SCSIC/3	3 way internal SCSI cable	£14	£16.45
SCSICBLFW	Fast and Wide internal SCSI cable	£99	£116.33
SCSITERM/A	SCSI active terminator	£27	£31.73
SCSITERM/P	SCSI passive terminator	£12	£14.10
IDECBL	Dual device internal IDE cable	£7	£8.23
CDMK/PAR-MD	Parallel to SCSI converter (Micro D)	£119	£139.83



PCMCIA HARD DISK DRIVES (Type III)

Calluna	Calluna260	260MB	16ms	£329	£386.58
Ministar	PCM/260	130MB		£189	£222.08
		260MB with compression			

2.5" HARD DISK DRIVES

2.5" IDE

Hitachi	DK212A/81	810MB	12ms	£199	£233.83
Hitachi	DK223/10	1.0GB	12ms	£195	£229.13
Toshiba	MK1003MAV	1.0GB	12ms	£249	£292.58
Olivetti	ECHOS	1.3GB	12ms	£375	£440.63
Toshiba	MK1302MAV	1.35GB	12ms	£399	£468.83
Toshiba	MK1702MAN	1.7GB	12ms	£445	£522.88
Toshiba	MK2102MAN	2.1GB	12ms	£449	£527.58

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Digital
1.6GB

£134

IDE HDWD1600 £157.45 inc. VAT

Western
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3.1GB

£242

IDE HDWD3100 £284.35 inc. VAT

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Only £14 (E16.45)
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with any
modem

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DANMERE BACKER

Danmere

The fast, low-cost back up solution

Store up to 1.5GB of data on a standard video tape, with a data transfer rate of 9 megabytes per minute.

Backer can be used with any VCR or Camcorder that has both video in/out connections that can store a composite video signal, including PAL or NTSC video recorders which use VHS, Betamax or Video8 recording formats.

Backer incorporates an 8-bit ISA card that allows you to create templates of files which can then be copied to a VCR tape. With the accompanying software, selecting files requires a simple click of the mouse, and multiple templates can be created and saved to the same tape. Phono sockets are also supplied.



Danmere Backer

£34

DANMERE00100

£39.95 inc. VAT

Back up
your hard
disk with
your VCR!

CHEYENNE SOFTWARE

CHEYENNE

ARCserve 6 FOR NETWORK

ENHANCED RELIABILITY

- RAID 5 fault tolerance - prevents incomplete critical backup
- Real time tape mirroring - duplicate media can be stored remotely
- Full disaster recovery protection
- Intelligent Loader - improved diagnosis of installation errors

IMPROVED PERFORMANCE

- File Interleaving - provides for enhanced speed of backup
- Increased device capacity - offers multiple support

DATA MANAGEMENT

- Centralized Job Management
- Single installation for Multiple ARCserve servers
- SNMP Messaging and Alerts

ARCserve 6 for Workgroups (25 User)

ARCserve6/WG25 **£335** £393.63

ARCserve 6 Enterprise Edition

ARCserve6/ENT **£799** £938.83



ARCserve 6
for Network
£335

CHEYENNE SERVERSUITE 2

- InnoCULAN Server based Anti - Virus on CD
- FAXserve 5 user NIM based fax solution
- ARCserve 25 user NIM backup software

Cheyenne ServerSuite 2
CHEYAPO0200 **£661** £776.68

CHEYENNE INFINITE DISK FOR WINDOWS 95

A revolutionary new way to store files you rarely use, freeing up megabytes of space on your hard disk

Cheyenne Infinite Disk for Windows 95

CHEYENNE-INFINITE **£45** £52.88 inc. VAT

ARCserve 6 FOR NT

- 32-bit multi-threaded architecture
- Backs up and restores all Windows NT file systems including NTFS, HPFS, and FAT
- Compatible with multiple ARCserve environments

ARCserve for Windows NT V6
ARCserve/NT **£309** £363.08

ARCserve for Windows NT Enterprise Edition V6
ARCserve/NT **£559** £656.83

INNOCULAN V4 FOR NT NEW!

- The complete virus protection solution for servers, workstations and PCs
- Includes a host of features distinct to InnoCulan, including free updates via BBS, FTP etc.

InnoCulan V4 for NT
CHEYENNE-INNOCULAN **£639** £750.83



ARCsolo for Windows 95
£75

ARCserve/95 £88.13 inc. VAT



ARCsolo for Windows

ARCserve/95 **£75** £88.13

Cheyenne Backup

The premier backup solution for desktop systems and small networks

CHEYENNE-BACKUP **£39** £45.83

18



DELIVERY
CHARGES
See
page 40

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Adapt your phone to international sockets - works in over 200 countries



The essential modem connection for the travelling computer user wherever that may be. Whether on business or just travelling you need the Laptop Lifeline.

- TeleDaptors(tm) for 220+ destinations
- Suitable for all current UK/USA modems
- Lifetime warranty and 24 hour global support

LAPTOP LIFELINE TELEADAP/LIFE £99 £116.33

MEMORY Monster! £££

TDK MODEMS



The DF2814 Global class PC card is a full featured, ultra high speed, international PCMCIA data fax modem with internal DAA phone line interface.

It's the only fax/modem approved for certified and legal use in 70 different countries. The pull down 'country selector' is easy to use and defaults to the country of origin at power up. The country selector can be upgraded from TDK's bulletin board system as new versions become available.

- 33.6Kbps data, 14.4Kbps fax
- Compact size - internal DAA
- Approved in over 70 countries
- TDK Global support
- 5 year warranty

Every TDK DF2814 includes:

- WinCom Lite
- WinFax Lite
- Protective carry case
- RJ11 and country specific adapter plugs
- Instruction book
- Installation software

33.6Kbps One card - Worldwide use

TDK DF2814 Global Fax/Modem

£149

TDK/PCM28 £175.08 inc. VAT



TDK Network Flyer 100

£149

TDK/PCM100 £175.08 inc. VAT

TDK's newest networking solution, the Network Flyer 100, is an Ethernet LAN adapter card for

both 10BaseT and 100BaseTX connections. This PC Card is ideal for the corporate environment or anywhere 10BaseT/100BaseTX Ethernet LANs are available. The Network Flyer 100 uses CardBus technology, taking the previous PCMCIA 2.X specifications to new performance levels with true 32-bit PCI bus performance in a PC Card format. The Network Flyer 100 operates at 3.3V and is optimised for ultra low power consumption. Included with the LAN adapter card is a manual, LAN drivers and cables and a protective case. 5 Year warranty



TDK Global Networker

- 33,600bps
- 10Mbps Ethernet Card

£239

TDK/PCM28/ET £280.83 inc. VAT

MULTITECH MODEMS

MultiTech Systems



NEW! MTZDX12 Rack Solution £539

MULTI/ZDX12RACK £633.33 inc. VAT

MULTIMODEM II ZDX SERIES

- Now 33.6K
- Group 3/Class 2 (TR29) fax
- V.17 fax compatible
- V42 (lap-M) error correction
- V42bis data compression
- MNP to Level 5
- Asynchronous operation
- AT command set (Hayes compatible)
- Free Multiexpress fax and comms software for windows
- 10 year warranty
- Available in 28.8bps (V34) and 14.4bps (V32bis)



V34 Multimodem II MT2834 ZDX £89

MULTI28Z £104.58 inc. VAT

MULTITECH MODEMS

Model	V32bis	V32turbo	V34	MNP2-4	V42	V42bis	MNP5	Fax	33.6	Internal	inc. VAT	External	inc. VAT
MULTI33.6ZDXK	●	●	●	●	●	●	●	●	●			£135	£158.63
MULTI28Z	●	●	●	●	●	●	●	●	●			£89	£104.58
MULTI28/1	●	●	●	●	●	●	●	●	●	£89	£104.58		
MULTI/PCMCIA34	●	●	●	●	●	●	●	●	●			£139	£163.33
MULTI28	●	●	●	●	●	●	●	●	●			£315	£370.13
MULTI14	●	●	●	●	●	●	●	●	●			£225	£264.38
MULTI28PESI	●	●	●	●	●	●	●	●	●			£399	£468.83

Multimodem II MT2834LTI

£139

MULTI/PCMCIA34 £163.33 inc. VAT

- Desktop unit/metal enclosure
- Group 3/Class 2 (TR29) fax
- PSTN and 2W/4W leased line
- Leased line dial-backup with auto-restoral
- Security call-back (30 no.)
- V42 (lap-M) error correction
- V42bis data compression
- MNP to Level 5
- V2.5bis async/sync
- Free Multiexpress fax and comms software
- 5 year warranty



MULTIMODEM LTI SERIES

- PCMCIA card
- V42bis data compression
- Asynchronous operation
- 5 year warranty

DELIVERY CHARGES See page 40

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U.S. ROBOTICS MODEMS

Be the First with the NEW Sportster Flash 56Kbps ready modem!

Download from the Internet at an amazing 56 Kbps with the Sportster Flash faxmodem. Nearly 100% faster than the 28.8 Kbps speed currently available over ordinary telephone

lines, Sportster Flash users will be able to flash upgrade their modem to x2 of no extra charge, simply

by dialling into the U.S. Robotics bulletin board. With the Flash memory feature you will also be able to flash upgrade your modem as and when new technologies emerge.

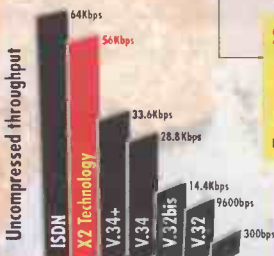
- Internet ready and compatible at 33,600bps
- 1000 mailbox voice mail
- 5 year warranty



Sportster Flash 56Kbps

£199

USRF56 £233.83 inc. VAT



Courier I

- V34/33.6Kbps
- ISDN 2 - 64Kbps
- Asynchronous/Synchronous PPP
- Free lifetime technical support
- 5 year warranty
- x2 upgradeable

£285

£334.88 inc. VAT
External USRC/ISDN Internal USRC/ISDN4



Sportster Voice 33,600 fax modem

£131

USRSP28/VI-ES £153.93 inc. VAT

U.S. Robotics

The Intelligent Choice in Information Access

Sportster Winmodem

£99

USRWIN336 £116.33 inc. VAT

The 33.6 Internal Faxmodem for Windows with Personal Voice Mail

- Internet access compatible at 33,600bps
- Software upgradeable
- 1000 mailbox voice mail
- FREE Internet trials plus everything you need to get on line
- 5 year warranty



FREE with every USR modem

- FREE trials with:
- CompuServe
 - AOL
 - Virgin Net
 - Netcam

U.S. ROBOTICS MODEMS

Lower Prices!

- V32bis
- V32terbo
- V.34
- MNP2-4
- V42
- V42bis
- MNP5
- HST Cellular Fax
- 33,600

Model	Features	Internal Inc. VAT	External Inc. VAT
USRSP14	Sportster 14.4	£76	£89.30
USRSP14/VI-E	Sportster Vi 14.4 + Voice	-	£76
USRSP28-S	Sportster 28,800 V.34 + Fax	£131	£153.93
USRSP28E/MAC	Sportster 28,800 V.34 Mac + Fax	-	£145
USRSP/VI-ES	Sportster Voice 33,600 + Fax	-	£131
USRSP/VI-ES/MAC	Sportster Voice 33,600 Mac + Fax	-	£131
USRCDFV-I	Courier Dual Standard V.34 + Fax	£199	£233.83
USRCDFE	Courier Dual Standard V.34 + Fax	-	£199
USRF56	Sportster Flash 56Kbps	-	£199
USRWIN336	Sportster Winmodem	-	£99
USRJACK/P	Sportster XJACK +Internet	-	£131

5 year warranty on all modems

U.S. ROBOTICS PILOT

'The U.S. Robotics Pilot 5000PDA is a remarkable product, both in terms of its features and its consummate ease of use.'

PC Magazine - January 1997 - Winner of 'Best Peripheral' Award

pilot™

The one touch connected organiser

- Your diary is with you at all times with personal notes and an alarm function for particular events
- Have your PC information at hand. Keep notes using the Graffiti hand recognition software or on-screen keyboard
- Pilot stores thousands of addresses, contact numbers, appointments, and personal notes, yet fits into your shirt pocket and weighs less than 6 ounces
- Pilot comes with everything you need to enter, edit, import, and export information to and from your PC at the touch of a button

'Our word is don't be without one'
Computer Shopper '96

With one touch you can have your PC information at hand - wherever you are. Addresses, diary, memopad, to-do list and calculator all in one compact unit, and small enough to fit into your shirt pocket. Your Pilot and PC are in sync within seconds as information is transferred in either direction, simply by placing the Pilot into its cradle and hitting the 'HotSync' button. Pilot comes with all the necessary desktop and organiser software you'll need - with no hidden or additional extras to get the functionality and connectivity you want.

Compatible with Windows software

US Robotics Pilot 100

USR1000 **£159** £186.83 inc. VAT

U.S. Robotics Pilot 5000PDA

£195

USRP/5000UK £229.13 inc. VAT



Technical Sales Order Lines

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Modems



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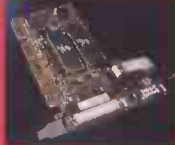
Achieve the full potential of your 28.8 modem with our High Speed Serial Card



If you don't have a 16550 UART IC on your system board, your modem will run at only 50% of its maximum speed!

Our easily installed High Speed Serial Card gives you maximum performance.

MSB SERIAL/2A **£17** (£19.98)



Save £3
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Challenge features:

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+ FAX External
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software (CD ROM)
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- Multiple player
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*evenings and weekends;
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HAAC336/G £170.38 inc. VAT

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POWERMARK VOICE MODEM RANGE



powermark



33,600 Voice Modem
from
£95
MBM00336V/1 £111.63 inc. VAT
External version illustrated

**BABT
approved**

Every Powermark Voice
modem is supplied with:

- 10 year warranty
- Cheyenne BitWare voice,
fax and data software
- Internet trial software
- **Tel Me Life**
Business information manager software

- Full duplex
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auto-answer
- Local/remote voice mail record and playback
- Local/remote fax retrieval
- Unlimited number of messages stored
- Synchronous and asynchronous operation
- External model with headphone and
serial cable

POWERMARK MODEMS

Model	V32bis	V34	MNP2-5	V42	V42bis	Fax	Voice	33,600	Internal	Inc. VAT	External	Inc. VAT
MBM00336V/1	●	●	●	●	●	●	●	●	●	£95	£111.63	
MBM00336V/E	●	●	●	●	●	●	●	●			£99	£116.33

MBSERIAL 2/A - 2 Port High Speed Serial Card £17 £19.98

- Dual 16550 UART serial connection
- Enables shorter communication times and therefore reduces costs
- Save £3 when purchased with any modem

Top quality, fully featured, Internet ready, BABT approved modems brought to you at unbeatable prices from Memory Bank. All modems feature Auto-Dial and Auto-Answer to ensure ease of use. Error correction and data compression provide enhanced reliability and improved throughput of data giving you complete piece of mind whilst saving you money.

HAYES MODEMS

Hayes™

Reliability,
compatibility
and
ease of use



ACCURA 33,600
voice + fax

£127

HAAC336/Y £149.23 inc. VAT

LOW COST DIAL-UP COMMS ACCURA 336 Modems

- Choose between Internal or
External models
- FDX speaker phone (internal only)
- Voice answerphone
- Remote fax & voice message
retrieval
- Fax & fax on demand
- Internet software/30 day access
- CompuServe and AOL trials

HAAC336/Y **£127** £149.23

ADVANCED BUSINESS COMMS OPTIMA Business Modem

- 33.6Kbps external
- Fast compression to 230.4Kbps
- Dial Back security
- UK Caller ID
- Remote configuration
- Flash ROM upgradeable
- Leased line support
- Sync, Async and AutoSync
- Complete answerphone feature set
- Fax on demand

HAOP336/Y **£211** £247.93

HAYES MODEMS

The industry standard

Model	V34	V32bis	GSM V32	V42bis	MNP5	811 V42bis	Fax on	Voice	Security	33,600	ex. VAT	inc. VAT
HAAC14	●	●	●	●	●	●	●	●	●	●	£79	£92.83
HAAC336	●	●	●	●	●	●	●	●	●	●	£115	£135.13
HAAC336/I	●	●	●	●	●	●	●	●	●	●	£115	£135.13
HAAC336/Y	●	●	●	●	●	●	●	●	●	●	£127	£149.23
HAAC336/V	●	●	●	●	●	●	●	●	●	●	£127	£149.23
HAOP336/Y	●	●	●	●	●	●	●	●	●	●	£211	£247.93
HAOP336/P	●	●	●	●	●	●	●	●	●	●	£159	£186.83
HAOSM/P	●	●	●	●	●	●	●	●	●	●	£105	£123.38
HAOSM/AL	●	●	●	●	●	●	●	●	●	●	£105	£123.38
HAAC/ISDN											£199	£233.83
HAOPESP											£55	£104.58

PORTABLE COMMS

OPTIMA 336

- Fax PC Card
- PCMCIA 2.0/2.1 Type II
- New optional GSM kits available
- Power saving feature
- Hot swapable
- Flash ROM upgradeable

HAOP336/P **£163** £191.53

All modems supplied
by Memory Bank are
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ISDN COMMS

ACCURA ISDN

- Multilink PPP 128Kbps
- V.120 / V.110 Rate Adaption
- V.42bis compression
- Throughput to 460.8Kbps
- 2 Analogue Ports
- Flash ROM upgradeable
- Hayes Windows Software
- 30 days free Internet
- Quarterdeck Internet Software

HAAC/ISDN **£199** £233.83

Surf
the
Internet
from only
£79

22



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RACAL

Bring your business partners closer, faster with a comprehensive range of low cost plug and play ISDN solutions from Racal - Datacom



DAP 6300 LITE
External ISDN Adapter

from **£299**
RACDAP6300L from £351.33 inc. VAT

DAP 6300 LITE

Designed for simple plug and play integrated ISDN access, the DAP 6300 LITE provides the link

between ISDN and conventional home and office equipment such as the PC, phone and fax. Both data and analogue traffic can share a single Basic Rate ISDN line, saving 2 analogue PSTN lines, plus great call charge savings with fast data transfer speeds and error correction.

- Calling line identification
- Multiple subscriber numbering
- Data & Analogue model
- Data model
- High Speed V24 port
- Plug and Play

FREE Internet software:

Tel Me Lite and Global Internet software
Internet access - only £7.50 per month for unlimited usage

DAP 6300 PLUS

- 128Kbps
- V42bis compression
- Network management

RACDAP6300+ from **£475** £558.13

DAP 6200 Data only

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New includes Acotec software, voice, data and fax

EXTOL ISDN Communications Centre

- Windows 95, NT, Windows For Workgroups 3.11 (TA only)
- 128Kbps data throughput with Windows 95 and NT
- Plug and Play
- No memory Space
- Half size card for ISA and EISA

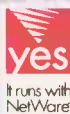


£160 £188.00

GREY CELL NETWORKING

Grey Cell Systems

thinking ahead



Grey Cell 4000
33.6Kbps Fax/Modem.
GSM Upgradeable

£149

GREYMOD4000 £175.08 inc. VAT

Keep in touch with the NEW 4000 Series - the PC card designed to connect to selected GSM mobile phones as well as standard telephone lines (33.6 Kbps). The 4000 series has been created with the future in mind - it's design is based on flash memory and digital signal processing, so that it can be upgraded to cope with new technologies. The 4000 series has also been designed to work with phone lines in over 20 countries - the global communication solution.

4020 - GSM upgrade for Nokia 2100; Nokia 2140; Nokia 2146; Orange 5.1

GREYMOD4020 **£119** (£139.83)

4022-GSM upgrade for Panasonic G400 and G500

GREYMOD4022 **£119** (£139.83)

4040 All in one solution- 33.6Kbps Fax/Modem with GSM support for Nokia 2100; Nokia 2140; Nokia 2146; Orange 5.1

GREYMOD4040 **£299** (£351.33)

4042 All in one solution-33.6 Kbps Fax/Modem with GSM support for Panasonic G400 and G500

GREYMOD4042 **£299** (£351.33)

THE 3400 SERIES

Fax - Modem - Ethernet Adapter
Recent winner in PC Magazine review

- V34 modem (33.6Kbps)
- Simultaneous functionality without loss of speed
- 100% control for both LAN and remote access
- Frees the user from add-on cables and connectors
- DOS, Novell, Windows, NT, WIN 95, DEC path works
- International modem approval

3410 - 10 BaseT Ethernet / V34 modem

GREYMOD/T **£249** (£292.58)

3420 - Combo Ethernet / V34 modem (BAPT and internationally approved)

GREYMOD/C **£259** (£304.33)

THE 2200 PCMCIA SERIES

2200 LAN/Ethernet range

- Fully NE2000 network driver compatible
- Direct connection to 10 Base-T twisted pair Ethernet and/or Thin Ethernet
- DOS, Novell, Windows NT, DEC, OS/2 supported

2210 - 10 BaseT

GREYNET/T **£99** £116.33 inc. VAT

2220 - Combo

GREYNET/C **£105** £129.38 inc. VAT

2230 - Fibre Optic version PCMCIA card

GREYNET/FO **£339** £398.33 inc. VAT

- Automatic installation program
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- NE2000 network driver compatible
- CE approved

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V.32bis Modem + token ring. Data connect rates up to 14,400 bps. Direct cable connection to wall connectors for both LAN and modem - no external devices - Requires one PC slot

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OLICOM00200 (£269.08)

Olicom GoCard Ethernet Adapter

OLICOM00500 116.33

Olicom GoCard Ethernet Modem 33.6

- Compatible with the widest range of portable PCs
- V34 Modem - data connect rates up to 33,600 bps
- Requires one PC Card Slot

£249

OLICOM00400 £292.58

Olicom GoCard Token Ring

- High performance PowerMACH drivers
- Easy to install

£199

OLICOM00300 £233.83

Olicom GoCard TR/Modem 288

- V.34 Modem + token ring. Data connect rates from 300bps to 28,800bps

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OLICOM00100 £398.33

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CREDIT CARD 10/100 ADAPTER

Connect portable PCs to 100Base-TX Ethernet networks with this high performance PC card adapter

- 100Mbps connectivity allows portable PCs to connect to 100Base-TX Ethernet networks and take advantage of higher network bandwidth
- Auto negotiation of 100 or 100Mbps connection rate
- Multi-lingual documentation
- Full driver support, including Novell, Windows 95, and Windows NT

Credit Card Ethernet adapter 10/100 - Upgradable

- Supports 10Base-T or a combination of 10Base-T and 100Base-T

(to upgrade to full 10/100 all you need is a Xircom cable upgrade kit)

Single card RJ45 **£95** (£111.63)

6 pack RJ45 **£539** (£633.33)

Single card Combo **£125** (£146.88)

6 pack Combo **£649** (£762.58)

Upgrade kit **£95** (£111.63)



NEW!

Credit Card ISDN Adapter

£299

XIRPCM/30900 £351.33 inc. VAT

V34 (TP) - 33.6Kbps Credit Card Ethernet+ Modem 33.6

£239

XIRPCM/30000 £280.83 inc. VAT

33.6 Cards 33.6 Combo version

£249

XIRPCM/30100 £292.58 inc. VAT

CREDIT CARD 33,600 MODEM

- Type II PC Card
- V34, 33,600
- Country select function
- WinFax Lite and WinComm Lite
- Plug & Play
- Lifetime warranty

XIRPCM/20000 **£149** £175.08 inc. VAT

MPM41 MULTIPOINT MODEM CARD

Intelligent serial I/O with four V.34 modems integrated on a single ISA card

- Allows you to connect multiple remote users to your network simply and quickly
- Four times more reliable than external modems and serial board combinations

MPM41 multipoint modem card

£1159

XIRISA/MPM41 £1361.83 inc. VAT

Modem Travel Kits

Everything you need to connect your modem to phone systems worldwide

Western Europe kit **£49** £57.58

Eastern Europe and Asia kit **£49** £57.58

CREDIT CARD ETHERNET+ MODEM 33.6

- Full duplex and advanced look ahead pipelining capabilities for optimum Ethernet performance
- Internet access via free CompuServe trial
- Includes Delrina WinFax Lite and WinComm Lite

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watt speakers

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TI Travelmate
5200 P120
Notebook TMS200
£1200 £1410 inc. VAT

POWERMARK NETWORK ADAPTERS

MBNET PCMCIA

- Credit card sized PCMCIA Ethernet card
- Conforms to IEEE 802.3 and fits into Type I, II and III PCMCIA slots
- Windows 95 compatible



It runs with
NetWare



SINGLE **£63** £74.03

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2000C/P PLUG & PLAY

- Improved performance by full-duplex capability (20Mbps) with full downward compatibility
- Full duplex design doubles performance
- Plug and Play, auto-setup
- Jumper or software configuration
- Auto-detection for ISA bus
- Supports 8 IRQs and 8 I/Os
- Smart remote boot ROM
- Uses NE2000 drivers - needs no additional drivers

2000C/P Plug & Play
5 PACK **£89** £104.58

2000C/P Plug & Play £19

MBNET2000C/P £22.33 inc. VAT



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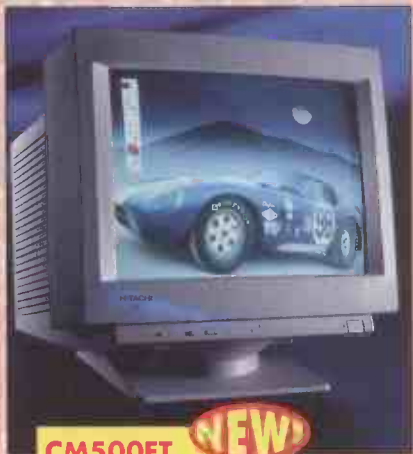


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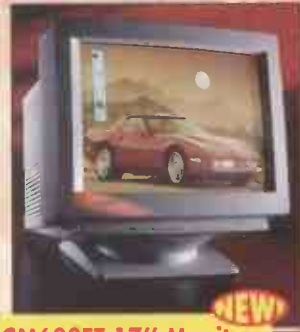
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	Code	Size	Dot pitch	Resolution	Refresh	Tube	Exc. VAT	Inc. VAT	
	17MVXPro2	HITMOH17MVX/PRO2	17"	0.21mm	1280 x 1024	77Hz	FST, TCO92, Nutek	£419	£492.33
	CM500ET*	HITMON/CM500ET	15"	0.23mm	1152 x 870	75Hz	FST, TCO92, Nutek	£229	£269.08
	CM600ET*	HITMON/600ET	17"	0.22mm	1024 x 768	75Hz	FST, TCO92, Nutek	£419	£492.33
	CM802E(T)*	HITMON/MECT	21"	0.21mm	1600 x 1280	75Hz	FST, TCO92, Nutek	£979	£1150.33
	CM611ET*	HITMON/CM611	17"	0.21mm	1280 x 1024	75Hz	FST, TCO92, Nutek	£535	£628.63
	CM2096	HITMON/CM2096	20"	0.27mm	1280 x 1024	75Hz	Standard, Energy Star	£785	£922.38
	CM2011	HITMON/CM2011	20"	0.24mm	1280 x 1024	75Hz	Standard, Energy Star	£869	£1021.08
	CM2112	HITMON/CM2112	21"	0.21mm	1600 x 1280	80Hz	FST, Nutek, TCO92	£1399	£1643.83

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*3 YEAR ON-SITE REPLACEMENT WARRANTY

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- 1020 x 768 up to 80 Hz
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TX530LR £309.03 inc. VAT



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- Fully TCO 92 Compliant
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- Windows 95 Plug & Play

Ergovision 730 TCO
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TX730TCO (£544.03)



Ergovision 740 TCO 95-S

£562

TX740TCO95 (£660.35)

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- 30-85 KHz (Multiscan)
- Multimedia Version
- Fully TCO 95 Compliant
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- Volume & Mute Control



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GTS-3DX+2 **£103** £121.03 inc. VAT

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3D Xpression+ includes Assault Rigs, Mech Warrior 2 and Wipe Out 3D games software

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2D & 3D MULTIMEDIA

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Techniques such as fogging and bi-linear filtering (removing pixel "blockiness") add stunning realism to 3D worlds, that is not bettered at this price! Windows performance is also improved through greater resolution, more colours and higher speed. The VRAM version offers up to 1600 x 1200 resolution at 256 colours and 75Hz refresh.

- Fast Windows, video, DOS and 3D accelerator
- 2MB and 4MB, EDO DRAM and VRAM options
- Hardware 3D functions for detailed 3D worlds
- High resolutions, colour depths and refresh rates
- Windows 95, NT and 3.1x drivers supplied
- Supports Microsoft Direct3D™ designed games

Stealth 3D accelerates games designed for Microsoft's Direct3D™

DIA-5164/3D2400	Stealth 3D 2400	£96	£112.80 inc. VAT
DIA-5164/3D3240	Stealth 3D 3240	£135	£158.63 inc. VAT
DIA-5164/3D3400	Stealth 3D 3400	£175	£205.63 inc. VAT

MATROX MYSTIQUE



The Matrox Mystique is a fast multimedia accelerator for 3D gamers and 2D Windows users. The Mystique sacrifices some image enhancement techniques to give the fastest 3D frame rates available from any 2D/3D accelerator today. Ultra smooth animation in 3D games provides extra realism. Fast Windows acceleration is also achieved, at high colours and resolutions. The Matrox Mystique is the ideal accelerator for 3D gamers who also require fast Windows acceleration.

Matrox Mystique 2MB SGRAM
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 MAT/MYSTIQUE £104.58 inc. VAT



Mystique accelerates games designed for Microsoft's Direct3D™

- Accelerates Windows, video, DOS and 3D accelerator
- Available in 2MB and 4MB SGRAM options
- Ultra fast 3D frame rates for smooth animations
- High resolutions, colour depths and refresh rates
- Windows 95 and 3.1x drivers supplied
- Supports Microsoft Direct3D™ designed games

Software titles included

MAT/MYSTIQUE4MB **Matrox Mystique 4MB SGRAM** **£145** (£170.38)

Monitors & Multimedia



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Powermark Windows 95 Keyboard without rest

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RIGHTEOUS 3D ACCELERATOR



Righteous 3D

True arcade 3D performance for the PC



Standard Tomraider screenshot
 Blocky and jerky animation



Tomraider with Righteous 3D
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Righteous 3D
£175
 ORCRIGHT/3D £205.63 inc. VAT



- No CPU overhead - runs as well on a Pentium 133MHz as on a 200MHz
- No 2D performance loss - runs alongside your existing graphics card
- Fits into any free PCI slot - easy Plug & Play installation
- Winner of several magazine reviews
- The fastest 3D card available for the PC



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CDWE622/R £351.33 inc. VAT

recorders
available. IDE eliminates the
need for expensive SCSI
adapter cards making the CDR
622 excellent value for money.

- IDE-ATAPI interface-no expensive SCSI adapter needed
- x2 Write/ x6 Read
- Track at once, Disc at once & Multisession recording methods
- All major CD-ROM formats supported
- Includes one piece of media and Adaptec Direct CD mastering software

All IDE CD-Recorders are only
supported by Win 95

**DELIVERY
CHARGES**

See
page 40



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Public Sector customers
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Goods are not supplied
on a trial basis

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BANK

Monster! £££

TEAC CD ROM DRIVES

TEAC 12 Speed
CD ROM Drive

£95

CDTEAC512E £111.63 inc. VAT



TEAC

CD-R50-S Quad read/
Quad write
CD Recordable Internal Drive

£549

CDTEAC/R/K £645.08 inc. VAT

Includes cable set, software
drivers and media

Bare drive
£529

CDTEAC/R (£621.58)



TEAC 12 SPEED IDE
CD ROM DRIVE

1.8MB/sec transfer rate

EIDE/ATAPI

Seek time 80ms

Access time 160ms

Tray loading

CD ROM XA, Photo CD and
CD-I compatible

256 Kb buffer

Supports DMA data transfer

Can be mounted vertically or
horizontally

Windows 95 compliant

INTERNAL BARE DRIVE

£95

CDTEAC512I £111.63

TEAC
JUKEBOX
IDE CD ROM

- 8 speed
- 6 disk
- Internal

£149

CDTEAC/JUKEB £175.08



CD ROM DRIVES

IDE	Product Code	Type	Speed	Transfer rate	Access	Loading	Cache	Interface	Int	inc. VAT	Ext	inc. VAT
Powermark 8 speed	MBCDROM/8	IDE	8	1200Kb/sec	135ms	Tray	128Kb	ATAPI	£66	£77.55	-	-
Powermark 10 speed	MBCDROM/10	IDE	10	1500Kb/sec	90ms	Tray	128Kb	ATAPI	£74	£86.95	-	-
Powermark 16 speed	MBCDROM/16	IDE	16	2400Kb/sec	100ms	Tray	128Kb	ATAPI	£97	£113.98	-	-
Pinnacle X-treme 10 speed	CDPHN/X-TREME	IDE	10	1500Kb/sec	89ms	Tray	256Kb	ATAPI	£199	£233.83	-	-
Toshiba XM5522	CDT5522/1	IDE	6	900Kb/sec	150ms	Tray	128Kb	ATAPI	£79	£92.83	-	-
TEAC CD512E 12 speed - BARE DRIVE	CDTEAC/512E	IDE	12	1800Kb/sec	90ms	Tray	250Kb	ATAPI	£95	£111.63	-	-
Toshiba XM5602B 8 speed	CDT5602B/1	IDE	8	1200Kb/sec	120ms	Tray	128Kb	ATAPI	£69	£81.08	-	-
Aztech 12 speed	AZTCD/12	IDE	12	1800Kb/sec	145ms	Tray	128Kb	ATAPI	£99	£116.33	-	-
Warnes 12 speed	CDWEARNES/12I	IDE	12	1800Kb/sec	130ms	Tray	256Kb	ATAPI	£89	£104.58	-	-
Warnes 16 speed	CDWEARNES/16I	IDE	16	2400Kb/sec	130ms	Tray	256Kb	ATAPI	£99	£116.33	-	-

SCSI

NEC 8Xi/e	CDN8X	SCSI	8	1200Kb/sec	99ms	Caddy	512Kb	SCSI	£145	£170.38	£209	£245.58
Panasonic 506 8 Speed	CDPA506/1	SCSI	8	1200KB/sec	135ms	Tray	128Kb	SCSI	£105	£123.38	-	-
Plextor 8x	CDPLEX/8	SCSI	8	1200Kb/sec	99ms	Caddy	512Kb	SCSI	£239	£280.83	£345	£405.38
Toshiba XM-3701B	CDT3701B	SCSI-II	6	1000Kb/sec	135ms	Tray	256Kb	SCSI	£145	£170.38	£239	£280.83

CD ROM JUKE BOXES

Pioneer DRM624X Quad disk	CDPDRM624X	SCSI-II	Q	670Kb/sec	150ms	Caddy	256Kb	SCSI	£394	£462.95	£469	£551.08
Toshiba 3701 7 disk stack	CDT3701B/7	SCSI-II	6	1000Kb/sec	135ms	Caddy	256Kb	SCSI	£1299	£1526.33	-	-
TEAC 6 disk internal	CDTEAC/JUKEB	IDE	8	1200Kb/sec	120ms	Tray	256Kb	ATAPI	£149	£175.08	-	-

RECORDABLE CD ROM DRIVES

TEAC 4x4 CD-R50-S Kit	CDTEAC/R-K	Quad read, dual write with Easy CD software	£549	£645.08	-	-
TEAC 4x4 CD-R50-S Bare	CDTEAC/R	Quad read, dual write	£529	£621.58	-	-
Plasmon 4240 Recorder	CDPLAS/4240E	Quad read, dual write with Incat software	£439	£515.83	£479	£562.83
Plasmon 4400 Recorder	CDPLAS/4400	Quad read, quad write with Incat software	£639	£750.83	£709	£833.08
HP 6020i SureStore	HP556020I		£329	£386.58	-	-

Key to drive speeds: D=Double, Q=Quad, T=Triple, 6=Six speed, 8=Eight speed

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CD ROM
Drives



Certificate no. PS 26535

ISO9002 (Formerly BS5750) registered
for the supply of computers, printer and
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the British Standards Institution to ensure
compliance with this quality standard.

... and
here's what some
of our customers
have said ...

...Just to say
thanks for the
efficient way
your company
handles our
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I have no
problems with
goods or
accounts which
makes my life a
lot easier.

B Murray
Lake District
National Park

...Jane has
kept us up-to-
date with the
developments
and fought our
corner for us...
This level of
customer care is
one of the
reasons we buy
from
Powermark.
Please pass our
thanks on to
Jane.

D R Smith
Executive
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Elstree,
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WD6 3RP

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956 7890

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until despatch

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here's what some
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Over the past
year we have
been dealing with
Powermark for
the supply of the
majority of PC
accessories, e.g
printers, memory
upgrades and
network cards.

On every
occasion we have
found Powermark
to be efficient,
flexible and cost
effective. Their
product range and
delivery cannot be
faulted and on the
rare occasion
where we have
ordered
incorrectly, the
correct product
has been
dispatched the
same day with no
hassle.

Our account
manager, Ian
Sexton, provides
us with an
excellent service
and I have no
hesitation in
recommending
Powermark and
Ian.

E Porter
Tyne & Wear

MEMORY

Monster! £££

JVC DIGITAL VIDEO CAMERA



JVC

JVC brings you the worlds
smallest* and lightest pocket
sized digital video camera

Digital technology ensures superior picture and
sound quality, sophisticated special effects and PC
compatibility for Multimedia applications.

The GR-DV1 incorporates 4:2:0 Digital recording
system, a third of an inch CCD Image sensor,
which gives near broadcast picture quality. PCM
Digital sound is recorded on either 2 or 4
channels. The camera is very user friendly and
has 100x Digital zoom with a built in Image
stabiliser. The snapshot mode can capture a
total of 720 images on a 60 minute tape - this
capture facility can be linked with other related
capture hardware or software. On playback,
using the remote control you can pin-point a
portion on the screen and zoom in up to 10
times. You can also shift the image up, down,
left or right.

The camera also offers 12 Digital effects and 18
different scene transitions, most of which can be
used in playback and editing. The potential for
Multimedia applications has been expanded by
the J-LIP terminal on the docking station,
developed by JVC. J-LIP** allows the control of
A/V equipment and PC software for editing.

* As of December 1996

** Only for use with Microsoft Windows 3.1 or Windows 95



Accessories supplied: Docking station, multi
brand remote (for the docking station), cam
stand, lithium-ion battery, AC power adapter,
soft camera case, AV cable for docking station
(RCA terminal), AV cable for DV1, S-video
cable, Digital video cassette, editing cable.



JVC GR-DV1
£1359

JVC/GR-DV1 £1596.83 inc. VAT

Format DV
Power Source DC 3.6V
Cassette Mini DV type
Max. recording time 60 minutes
Image sensor 1/3" CCD (670,000)
Lens F1.6 = 4.5 - 45mm
Viewfinder 0.55 electronic colour viewfinder
Minimum lux Less than 1 lux in slow-shutter mode
Audio PCM digital stereo (2-ch, 45 kHz, 16-bit/4-ch, 32 kHz, 12-bit)
Zoom 10X optical 20X digital and 100 digital
Dimensions 43 x 148 x 88 mm
Weight Approx. 450g (or 520g with battery, tape and handstrap)

KODAK DIGITAL CAMERAS

Kodak *ds*
digital science™

New
Lower
Prices!

Kodak DC25
• 2MB internal storage
• Use optional 2MB Kodak
picture card compact FLASH
memory cards to store
even more pictures

• 24-bit
• Resolution up to 493 x 373
• Built-in colour LCD
• Kai's Power Goo software

£325

KODAKDC25 £381.88 inc. VAT

**2MB Compact Flash
PCMCIA Card and Holder**
£115 £135.13

KODAK/1479906

**Kodak Digital Science
DC20 Camera**

- Very simple to use thanks to a focus free lens and automatic exposure facility and it stores up to 16 images (1MB memory)
- Turn your images into digital photographs and print or Email them - resolution 493 x 373 (in high mode)
- Kai's POWER GOO - Professional Image editing software
- Create custom slide shows
- The mobile image solution - extremely compact (31mm x 102mm x 61mm)

Includes: Macintosh and PC cable, 3V lithium battery, User guide, Photo-Enhancer software

KODAKDC20 **£159** £186.83

**Kodak Digital Science
DC50 Camera with zoom**

- 1MB standard memory - unlimited memory storage with PCMCIA memory cards
- 3x automatic zoom lens with close-up
- PHOTO-ENHANCER software
- 756 x 504 resolution

KODAKDC50 **£499** £586.33

AC Power Adapter £69 £81.08

KODAKCSW/AC

4MB PCMCIA Card £169 £198.58

KODAK/8027136



SANYO DIGITAL CAMERA

SANYO

Introducing Image PC -
the digital camera from
Sanyo that opens up a
colourful new world of
possibilities for PC
users at work and home



TRUE
640 x 480
VGA
resolution

**image
PC™**

POINT AND SHOOT - Now you
can capture vibrant colour images at any
time, any place. All you have to do is
point and shoot.

CONNECT TO YOUR PC - Ideal
for home and business use, your Sanyo
Image PC gives you the ability to add
stored images to newsletters, reports or
even personalised birthday cards.

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ENHANCE** - With your Sanyo Image
PC, you can preview your pictures in full
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decide what images to keep before
downloading data. Once on your PC
you can use the photo enhancement
software that is supplied to edit the
picture.

**DRAG AND DROP, CUT AND
PASTE** - Get all the functionality with
Chelsea image editing software.

PRINT OR E-MAIL - Produce fun
mail shots, clever presentation or e-mail
captured images.

**Sanyo Image
PC Digital
Camera**

£299

SANYO/IMAGE £351.33 inc. VAT

- 24-bit full colour
- 1MB flash memory
- Progressive scan CCD
- Stores 16 high resolution or 32 standard resolution image files
- Chelsea photo enhancement software supplied
- Optional 2MB or 4MB memory expansion
- True 640 x 480 VGA resolution

32

**DELIVERY
CHARGES**
See
page 40

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CASIO DIGITAL CAMERA

CASIO

QV-10A DIGITAL CAMERA (Mac)

CASIO/QV10A2 **£285** £334.88

QV-10A MAINS ADAPTER

CASIO/QV10/ADK6SEL **£12** £14.10

QV-300

2.5" LCD screen with wide angle and telephoto lens

CASIO/QV300 **£499** £586.33

QG-100 MINI COLOUR PRINTER

Print passport-size photos

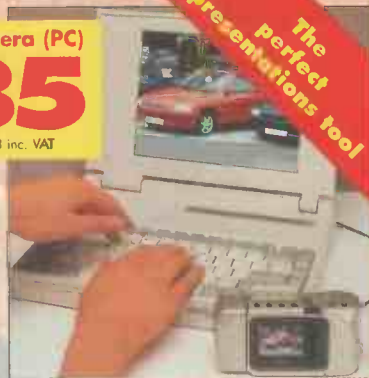
CASIO/QG-100 **£165** £193.88

QV-10A Digital Camera (PC)

£285

CASIO/QV10A1 £334.88 inc. VAT

- Built-in high resolution colour 1.8" TFT LCD screen
- 96 image memory
- 270 degree lens rotation
- Transfer images to PC/Windows
- Apple Mac - TV/Video
- Any image delete function
- Self timer
- Multi image display
- Close-up macro lens
- 16.7 million colours (24 bit)
- Exposure correction control
- Multi format file storage



The perfect presentations tool

NEW! Casio QV-100 Digital Camera

£409

CASIO/QV100A1 £480.58 inc. VAT

FAX MACHINES

BROTHER FAX MACHINES

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Brother Fax-590DT

Brother's thermal fax/phone with quality digital answering machine

BRO/590DT **£299** £351.33 inc. VAT

Brother Fax-1700P

The quality high performance plain paper fax and answer machine that does it all!



- 9 second transmission speed*
- Built-in digital answer machine
- 50 page memory*
- Remote message retrieval

BRO/1700P **£429** £504.08 inc. VAT

Brother Fax-8000P

Advanced laser technology with optional PC interface

BRO/8000P **£649** £762.58 inc. VAT

*Based on Brother standard test chart

Brother Fax-1200P

The 1200P plain paper fax is packed with features offering convenience, quality output and great value.

- 15 second transmission speed*
- 10 page memory*
- Fax/Telephone switch
- Fixed cost per copy
- 200 Sheet A4 paper cassette
- 70 speed dial buttons

£329

BRO/1200P £386.58 inc. VAT

Brother Fax-510

Entry level thermal fax

BRO/510FAX **£189** £222.08 inc. VAT

Brother Fax-570

The highly featured yet simple to use fax with paper cutter and caller ID

BRO/570FAX **£199** £233.83 inc. VAT

XEROX FAX MACHINES

XEROX

Xerox R7088

The fax bringing ease of use to the personal user

- Fast transmission time
- Answerphone interface
- 10 page document feeder

£399

XEROX/R7088FAX £468.83 inc. VAT

Xerox 7090

- Plain paper fax
- 20 page document feeder
- 250 sheet paper cassette
- 80 number Autodialler

XEROX/7090FAX **£499** £586.33 inc. VAT

Xerox Pro 610

Take care of all your documents with the combined power and capabilities of fax, printer, copier, and scanner.



XEROX/PRO610 **£1769** £2078.58 inc. VAT

SANYO FAX MACHINES

SANYO

SANYO SFX 210

Thermal Fax with Digital Telephone Answering System

- Outgoing message-30 sec
- 60 incoming messages-14 mins
- Remote Control
- Built-in telephone with on hook dialling and conversation
- Copy Function

SANYO/SFX210 **£239** £280.83 inc. VAT

Sanyo SFX 110

Thermal Fax Machine

- Built-in telephone with on hook dialling and conversation
- Automatic paper cutter
- Auto 10 page document feeder
- Copy Function
- Mercury compatible

£199

SANYO/SFX110 £233.83 inc. VAT



OKI FAX MACHINES

OKI

OKIFAX 460

Your economic desktop partner

- Thermal fax with answering machine

OKI/460FAX **£235** £276.13 inc. VAT



OKIFAX 740MF

The 2-in-1 fax/colour printer

- 20 page auto document fax header
- 600 x 600 dpi printer resolution
- 1 year onsite warranty

OKI/740MF **£749** £880.08 inc. VAT

OKIFAX 740

The affordable plain paper fax
The OKIFAX 740 offers the convenience of plain paper faxes with the quality and economy of inkjet printing.

- 512 Kb memory expandable to 1.5 Mb
- Automatic dialling
- Excellent paper handling

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I would like to thank Powermark for the way they handled my rather small order. The sales representative was helpful and knowledgeable, the price competitive and the delivery was not only prompt (next day) but included instructions and wrist strap.

Well done!

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**HP DESKJET
690C**

- 5ppm in black
- 2ppm in colour
- 600 x 600 dpi in black
- 600 x 300 dpi in colour with PhotoRet
- 512KB memory
- 30 TrueType fonts

Printer
PLUS
SupportPack
only £224
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£189

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SupportPack for HP
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3 years on-site
maintenance*

HPWARR/DJ690C **£40** (£47.00)

HP DeskJet 690C
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HPDJ690C+SP **£224** (£263.20)

* Must be purchased within 30
days of original purchase

HP SupportPack

- On-site warranty by HP engineers
- Recommended for all HP Laserjets, Deskjets & Copyjets

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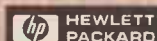
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HP PRINTERS



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HP DeskJet 870Cxi

Premium personal inkjet
printer for professionals

- 8ppm in black, 4ppm colour
- 600 x 600 dpi in black
- 600 x 300 dpi in colour
- 126 TrueType fonts
- Lotus Wordpro, 1 month Compuserve FREE trial included

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HPDJ870Cxi £350.15 inc. VAT

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SupportPack
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SupportPack for 870Cxi
3 years on-site maintenance*

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* Must be purchased within 30 days of
original purchase

**HP DESKJET
340 COLOUR**

- 600 x 600 dpi in black
 - 13 scalable Windows fonts
- HP DESKJET 340 NOW
WITH CUT SHEET FEEDER**

HPDJ340 **£155** £182.13 inc. VAT

HP DESKJET 340 with full
colour kit and IR adapter
for cable-free printing

HPDJ340C **£179** £210.33 inc. VAT

**HP DESKJET
1600C**

- 600 x 600 dpi in black

HP DESKJET 1600C

HPDJ1600C **£825** £969.38 inc. VAT

HP LASERJET 6P

HP Laserjet 6P

£455

HPLJ6/P £534.63 inc. VAT

- 600 x 600 dpi
- 8 pages per minute
- REt technology incorporated to enhance resolution
- 2MB RAM
- PCL6 compatible

HP LASERJET 6MP - POSTSCRIPT

HPLJ6MP **£559** £656.83 inc. VAT



HP DeskJet 693C
The ideal family printer
Comes with the HP Home
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(CD), PrintPaks Family Fun
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£215

HPDJ693C £252.63 inc. VAT



**HP DeskJet
820Cxi**

High performance
personal inkjet printer

- Only Windows compatible
- 6.5 ppm in black
- 4ppm colour
- 600 x 600 dpi black
- 600 x 300 dpi colour
- 50 TrueType fonts

£219

HPDJ820Cxi £257.33 inc. VAT

**HP LASERJET
5L**

- 4 pages per minute
 - 600 x 600 dpi in black
 - 1MB RAM
 - New innovative style case
- HP LASERJET 5L

HPLJ5L **£275** £323.13 inc. VAT

**HP5
COLOUR**

HP5 COLOUR

£4159

HPJCOLJ5 £4886.83 inc. VAT

**HP5M COLOUR
(POSTSCRIPT)**

£5129

HPJCOLJ5M £6026.58 inc. VAT

**HP DESKJET
400**

- 600 x 360 dpi in black
- 300 x 300 dpi in colour
- 59 page sheet feeder

HP DESKJET 400

HPDJ400 **£109** £128.08 inc. VAT

HP DESKJET 400 Colour

HPDJ400COLOUR **£119** £163.33 inc. VAT

**HP LASERJET
5**

HP LASERJET 5

HPLJ5 **£865** £1016.38 inc. VAT

HP LASERJET 5N

HPLJ5N **£1015** £1192.63 inc. VAT

**HP LASERJET
5Si**

- 24 pages per minute
- 600 dpi
- 4MB RAM
- 1 year on site warranty

HP LASERJET 5Si

HPLJ5i **£1979** £2325.33 inc. VAT

HP LASERJET 5SiM

HPLJ5iM **£2699** £3171.33 inc. VAT

HP OFFICEJET 350

The complete
office solution

- 600 x 300 dpi
- High quality printer
- Integrated fax
- Photocopier
- Scanner

HP OFFICEJET 350

£459

HPOFFICEJLX £539.33 inc. VAT



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**DELIVERY
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page 40



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goods subject to a
restocking fee.
Goods are not supplied
on a trial basis

BANK Monster! £££

BROTHER PRINTERS



'Lowest cost of ownership'
PC Magazine, October 96

HL - 730 laser printer
The solution to your demanding print needs - the Brother HL730 printer offers flexible, high print quality and at a truly affordable price.

NEW LOW PRICE!
£269

BR0/HL730 £316.08 inc. VAT



brother

Brother HL-1660 Printer

- 16ppm printing
- Up to 1200 dpi printing
- 6000 page high-capacity printing cartridge

BR0/HL1660 **£999** £1173.83

Brother HL-760 Printer

- 6ppm printing
- 1MB memory
- 1200 x 600 (WIN), 600 x 600 (DOS)
- 12 month return-to-base warranty

BR0/HL760 **£320** £376.00

HL - 1260e laser printer

High volume and capacity printing

- 12 pages per minute printing
- 1200 x 600 dpi
- High volume paper input - 650 sheets as standard
- Duplex option
- Full network connectivity

£825

BR0/HL1260 £969.38 inc. VAT

- Looks professional
- 600 x 600 dpi in Windows
- Prints quickly
- 6ppm printing
- Printing flexibility
- 512Kb memory as standard
- Runs economically

MFC 9000 multifunction printer Fax • Scanner • Copier

- 6ppm - 600 dpi

£709

£833.08 inc. VAT

BR0/MFC9000

HEWLETT PACKARD SCANNERS



HP ScanJet 5P

£245

HPSJ5P £287.88 inc. VAT

HP ScanJet 4C Graphic Pro

- Adobe Photoshop Pro
- HP DeskScan II

HPSJ4C/GRAPHICPRO **£715** £840.13

HP ScanJet 4C Office Pro

- Caere OmniPage Pro
- DocuMagix PaperMaster
- HP AccuPage technology

HPSJ4C/OFFICEPRO **£715** £840.13

LOWER PRICES!

HP SCANJET 4S

HPI4S **£130** £152.75 inc. VAT

HP SCANJET 4Si

- 400 dpi enhanced to 1200 dpi
- Up to 12 pages per minute
- Includes award winning Visioneer Paperport V3.0 and Autolaunch software

HPSJ4Si **£1575** £1850.63 inc. VAT



HP ScanJet 4c
£549

HPSJ4C £645.08 inc. VAT

- 600 dpi enhanced to 2400 dpi
- 30-bit colour gives you 1 billion colours
- Up to 18 pages per minute
- Caere OmniPage Limited Edition and Visioneer Paperport V3.0 software

HP AUTOMATIC DOCUMENT FEEDER

HPSJ4C/ADF **£318** £373.65 inc. VAT

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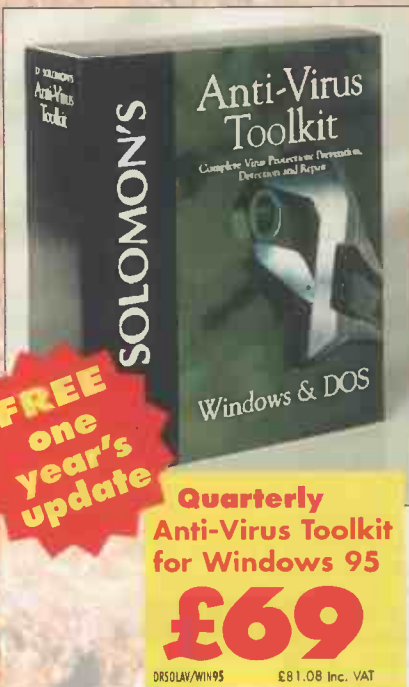
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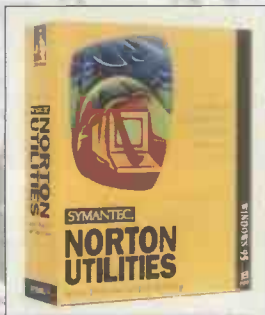
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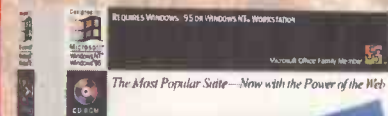
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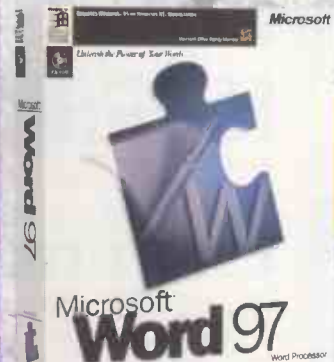
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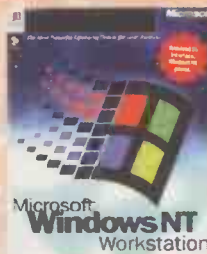
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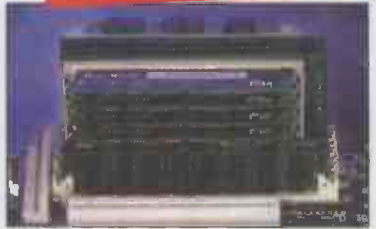
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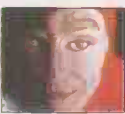
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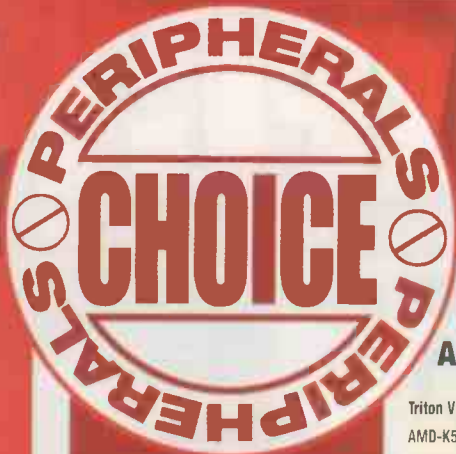
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32Mb	NW2034U	MEK430	KTT-610/32	£329	£386.58		
DIGITAL	HINOTE VP 520, 525 & 535	8Mb	FR-PCP9M-BA	MEK500	KTV-VP500/8	£82	£96.35
	16Mb	FR-PCP9M-BB	MEK505	KTV-VP500/16	£156	£183.30	
	32Mb	FR-PCP9M-BC	MEK510	KTV-VP500/32	£291	£341.93	

Same-day despatch on all stock

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Huge stocks available for next-day shipping

MOTHERBOARD BUNDLES

AMD-K5 100 BUNDLE

Triton VX Pentium Motherboard	£55 + VAT
AMD-K5 100 CPU Processor	£48 + VAT
4 Chip SIMM Saver	£19 + VAT
1Mb PCI 32Bit Video Card	£19 + VAT
Heatsink & Fan	£4.26 + VAT
Total individual cost	£145.23 + VAT
Total bundle cost	£124.00 + VAT

PENTIUM P133 BUNDLE

Triton VX Pentium Motherboard	£55 + VAT
Intel P133 CPU Processor	£95 + VAT
8 Chip SIMM Saver	£29 + VAT
2Mb PCI 64Bit Video Card	£35 + VAT
Heatsink & Fan	£4.26 + VAT
Total Individual cost	£218.26 + VAT
Total bundle cost	£199.00 + VAT

PENTIUM PRO 180 BUNDLE

Pentium Pro Motherboard	£125 + VAT
Intel Pro 180 CPU Processor	£319 + VAT
8 Chip SIMM Saver	£29 + VAT
Video Logic Grafix 600 2.25 V/Card	£79 + VAT
Heatsink & Fan	£9 + VAT
Lotus SmartSuite	£Bundle offer
Total individual cost	£612.00 + VAT
Total bundle cost	£585.00 + VAT

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Massive Investment into our technical support areas sees one fully qualified member of staff employed for every three sales-people, with all lines open from 9am to 9pm every day.

4 UPGRADES & BUNDLES

AMD K5-100

4 Chip SIMM Saver

Heat Sink & Fan

BUNDLE SAVE
£24.95
£124 + VAT

Heat Sink & Fan P133

Heat Sink & Fan

BUNDLE SAVE
£22.63
£199 + VAT

8 Chip SIMM Saver

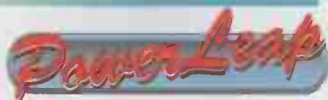
Heat Sink & Fan PRO 180

Heat Sink & Fan

BUNDLE SAVE
£29.72
£585 + VAT

8 Chip SIMM Saver

POWERLEAP - FOR THE POWER HUNGRY



UPGRADE YOUR EXISTING CPU IN LESS THAN 10 MINUTES!
MEDIAPORCE POWERLEAP CPU UPGRADES MAKE IT AS EASY AS 1, 2, 3...



Installation in less than 10 mins – as easy as 1, 2, 3...

1. Locate existing CPU or overdrive socket and remove using tool supplied.



2. Align Pin 1 on the powerleap module with the CPU or overdrive socket and place the upgrade into the socket.



3. Firmly press the Powerleap module into the socket. The upgrade is now complete and you can now turn on your PC and enjoy the massive increase in computing power!



Upgrade your 486 SX/DX system to a 586/133Mhz
POWERLEAP 586/133

- Increases existing CPU performance by up to 350%
- 16K Internal cache
- Gives systems ultra high maths performance
- Plug and Play – no software needed
- 5yr warranty

00100 PowerLeap 586/133

EX. VAT £79 INC. VAT £92.83



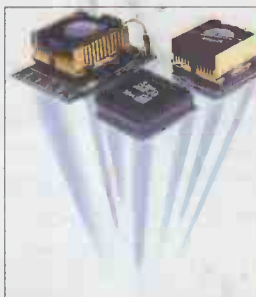
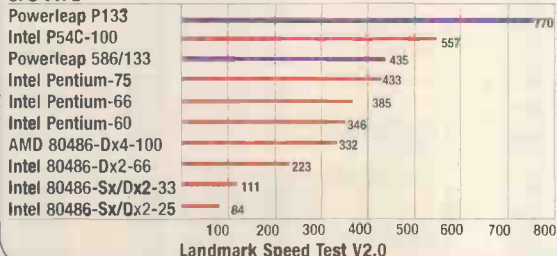
Upgrade your Pentium 60/66 system to a Pentium 133Mhz
POWERLEAP P133

- Maximises investment in existing Pentium hardware
- Higher reliability due to lower operating voltage
- Plug and Play – no software needed
- 5 year warranty

00105 PowerLeap P133

EX. VAT £145 INC. VAT £170.38

CPU TYPE



The Pentium™ OverDrive processor is available in four versions, based on your system's bus speed

CODE	SPEED	WITH O/D SOCKET	WITHOUT O/D SOCKET
INTEL OVERDRIVE CPUs			
0D20/21	DX/4 100MHZ	£109	£128.08
0D25/30	Pentium 63/83MHZ	£85	£99.88
INTEL PENTIUM OVERDRIVE CPUs			
0D35	INTEL Pentium Overdrive	P60 to P120	£159
0D40	INTEL Pentium Overdrive	P66 to P133	£159
0D45	INTEL Pentium Overdrive	P75 to P125	£159
0D50	INTEL Pentium Overdrive	P90 to P150	£199
0D55	INTEL Pentium Overdrive	P100 to P166	£269

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MOTHERBOARDS

Intel Triton VX Pentium Motherboard

media
FORCE

The Intel Triton 1430VX mainboard is a high-performance mainboard based on the advanced Pentium™ microprocessor, the PCI Local Bus & the Intel 1430VX chipset. The mainboard offers a high degree of flexibility in configuration & is fully IBM PC/AT compatible.

CPU

Supports either 75/90/100/120/133/166/180/200 Mhz PENTIUM™ CPUs with 321pin ZIF socket and Voltage Regulator Module (VRM). Supports Pentium P55C Supports Cyrix 6x86, AMD K5 CPUs. MMX™ Compatible.



System BIOS

System BIOS supports NCR810 SCSI BIOS firmware and Green feature function, Plug and Play Flash ROM (option) System BIOS support 4 IDE hard disk drivers that don't need device driver for s/w application, the capacity each hard disk can large than 528Mb up to 8.4Gb

M99-2
£55
ex VAT

System Memory

Uses 72-pin SIMM modules x 4 auto banking in multiple configuration up to 128Mb. Supports both Fast Page Mode and Extended DATA. Output (EDO) DRAM module. Supports SDRAM/EDO DRAM. Page Mode DRAM use 168-pin DIMMsx2

Cache

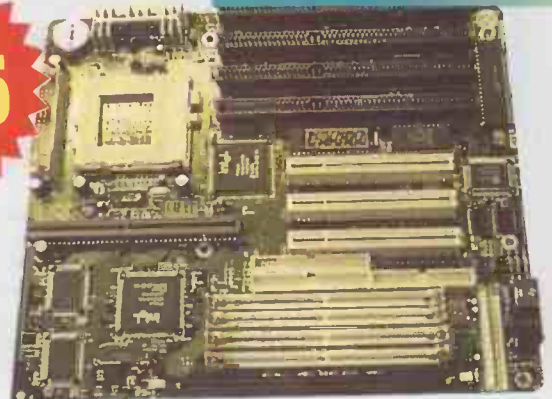
Supports cache module socket, cache module options 256Kb or 512Kb pipeline burst SRAM module

Architecture

3 PCI Local Bus slots, and 4 x 16 bits ISA Bus slots
All 3 PCI slots support Master mode

I/O SPEC.

PCI Bus master IDE interface on board with two connectors support 4 IDE devices in 2 channel, the PCI IDE Controller supports PIO Mode 0 to Mode 4 at maximum transfer rate of 16.67Mb/s and Bus master IDE DMA Mode 2. On board super Multi-I/O chip that support 2 serial port with 16550 Fast UART compatible, 1 parallel port with EPP and ECP capabilities, and a floppy disk drive interface. Supports PS/2™ connector. Supports the Universal Serial Bus (USB) (option)



MOTHER
BOARDS

5



M101
£125
ex VAT

Pentium Pro Motherboard

CPU Supports Pentium Pro 150/166/180/200, Zif socket 8 VRM included.

Architecture 4 PCI slots & 3/4 ISA slots.

Cache Supports either 256K or 512K Internal CPU Cache

System Memory Uses 72-pin SIMM modules x 4 auto banking in multiple configuration up to 256MB. Supports both Fast page Mode & EDO DRAM.

I/O SPEC. Supports 4 IDE devices, 2x floppy disk drives, 2x 16550 UART fast serial port EPP/ECP high performance parallel port. Supports USB.

System BIOS Supports Flash ROM, Plug & Play, Green Feature, NCR 810 SCSI BIOS.

Award version 4.51PG PNP V1.0A

PCB Size 22cm x 28cm

media
FORCE

QDI Speed Easy Jumperless Motherboard



jumper-free for CPU speed setting

In today's ever more complicated world of computing Choice Peripherals are delighted to announce the

- launch of the world's first jumperless motherboard.
- The correct CPU speed can be set quite simply in BIOS
- Users can select the CPU speed at any time without opening the system case or needing to refer to a complicated user manual
- BIOS can automatically set the CPU core and IO voltage according to the CPU type selected
- Reduces any chance of a wrongly set up motherboard

M201
£115
ex VAT

QDI



Gigabyte Motherboard



M92-HX5
£105
ex VAT

CPU Supports Intel, Cyrix and AMD processors 75-200MHz. Zif Socket 7. MMX™ Compatible.

Architecture 4 PCI slots & 4 ISA slots.

Cache 512K Pipeline Burst standard.

I/O SPEC. Supports 4 IDE devices, 2x floppy disk drives, 2x 16550 UART fast serial port EPP/ECP high performance parallel port.

System Memory

Uses 72-pin SIMM modules x 6 auto banking in multiple configuration up to 512KB. Supports both Fast page Mode & EDO DRAM.

System BIOS

128KB Flash EEPROM. Award PCI BIOS with Green PnP feature support.

PCB Size 22cm x 28cm

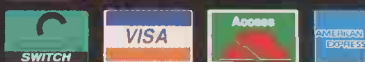


	EX. VAT	INC. VAT
M47-E 486 PCI M/B 256k cache, I/O onboard with Cyrix 586-100 MHz	£69	£81.08
M96 Elite P75-200 Motherboard 256k PLB IDE I/O Triton 2HX Chip Set	£99	£116.33
M96V Elite P75-200 Motherboard 256k PLB IDE I/O Triton 2VX Chip Set	£97	£113.98

	EX. VAT	INC. VAT
CM2-VX 256k Pipeline Burst Cache Module	£10	£11.75
CM3 512k Pipeline Burst Cache Module	£20	£23.50
M92-HX5 Gigabyte High Quality P75-200 512K PLB IDE I/O onboard Triton 2HX Chipset	£105	£123.38

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6 ACCESSORIES

FACTORY

Huge stocks available for next-day shipping

CONTROLLERS

CODE	DESCRIPTION	EX. VAT	INC. VAT
BUSLOGIC CONTROLLER CARDS			
IC15-BL	KT545C ISA 16BIT SCSI ADAPTOR	£135	£158.63
IC20-BL	KT946C PCI SCSI ADAPTOR	£145	£170.38
IC25-BL	KTC930C PCI ULTRA SCSI ADAPTOR KIT	£99	£116.33
IC35-BL	KTC950C PCI ULTRA SCSI WIDE ADAPTER KIT	£165	£193.88
ISA & VLB I/O CARDS			
IC90	ISA SUPER I/O CARD 2FDD/2HDD/2S/1P/1G	£12	£14.10
IC60	Vesa Super I/O (M3) 4HDD/2FDD/2S/1P/1G E-IOE	£19	£22.33



CODE	DESCRIPTION	EX. VAT	INC. VAT
ADAPTEC CONTROLLER CARDS			
IC18	1515 Ultra total connect kit	£53	£62.28
IC19	1522 Ultra total connect kit	£93	£109.28
IC25	1542 CP ISA SCSI Controller Card	£119	£139.83
IC30	1542 CP ISA SCSI Controller Kit	£153	£179.78
IC40	2742T EISA SCSI Controller Kit	£215	£252.63
IC41	2920 Controller Kit	£95	£111.63
IC45-U	2940 Ultra SCSI Kit	£153	£179.78
IC46	2940 Ultra Wide SCSI Controller Kit	£179	£210.33
IC42	Slim SCSI PCMCIA Controller	£111	£130.43
IC48	348 Parallel SCSI	£74	£86.95
IC49	358 Mini SCSI Plus	£75	£88.13
IC51	3940U	£254	£298.45
IC52	3940UW	£308	£361.90
IC100	Airport 1000	£28	£32.90
IC105	Airport 2000	£41	£48.18
IC110	Airport 2500	£61	£71.68
S350	EZ-SCSI Software V4.0	£43	£50.53

VIDEO CARDS

CODE	DESCRIPTION	EX. VAT	INC. VAT
Diamond			
V52	DIAMOND STEALTH 64 VRAM VIDEO 2MB	£125	£146.88
V-D5	DIAMOND STEALTH 1MB DRAM 2000 PCI	£46	£54.05
V-D10	DIAMOND STEALTH 2MB DRAM 2000 PCI	£57	£66.98
V-D15	DIAMOND STEALTH 1MB EDO 2001 PCI	£47	£55.23
V-D20	DIAMOND STEALTH 2MB EDO 2001 PCI	£57	£66.98
V-D25	DIAMOND STEALTH 3D 2000 2MB EDO	£70	£82.25
V-D26	DIAMOND STEALTH 3D 3000 2MB VRAM	£125	£146.88
V-D27	DIAMOND STEALTH 3D 3000 4MB VRAM	£205	£240.88
V-D28	DIAMOND STEALTH MONSTER 3D 4MB EDO	£169	£198.58
V-100	DIAMOND edge 3D 2120XL 1MB DRAM	£135	£158.63
Hercules			
V201	HERCULES STINGRAY 64/VIDEO PCI 2MB	£55	£64.63
V202	HERCULES TERMINATOR 3D 40ns EDO 2MB	£84	£98.70
V203	HERCULES TERMINATOR 3D 40ns EDO 2MB With MPEG Hardware 2MB	£142	£166.85
V204	HERCULES TERMINATOR 3D 40ns EDO 4MB	£97	£113.98
V205	HERCULES 128 Video PCI 2MB	£93	£109.28
V206	HERCULES 128 Video PCI 4MB	£96	£115.15
BTX			
V51	BTX 64BIT 1MB 2MB PCI	£30	£35.25
V51-M	BTX 64BIT MPEG Card 1MB 2MB PCI	£35	£41.12
MediaFORCE			
V52	PCI Vision S3 64BIT Card 1MB 2MB PCI	£27	£31.72
V54	PCI Vision S3 64BIT Card 2MB PCI	£34	£39.95
V300	PCI Vision S3 Virge 3D Card 2Mb EDO	£49	£57.58
Trident			
V45	TRIDENT 9440 32BIT 1MB 2MB PCI	£32	£37.60
V14	TRIDENT 1MB ISA VGA CARD	£29	£34.08
Cirrus Logic			
V46	Cirrus Logic 5434 64 1MB 2MB PCI	£19	£22.33
V49	Cirrus Logic 5436 64BIT 1Mb	£27	£31.72
V49-C	Cirrus Logic 5446 64BIT 1MB MPEG	£30	£35.25
V49-M	Cirrus Logic 5440 32BIT 1MB MPEG	£22	£25.85
Orchid			
V10	Rightous 3D Card Games Acceleration	£185	£217.38
Video Logic			
V87	GrafixStar 450 3D Acceleration Card	£Call	£Call
V88	Apocalypse 3D	£137	£160.98
Video Upgrades			
V65	1MB DRAM Upgrade Chips	£9	£10.57
V66	1MB EDO Upgrade Chips	£10	£11.75
V57	Captivator Pro for GS 700	£159	£186.83
V58	VMC Module for GS 700	£42	£49.35
V72	TV Tuner for VMC Module GS 700	£179	£210.33
V79	GrafixStar 700 2Mb Upgrade	£145	£170.38
V71	Diamond Stealth 2Mb VRAM Upgrade	£99	£116.32
V97	GrafixStar 600 2Mb Upgrade	£59	£69.33
V120	Diamond Edge 2Mb VRAM Upgrade	£199	£233.83
V126	Matrox Millennium 2Mb Upgrade	£63	£74.03
V131	Matrox Mystique 2Mb Upgrade	£49	£57.58

CABLES & ACCESSORIES

CODE	DESCRIPTION	EX. VAT	INC. VAT
ACS	1.5m Parallel Printer Cable	£3	£3.53
ACS-E	Enhanced Bi-Tronics Printer Cable	£7	£8.23
AC11	3m Parallel Printer Cable	£4	£4.70
AC10	5m Parallel Printer Cable	£5	£5.88
AC15	2-1 Printer Switch Box	£9	£10.58
AC20	4-1 Auto Printer Switch Box	£16	£18.80
AC25	25 Pin Male to 25 Pin Male Cable (suit. for above printer switch box)	£2	£2.35
AC30	Internal SCSI Cable	£3.50	£4.11
AC31	Serial Cable (Male to Female 28-Pin)	£2.99	£3.51
AC35	IDE Cable	£1.50	£1.76
AC35-7	0.7M IDE Cable (3 Heads)	£5.00	£5.88
AC40	Floppy Drive Cable (5 Head)	£2.50	£2.94
AC50	PC to Monitor Power Cable	£1.99	£2.34
AC55	Brit. Mains 3 Pin Fused Power Cable	£2.50	£2.94
AC60	Keyboard Extension Cable	£2.90	£3.41
AC65	VGA/SVGA Monitor Extension Cable	£3	£3.53
AC45	PS/2 Keyboard Adaptor (Std. keyboard to PS/2)	£3	£3.53
AC80	Box of 10 x 1.44Mb Formatted Disks	£1.99	£2.33
AC81	10 x Fuji 1.44Mb Formatted Disks	£4.99	£5.86
AC70	High Quality Mouse Mat	£1	£1.18
SCSI Cables			
AC30-3	Int. SCSI Cable 3 Heads	£5	£5.88
AC30-4	Int. SCSI Cable 4 Heads	£12	£14.10
AC30-5	Int. SCSI Cable 5 Heads	£15	£17.63
AC30-6	Int. SCSI Cable 6 Heads	£19	£22.33
AC30-8	Int. SCSI Cable 8 Heads	£23	£27.08
AC30-E1	Ext. SCSI Cable HP500M-50 Cent	£19	£22.33
AC30-E2	Ext. SCSI Cable HP500M-HP500M	£23	£27.03
TOM & JERRY MOUSE MATS			
AC71	"Real Mouse" Mat	£3.99	£4.69
AC72	"President" Mat	£3.99	£4.69
AC73	"Chase" Mat	£3.99	£4.69

JOYSTICKS

CODE	DESCRIPTION	EX. VAT	INC. VAT
J10	Rockfire Fire Dragon	£25	£29.38
J15	Rockfire H/Performance Joypad	£6	£7.05
J16	Rockfire Maya Fighter	£29	£34.08
J17	Rockfire Avant Garde	£19	£22.33
J20	Rockfire Reversible Joypad	£6	£7.05
J25	Rockfire U/F Shuttle Joypad	£13	£15.28
J30	Rockfire K/B Emulator C/pad	£19	£22.33
J35	Rockfire Glide Zipper 1	£15	£17.63
J40	Rockfire Glide Zipper 2	£27	£31.73
J50	Rockfire 4 Button Joystick	£8.50	£9.99
J55	Rockfire As above with throttle	£10	£11.75
J45	Trust Extreme Joystick keyboard emulator and hat	£49	£57.57
J41	Trust Predator Joystick	£18	£21.15
J70	Trust Killer Cobra	£15	£17.63
J60	Microsoft Sidewinder Pro 3	£36	£42.30
J61	Microsoft Sidewinder	£19	£22.13
J62	Microsoft Sidewinder Game Pad	£25	£29.38
J63	Microsoft Sidewinder Pro with HellBender	£49	£57.58
J56	F1 Simulator 10" Genuine Race Wheel & Pedals	£220	£258.50



FLOPPY DISKS

CODE	DESCRIPTION	EX. VAT	INC. VAT
DRIVES			
FDS-S	MITSUMI 1.44MB 3.5"	£15	£17.63
FDS-S	SONY 1.44MB 3.5"	£15	£17.63
FDS-P	PANASONIC 1.44MB 3.5"	£19	£22.33
	DIE CAST METAL CHASSIS	£32	£37.60
F010	MITSUMI 1.2MB 5.25"	£32	£37.60
ACCESSORIES			
UT11	3.5" TO 5.25" M/KIT	£2	£2.35
AC40	LONG 5 HEAD FLOPPY CABLE	£2.50	£2.94
AC-PS1	POWERSPLITTER	£4	£4.70
D10	Disk Storage Box	£3	£3.53

KEYBOARDS

Microsoft Natural Keyboard

- Unique contoured design encourages a balanced more natural hand & wrist position
- Intellitype software
- 104 key design - extra function keys



CODE	DESCRIPTION	EX. VAT	INC. VAT
AC45	PS/2 K/b Adaptor	£3	£3.53
K33	BTX 104 Key Win 95 UK K/b	£10	£11.75
K36	BTX 7931 Win 95 - H/Quality	£12	£14.10
K37	BTX 2-Part W95 Ergo K/b	£27	£31.73
K20	Fujitsu 4870 Click K/b	£18	£21.15
K25	Fujitsu 4700 Click K/b	£25	£29.38
K25-95	Fujitsu 4725 Win 95	£25	£29.38
K15	Cherry Windows 95 K/b	£17	£19.98
K30	Microsoft Natural K/b	£49	£57.58
K38	BTX Wireless K/board	£35	£41.13

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VIDEO CARDS

THE GrafixStar 600

THIS MONTH'S SPECIALS

V-D15	DIAMOND STEALTH 1MB EDO 2001 PCI	£47	£55.23
V-D25	DIAMOND STEALTH 3D 2000 2MB EDO	£70	£82.25
V46C	CIRRUS LOGIC 5434 64 1MB 2MB PCI	£19	£22.33
V65	1MB DRAM Upgrade Chips	£9	£10.57

V300 MediaFORCE Virge 3D 2Mb EDO £49 EX.VAT £57.58 INC. VAT



V46-C MediaFORCE Video Excel 64Bit Accelerator



- Compatibility**
- 486SX/DX and Pentium PCI systems
 - Register compatible with EGA and VGA
 - Non-interlaced or interlaced monitor support
 - Compatible with Multi-scanning and PS/2 monitors
 - 1024x768 75Hz refresh
- Resolution & Colour Selection**
- Supports 640x480 in 16, 256, 32K, 64K and 16M colours
 - Supports 800x600 in 16, 256, 32K and 64K colours
 - Supports 1024x768 in 16 and 256 colours (I and NI)
 - Supports 1280x1024 in 16 and 256 colours interlaced
 - Supports 1600x1200 in 16 colours interlaced
- Extended Text Display**
- 80 column text modes in 30, 43, and 60 rows
 - 132 column text modes in 25, 30, 43, and 60 rows
- Software Drivers Supported**
- CLMODE • TSRFONT • Windows NT 3.1 • Windows NT 3.5 • MS Windows 3.x



£79 CODE: V96 EX. VAT



CODE	DESCRIPTION	EX.VAT	INC. VAT
V86	GrafixStar 400 1MB	£38	£44.65
V86/1	GrafixStar 400 2MB	£47	£55.23
V86/M	MPEG Star Upgrade for 400	£39	£45.83
V96	GrafixStar 600 2.25MB	£79	£92.83
V96	GrafixStar 700 2MB	£154	£180.95
V95/1	GrafixStar 700 4MB	£295	£346.63

V52 MediaFORCE Video Excel PCI Vision S3 64Bit Card



- Compatibility**
- 486SX/DX and Pentium PCI systems
 - Register compatible with EGA and VGA
 - Non-interlaced or interlaced monitor support
 - Compatible with Multi-scanning and PS/2 monitors
 - 1024x768 75Hz refresh
 - High performance DRAM based 64bit graphics engine
 - Support for India, Cinepack & software accelerated MPEG-1 video playback
- Resolution & Colour Selection**
- Supports 640x480 in 16, 256, 32K, 64K and 16M colours
 - Supports 800x600 in 16, 256, 32K and 64K colours
 - Supports 1024x768 in 16 and 256 colours (I and NI)
 - Supports 1280x1024 in 16 and 256 colours interlaced
 - Supports 1600x1200 in 16 colours interlaced
- Extended Text Display**
- 80 column text modes in 30, 43, and 60 rows
 - 132 column text modes in 25, 30, 43, and 60 rows
- Software Drivers Supported**
- SMODE • S3 REFRESH • Win 3.1 • Win 95
 - AutoCAD • 3D Studio

£27 CODE: V52 EX. VAT

- Lightning Fast Windows performance from Tseng Labs ET6000 - 128bit graphics accelerator • Free MPEG Playback Software
 - 2.25MB D-RAM (upgradable to 4.25) • 32-bit PCI local bus. Plug-n-Play compliant
 - 5 Years Manufacturers' Warranty
 - Drivers supplied include: Microsoft Windows 95, Windows 3.1 and Workgroups 3.1
 - Accelerated Video Drivers: Windows 95 Direct Draw for accelerated playback of software MPEG, Indeo, Cinepack and other AVI clips.
- Lightning Fast 128 bit Windows Acceleration

VIDEO CARDS 7

GrafixStar™	400 V86	600 V96	700 V95
Graphics Controller	S3 TRI064V+	TSENG-T6000	VISION968
Performance	95+ MILLION Wm	110+ MILLION Wm	
Memory	DRAM 1MB	2.25MDRAM	VRAM 2-4MB
Maximum Resolution	1600x1200	1600x1200	1600x1200
AVI Acceleration	Standard	Standard	Standard
Software MPEG Playback	Yes	Yes	Yes
Bus Type	PCI	PCI	PCI

BTC VIDEO CARDS



V51-M BTC 64-Bit MPEG Card 1Mb 2Mb PCI

- ARK2000MT VGA Graphic Chipset • ICS 5342 Gendec
- 1MB standard VGA memory on-board, easily upgradeable to 2MB
- Video Acceleration, Support 30 fps video playback Colour space conversion, Continuous interpolation with Pixel Scaling 800x600 24-bit, 1024x768 16-bit colour video windows

£35 EX.VAT £41.13 INC. VAT

V51 BTC 1628 64-Bit PCI VGA



- ARK2000PV VGA graphic chipset • 64-bit engine
- 32-Bit PCI Interface (PCI 2.0 fully compatible)
- 64-bit memory data path • Up to 1600 x 1200 in 256 colours
- GUI accelerator for Windows 95, 3.1X, NT and OS/2 2.X, Warp
- 1MB standard VGA memory on-board (upgrade to 2MB)
- Driver support includes: Windows 95 & 3.1X, PC CAD 6.0, Versa CAD/386 2.1, Windows NT 3.1 & 3.5, OS/2 2.X & Warp

£30 EX.VAT £35.25 INC. VAT

THE COMPLETE 3D ENTERTAINMENT & MULTIMEDIA ACCELERATOR

- 64-bit PCI graphics accelerator for the home
- Lightning fast 3D texture mapped games
- Fast and stable Windows
- High quality video playback
- Blazing DOS performance
- Includes 3D games
- 2 or 4 Mb base boards
- 2Mb board upgradeable to 4Mb

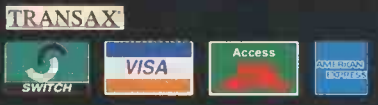


Matrox (Win 95 Compatible Plug and Play)

V125	Millenium WRAM 2Mb PCI	£105	£123.38
V125-R	Millenium Retail boxed with 3 Free Games	£117	£137.48
V126	Matrox Millenium 2Mb Upgrade	£63	£74.03
V130	Millenium WRAM 4Mb PCI with games	£150	£176.25
V130-R	4MB Millenium Retail boxed	£155	£182.13
V127	Mystique 2Mb SGRAM	£80	£94.00
V128	Mystique Retail boxed with 2 3D Games	£90	£105.75
V129	4MB Mystique Retail boxed with 2 3D Games	£125	£146.88
V131	Matrox Mystique 2Mb Upgrade	£49	£57.58

FROM: £80 CODE: V127 EX. VAT

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GUARANTEE**

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DANMERE BACKER

Voted "Best New Hardware" by PC Format customers.

High performance back-up system.

- Fast transfer speed of 9Mb/min
- High storage capacity - 1.5Gb per 3hr video tape
- Low cost storage media £1 Gb
- Easy to use back up software included
- Backs-up directly from CD-ROM and across a network



CODE	DESCRIPTION	EX. VAT	INC. VAT
T907	Danmere Backer	£34	£39.95

Seagate

TAPESTORE 800MB TRAVAN

CODE	DESCRIPTION	TAPE	EX. VAT	INC. VAT
T53	Seagate 2GB DAT		£439	£515.83
T54	Seagate 8GB DAT		£549	£645.08
T60	TAPESTORE 800 (INT)	(with free tape)	£79	£92.83
T90	TAPESTORE 3200 (INT)		£129	£151.58
T62-B	FALCON 8000 SCSI (INT)	(with free tape)	£239	£280.83
T63-E	FALCON 8000 SCSI (EXT)	(with free tape)	£289	£339.58
T64-E	FALCON 8000 EIDE (INT)	(with free tape)	£239	£280.83

Seagate

TAPESTORE TRAVAN 3200

CODE	DESCRIPTION	TAPE	EX. VAT	INC. VAT
T55	Exabyte 4200 4GB		£529	£621.58
T56	SCSI Tape Drive 500MB		£249	£292.57
T57	SCSI Tape Drive 1GB		£349	£410.07

D2 540MB REMOVABLE DRIVE



- Data transfer up to 8Mb/s
- Average seek time 10ms - as fast as a hard disk
- User friendly - standard SCSI interface
- 250,000 MTBF
- Single platter technology • Less than 8p per Mb

CODE	DESCRIPTION	EX. VAT	INC. VAT
T540-E	External 540Mb Drive (Inc. cable, software & 1 cartridge)	£229	£269.08
T540-M	540Mb Cartridge	£39	£45.83

TAPES

T46	TAPE FOR T60/80/85/65/66	£15.50	£18.22
T48	TAPE FOR T90/78-E	£24	£28.20
T48/4	TAPE FOR T62-B/63-E/64-E	£27	£31.72
T205	TAPE FOR T200-I/200-E	£17	£19.97

GENERAL TAPES AND MEDIA

CODE	DESCRIPTION	TYPE	EX. VAT	INC. VAT
T46	TR1	E	£17	£19.98
T44	8mm DAT 112m	H	£6	£7.05
T49	QW3080 4Gb	J	£19	£22.33
T47	Tape for IOMEGA 1700	J	£17	£19.98
T48	TR3	I	£24	£28.20

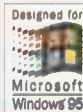
CODE	DESCRIPTION	TYPE	EX. VAT	INC. VAT
T40	Form.ted DC2120	A	£7	£8.23
T41	DC2120XL-350MB	B	£12	£14.10
T42	QIC-WIDE-420MB	C	£12	£14.10
T45	MC3000XL-700MB	D	£15	£17.63

IOMEGA DITTO EASY DRIVE

- Utilises the latest Travan technology
- Available as internal or stand alone
- 2 year manufacturer's warranty



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COLORADO MEMORY SYSTEMS INC.

COLORADO TRAVAN T1000 TAPE DRIVE

- 800Mb capacity (with compression)
- Fits into 3.5" or 5.25" drive bay
- Up to 9.5Mb/min backup speed
- Backward compatible with QIC-80 & QIC-40
- TRAVAN technology
- Includes FREE Tape



CODE	DESCRIPTION	TAPE	EX. VAT	INC. VAT
T65	Travan T1000 (INT.)		£78	£91.65
T66	Trakker T1000e Travan 800MB (EXT.)		£98	£115.15
T67	Jumbo DJ50 (inc. controller & W3.11 backup software)		£139	£163.32
T60-S	HP SureStore 2000i		£463	£544.03
T61-S	HP SureStore 2000E		£577	£677.98
T62-S	HP SureStore 5000i		£587	£689.74
T63-S	HP SureStore 5000E		£675	£793.13
T64-S	HP SureStore 6000i		£705	£828.38
T65-S	HP SureStore 6000E		£815	£957.63
T66-S	HP SureStore 12000E		£2050	£2408.75
T43	Tapes for T60S to T66S		£7	£8.23

CODE	DESCRIPTION	TAPE	EX. VAT	INC. VAT
T80	DITTO 800MB (INT)		£75	£88.12
T85	DITTO 800MB (EXT)		£93	£109.28
T78-E	EXABYTE 3.2GB (INT) TAPE STREAMER KIT		£115	£135.13
T200-I	IOMEGA 2000 (INT)		£85	£99.88
T200-E	IOMEGA 2000 (EXT)		£109	£128.08

REMOVABLES / OPTICAL DRIVES

100Mb ZIP Drive

A cost-effective medium, ideal for storage, backup and data transport. It works like a hard drive, but with the flexibility of a cartridge drive.

- Expand your hard drive without limits
- Parallel or SCSI
- Size 180 x 136 x 37mm
- 29ms seek time
- Interchangeable 100Mb Disks (200Mb with compression)



CODE	DESCRIPTION	EX. VAT	INC. VAT
T70	ZIP Drive 100MB Para.	£105	£123.38
T71	ZIP Drive 100MB SCSI	£108	£126.90
T72	100MB ZIP Disk	£10	£11.75
T76	Zip Zoom Card	£26	£30.55
T72-B	ZIP Disk 6 Pack	£49.50	£58.16

JAZ Drive

Ideal for storing, playing & transporting multimedia applications. Backup a one gigabyte hard disk in as little as 5 minutes. Simply plug the Jaz drive into a SCSI port for an instant second hard drive: one that works faster than most and has a full gigabyte of capacity. Saves up to 8 hours of CD-quality sound and 150 colour photographs, a JAZ Insider drive fits into any available 3.5" drive bay.



CODE	DESCRIPTION	EX. VAT	INC. VAT
OP26	JAZ Internal Drive 1GB SCSI	£263	£309.03
OP30	JAZ External Drive 1GB SCSI	£305	£358.38
OP35	JAZ Disk (Single)	£61	£71.68
OP35-3	JAZ Disk (3 Pack)	£178	£209.15
OP50	JAZ Jet Interface	£69	£81.07

Panasonic

CODE	DESCRIPTION	INTERFACE	EX. VAT	INC. VAT
CD200	Internal PD Drive Kit	SCSI	£290	£340.75
CD210	Internal PD Drive Kit with SCSI adaptor	SCSI	£330	£387.75
CD215	External PD Drive Kit	SCSI	£369	£433.58
CD205	650MB PD Optical Disks	N/A	£23	£27.03

Same-day despatch on all stock

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- Ideally suited for upgrading to Windows 95 or Windows NT
- Access times as low as 10ms
- Available in 1, 1.3, 1.6 and 2Gb

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Subject to Conditions.

Maxtor

Maxtor Bare Drives

		EX. VAT	INC. VAT
HD38-M	EIDE Hard Drive 1Gb	£115	£135.12
HD41-M	EIDE Hard Drive 1.3Gb	£118	£138.55
HD43-MM	EIDE Hard Drive 1.7Gb	£129	£151.58
HD44-M	EIDE Hard Drive 2Gb	£159	£186.83
HD250-M	EIDE Hard Drive 2.5Gb	£179	£210.33

Maxtor Retail Kits

		EX. VAT	INC. VAT
HD43-RM	EIDE Hard Drive 1.6Gb Kit	£157	£184.48
HD44-RM	EIDE Hard Drive 2Gb Kit	£189	£222.08
HD250-RM	EIDE Hard Drive 2.5Gb Kit	£209	£245.58

3.5" EXT PARALLEL PORT HDD

AMACOM		CAPACITY	EX VAT	INC VAT
ED38-A	EZ DISK	850MB	£247	£290.23
ED40-A	EZ DISK	1.2GB	£279	£327.83
ED43-A	EZ DISK	1.6GB	£329	£386.58
ED44-A	EZ DISK	2GB	£369	£433.58

2.5" EXT PARALLEL PORT HDD

AMACOM		CAPACITY	EX VAT	INC VAT
ED30-AD	DISKLITE	540MB	£275	£323.13
ED38-AD	DISKLITE	810MB	£335	£393.63
ED39-A	DISKLITE	1GB	£399	£468.83
ED40-AD	DISKLITE	1.2GB	£585	£687.38

2.5" HARD DISK DRIVES

ND44-T	TOSHIBA	810MB	£199	£223.83
ND46-T	TOSHIBA	1.3GB	£349	£410.08
ND47-T	TOSHIBA	1.7GB	£429	£504.08
ND48-T	TOSHIBA	2.1GB	£599	£703.83
ND44-I	IBM	810MB	£189	£222.08
ND46-I	IBM	1.2GB	£335	£393.63

3.5" EIDE HD DRIVES

SEAGATE								EX VAT	INC VAT
HD38-S	ST3850A	850MB	128k	12ms	3 YRS	£95	£111.63		
HD39-S	ST31081A	1GB	64k	14ms	3 YRS	£115	£135.13		
HD40-S	ST51270A	1.2GB	256k	12ms	3 YRS	£117	£137.48		
HD43-SS	ST31720A	1.7GB	256k	12ms	3 YRS	£132	£155.10		
HD44-S	ST32140A	2GB	128k	10ms	3 YRS	£153	£179.78		
HD56-SI	ST52520A	2.5GB	256k	11ms	3 YRS	£169	£198.58		
HD320-S	ST33240B	3.2GB	256k	11ms	3 YRS	£195	£229.13		

SCSI HARD DISK DRIVES

SEAGATE								EX VAT	INC VAT
HD55-S	ST325155N Hawk	2GB	512k	9ms	5 YRS	£349	£410.07		
HD56-S	ST32550N Barra	2.1GB	512k	8ms	5 YRS	£499	£586.33		
HD61-S	ST324371N Barra	4.3GB	512k	8.5ms	5 YRS	£725	£851.88		
HD65-S	ST410800N Elite	9GB	1MB	7.2ms	5 YRS	£1499	£1761.32		

FUJITSU								EX VAT	INC VAT
HD60-F	M2934SAV	4GB	512k	10ms	5 YRS	£579	£680.33		
HD910	M294F	9.1GB	512k	8ms	5 YRS	£1249	£1643.83		

MICROPOLIS								EX VAT	INC VAT
HD61-MS	4345NS	4.55GB	512k	7.9ms	5 YRS	£679	£797.83		
HD61-MSW	Wide	4.55GB	512k	7.9ms	5 YRS	£729	£856.58		
HD65-MS	1991	9.1GB	512k	12ms	5 YRS	£1145	£1345.38		
HD65-MS AV	1991AV	9.1GB	512k	12ms	5 YRS	£1275	£1498.13		
HD66-MS	3391NS	9.1GB	512k	7.9ms	5 YRS	£1399	£1643.83		

IBM (All AV Ready)								EX VAT	INC VAT
HD55-I	ULTRASTAR ES	2GB	512k	8.5ms	5 YRS	£259	£304.33		
HD55-IW	ULTRASTAR ES WIDE	2GB	512k	8.5ms	5 YRS	£279	£339.08		
HD60-I	ULTRASTAR XP	4.5GB	512k	8.5ms	5 YRS	£629	£739.08		
HD60-IW	ULTRASTAR XP WIDE	4.5GB	512k	8.5ms	5 YRS	£699	£821.33		

WESTERN DIGITAL



- Fast, reliable storage
- Up to 512k cache
- 3 Yrs manufacturer's warranty
- Ideally suited for upgrading to Windows 95 or Windows NT
- Access times as low as 10ms

Western Digital Bare Drives

HD38-W	EIDE Hard Drive 850Mb	£102	£119.85
HD40-W	EIDE Hard Drive 1.2Gb	£122	£143.35
HD43-W	EIDE Hard Drive 1.6Gb	£130	£152.75
HD44-W	EIDE Hard Drive 2.1Gb	£153	£179.78
HD56-W	EIDE Hard Drive 2.5Gb	£175	£205.63
HD300-W	EIDE Hard Drive 3.0Gb	£195	£229.13

Western Digital Retail Kits

HD44-RW	EIDE 2.1Gb Kit	£179	£210.33
HD300-RW	EIDE 3.0Gb Kit	£215	£252.63

Western Digital SCSI Drives

HD210-W	Ultra 2.1Gb	£409	£480.58
HD210-W	Ultra Wide 2.1Gb	£429	£504.08
HD430-W	Ultra 4.3Gb	£639	£750.83
HD430-WW	Ultra Wide 4.3Gb	£659	£774.33

HARD DISK DRIVES 9

NB: Please ensure that you have the necessary cables and fixings when purchasing bare drives as they do not come with individual drives.



Quantum has surprised the industry with its innovative approach to increasing capacity while continuing to drive down storage costs for desktop systems. The Bigfoot family of 1.2Gb, 2.1Gb and 2.5Gb drives utilise the 5.25" form factor, whilst the new Quantum Fireball series maximise the 3.5" form factor, with a SCSI option available up to 3.8Gb.

Choice Peripherals are happy to recommend the Quantum family of hard drives. Picture below is one of the Quantum Bigfoot 5.25" hard drives, a drive which PC Magazine described as "...the best part is the price: The Bigfoot undercuts the next best drive by about a dime a Mb, which adds up to giant value."



PC Magazine, June 11th 1996

Quantum™

3.5" EIDE HD DRIVES

QUANTUM	CAPACITY	CACHE	A/TIME	WARRANTY	EX VAT	INC VAT
HD38-Q	TRAILBLAZER 850MB	128k	14ms	2 YRS	£85	£99.88
HD40-Q	FIREBALL 1.2GB	128k	11ms	2 YRS	£117	£137.48
HD44-Q	FIREBALL 2.1GB	128k	11ms	2 YRS	£151	£177.43
HD48-Q	FIREBALL 3.2GB	128k	11ms	2 YRS	£171	£200.93
HD56-QT	FIREBALL 2.5GB	128k	11ms	2 YRS	£179	£210.33
HD50-Q	FIREBALL 3.8GB	128k	11ms	2 YRS	£199	£233.83

5.25" IDE HD DRIVES

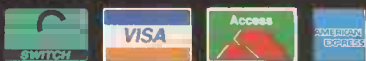
QUANTUM BIGFOOT	CAPACITY	EX VAT	INC VAT
HD40-QF	QUANTUM BIGFOOT 1.2GB	£109	£128.08
HD56-QF	QUANTUM BIGFOOT 2.5GB	£147	£172.73

SCSI HD DRIVES

QUANTUM	CAPACITY	CACHE	A/TIME	WARRANTY	EX VAT	INC VAT
HD55-Q	FIREBALL 2.1GB	128k	12ms	3 YRS	£199	£233.83
HD250-Q	FIREBALL 2.5GB	128k	12ms	3 YRS	£259	£304.33
HD320-Q	FIREBALL 3.2GB	128k	12ms	3 YRS	£249	£292.58
HD450-Q	ATLAS II 4.5GB	512k	8ms	5 YRS	£649	£762.58
HD450-QW	ATLAS II Wide 4.5GB	512k	8ms	5 YRS	£649	£762.58
HD910-Q	ATLAS II 9.1GB	512k	8ms	5 YRS	£1399	£1643.83
HD910-QW	ATLAS II Wide 9.1GB	512k	8ms	5 YRS	£1399	£1643.83

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10 MONITORS

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SMILE MONITORS

Smile CD642VL 14" FST Monitor

- 14" Non-Glare Etched
- 1280 x 768 (Non-Interlaced) Resolution
- 0.28mm Dot Pitch
- 250 x 185mm Display Size
- Scan Freq.: Horiz. 30KHz - 65KHz Vert. 50Hz - 90Hz
- Video Bandwidth: 45MHz
- VR Control
- 15 pin D-sub Connector Macintosh Quadra/PowerPC Adaptor (optional)
- MPR-II Compliant
- Analog RGB (0.7 Vp.p, 75ohm) Separate Sync, TTL Positive or Negative
- 2 Year warranty, 1st Year on site on ALL Smile monitors



SMILE
A SMILE WITH VALUE

M025 Smile 14" VGA Monitor **£159** EX.VAT **£186.83** INC. VAT

Smile CA1516SL 15" FST Monitor

- 15" Non-Glare, Flat Square Tube
- 1280 x 1024 (Non-Interlaced) Resolution
- 0.28mm Dot Pitch
- 260 x 195mm Display Size
- Scan Freq.: Horiz. 30KHz - 65KHz Vert. 50Hz - 100Hz
- Video Bandwidth: 80MHz
- Microprocessor-based control with LCD Display
- 15 pin D-sub Connector Macintosh Quadra/PowerPC Adaptor (optional)
- MPR-II Compliant • 2 Year warranty, 1st Year on site on ALL Smile monitors



SMILE
A SMILE WITH VALUE

M032 Smile 15" Colour Monitor **£229** EX.VAT **£269.08** INC. VAT

Smile CA1516CL 15" FST Monitor

- 15" Non-Glare, Flat Square Tube
- 1280 x 1024 (Non-Interlaced) Resolution
- 0.28mm Dot Pitch
- 260x 195mm Display Size
- Scan Freq.: Horiz. 30KHz - 65KHz Vert. 50Hz - 100Hz
- Video Bandwidth: 80MHz
- Microprocessor-based control with LCD Display
- Analog RGB (0.7 Vp.p, 75ohm) Separate Sync, TTL: Positive or Negative
- MPR-II Compliant
- 2 Year warranty, 1st Year on site on ALL Smile monitors



SMILE
A SMILE WITH VALUE

M041 Smile 15" VGA Monitor **£239** EX.VAT **£280.83** INC. VAT

Smile CA1716SL 17" FST Monitor

- 17" Non-Glare, Flat Square Tube
- 1280 x 1024 (Non-Interlaced) Resolution
- 0.28mm Dot Pitch
- 310 x 230mm Display Size
- Scan Freq.: Horiz. 30KHz - 65KHz Vert. 50Hz - 100Hz
- Video Bandwidth: 1000MHz
- Analog RGB (0.7 Vp.p, 75ohm) Separate Sync, TTL Positive or Negative
- Microprocessor-based control with LCD Display • MPR-II Compliant
- 2 Year warranty, 1st Year on site on ALL Smile monitors



SMILE
A SMILE WITH VALUE

M045 Smile 17" VGA Monitor **£379** EX.VAT **£445.33** INC. VAT

MEDIA FORCE

CODE	MODEL	SIZE	EX VAT	INC VAT
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SMILE				
M060	CA-2011	20"	£899	£1056.33
M062	CA-2111-FST	21"	£1099	£1291.33

VIEWSONIC Economy Series				
M027	14ES	14"	£165	£193.88
M031	15ES	15"	£255	£264.38

VIEWSONIC Graphic Series				
M033	15GS	15"	£260	£305.50
M047	17GS	17"	£465	£546.38
M065	20G	20"	£889	£1044.58

VIEWSONIC Multimedia with Built-in Speakers				
M036	15GA	15"	£322	£378.35
M048	17EA	17"	£450	£528.75
M049	17GA	17"	£520	£611.00

VIEWSONIC Professional Series				
M044	17PS	17"	£559	£656.83
M070	21PS	21"	£1180	£1386.50

TRUST MONITORS				
M017P	Precision Viewer14"		£169	£198.58
M018P	Precision Viewer15"		£239	£280.83
M048P	Precision Viewer17"		£389	£457.08
M061	CM5031	20"	£649	£762.57

IYAMA MONITORS				
M0100	MF8515	15"	£249	£292.58
M0101	MF8617E	17"	£479	£562.83
M0102	MT9017E	17"	£509	£598.08
M0103	MF8221E	21"	£925	£1086.88
M0104	MT9021E	21"	£959	£1126.83
M0105	MF8515G NEW		£229	£269.08
M0106	MT8721T NEW		£959	£1126.83

SONY MONITORS				
M077	SF2	15"	£298	£350.15
M081	GDM17SF1	17"	£505	£593.38

MediaForce 14" VFM Monitor

- 14" Tint Glare or Non-Glare
- 1024 x 768 N/A Resolution
- 252 x 180mm Display Size
- Scan Freq.: Horiz. 31.5KHz - 35.5KHz Vert. 50Hz - 90Hz
- Analog RGB (0.7 Vp.p, 75 ohm)
- 15 Pin D-sub Connector (Macintosh PowerPC Adaptor (optional))
- Power On/Off, Brightness, Contrast, H Phase, Vertical Size
- 12 Month Guarantee



MediaForce 14"
£139
EX. VAT

M0914 MediaForce 14" Monitor **£139** EX.VAT **£163.33** INC. VAT

MediaForce 15" VFM Monitor

- 15" Flat Square Tube
- 1024 x 768 (Flicker Free) N/A Resolution
- 260 x 195mm Display Size
- Scan Freq.: Horiz. 30KHz - 64KHz Vert. 50Hz - 100Hz
- Video Bandwidth: 75MHz
- Microprocessor-based control with 10 user programmable modes
- Analog RGB (0.7 Vp.p, 75ohm) Separate or composite Sync, TTL: Positive or Negative
- MPR II function optional
- 15 Pin D-sub Connector • 1 Year Guarantee



MediaForce 15"
£199
EX. VAT

M0915 MediaForce 15" Monitor **£199** EX. VAT **£233.83** INC. VAT

MediaForce 17" VFM Monitor

- 17" Flat Square Tube
- 786 x 1024 N/A Resolution
- 0.26 to 0.28mm Dot Pitch
- 360 x 270mm
- Scan Freq.: Horiz. 30KHz - 70KHz Vert. 30Hz - 66Hz
- Video Bandwidth: 30KHz to 50KHz
- 15 Pin D-sub Connector
- Analog RGB (0.7/1.0 Vp.p) H/V Separate
- Microprocessor-based control with VESA/EPA Compliance LCD Display
- Power Save Facility (with indicator)
- MPR-II Compliancy optional
- 12 Month Guarantee



MediaForce 17"
£359
EX. VAT

M0917 MediaForce 17" Monitor **£359** EX. VAT **£421.83** INC. VAT

MediaForce 20" VFM Monitor

- 20" Deflection Dark Tint, Flat Square Tube
- 1280 x 1024 N/A Resolution
- 0.26mm Dot Pitch
- 260x 195mm Display Size
- Scan Freq.: Horiz. 30KHz - 65KHz Vert. 50Hz - 100Hz
- Video Bandwidth: 80MHz
- Microprocessor-based control with LCD Display
- Analog RGB (0.7 Vp.p, 75ohm) Separate Sync, TTL: Positive or Negative • MPR-II Compliant
- 15 Pin D-sub Connector
- 12 Month Guarantee



MediaForce 20"
£729
EX. VAT

M0920 MediaForce 20" Monitor **£729** EX. VAT **£856.58** INC. VAT

Same-day despatch on all stock

PLEASE NOTE! PLEASE READ OUR "READ BEFORE YOU BUY" WARNING ON PAGE 2 PRIOR TO MAKING ANY PURCHASE.
6PM* SEE PAGE 8. ERRORS & OMISSIONS EXCEPTED.

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PRICES DIRECT

Leading brand PC components at some of the lowest prices in the UK

ADI MONITORS - ALL COME WITH 2 YEARS ON-SITE SWAP-OUT WARRANTY



ProVista 14"
£139
EX. VAT

M024 ADI ProVista 14" Colour Monitor

- 800x600 at flicker free 72Hz
- 0.28 dot pitch
- Easy to use analogue image controls
- Low radiation and power saving

ADI

£139 EX.VAT **£63.33** INC. VAT



4V 15"
£199
EX. VAT

M034 MicroScan 4V 15" Colour Monitor

- Maximum resolution 1280x1024
- 0.28 dot pitch
- Microprocessor intelligence
- Brilliant FST tube

ADI

£199 EX.VAT **£233.83** INC. VAT



ADI 5V 17"
£359
EX. VAT

M042 ADI MicroScan 5V 17" Col. Monitor

- Massive 16" FST viewable area
- 0.28 dot pitch
- Maximum resolution 1280x1024
- Microprocessor Intelligence

ADI

£359 EX.VAT **£421.83** INC. VAT



TCO 17"
£425
EX. VAT

M052 MicroScan 17 (TCO) 17" Col. Monitor

- Maximum resolution 1600x1200
- 0.26 dot pitch for sharp focus
- On-screen display and colour adjustment
- TCO emissions and power saving approval

ADI

£425 EX.VAT **£499.38** INC. VAT



ADI

M0521 ADI MicroScan 17X+ Portrait Monitor

- Maximum resolution 1280x1024
- Displays a full A4 page on the screen
- Virtually half the cost of a 21" monitor
- 0.26 dot pitch for sharp focus

17X+ 17"
£509
EX. VAT

£509 EX.VAT **£598.09** INC. VAT



DUO 17"
£415
EX. VAT

M0523 DUO Multimedia 17" Col. Monitor

- Built in stereo speakers and microphone
- Matching ADI Keyboard & mouse
- Maximum resolution 1280x1024
- 0.28 dot pitch

ADI

£415 EX.VAT **£487.63** INC. VAT

SCANNERS

MONITORS & SCANNERS 11

CODE	DESCRIPTION	SCANNER TYPE	MAX RES	EX VAT	INC VAT
TRUST SCANNERS					
SC10	Ami-Colour	Hand-held		£59	£59.33
SC20	2400SP	Flatbed	2400dpi	£209	£245.58
SC50	9600SP	Flatbed	9600dpi	£349	£410.08
SC51	4800 Compact	Flatbed	4800dpi	£239	£280.83
SC70	4800 SF	Flatbed	4800dpi	£135	£158.63
SC75	4800 SP	Flatbed	4800dpi	£159	£186.83
SC55	4800 SP SCSI I/Face	Flatbed	4800dpi	£179	£210.33
SC50	9600 SP SCSI I/Face 30Bit	Flatbed	9600dpi	£299	£351.33
SC25	Transparency Kit for 9600			£199	£233.83
SC26	Sheetfeeder Kit for 9600			£159	£186.83
EPSON SCANNERS					
SC100	Epson GTX8500 Parallel			£459	£539.33
SC105	Epson GTX8500 SCSI			£539	£633.33
SC110	Epson GTX9000 Parallel			£570	£669.75
SC115	Epson GTX9000 SCSI			£652	£766.10
SC120	Epson GT18500 SCSI			£545	£640.38
SC105	Epson GT19000 SCSI			£818	£961.15
SC140	Epson GTX5000 Parallel			£259	£304.33
SC145	Epson GTX5000 SCSI			£315	£370.13
HEWLETT PACKARD SCANNERS					
SC150	45 Grey Scale Document Scanner			£130	£152.75
SC155	Scanlet 4P			£309	£363.08
SC160	Scanjet 4C Colour Scanner			£548	£643.90
SC165	Support Pack for Scanjet 4C/4Si			£129	£151.58
SC170	Support Pack for Scanjet 4S/4P			£66	£77.55
AGER SCANNERS					
SC200	AGER 300 Scanner	Flatbed	4800dpi	£189	£222.08
SC205	AGER 610+ Scanner	Flatbed	9600dpi	£339	£398.33

SC65 Media FORCE Hand-Held Scanner

- 16.7 Million Colours
- 400dpi Resolution, up to 800dpi
- Auto-installation on both hardware and driver setting • Full TWAIN Scan (4.3") width 105mm • Scan Mode: 24-bit dither colour 256 Greyscale Black & White

M-FORCE 800dpi SCANNER
£49
EX. VAT

UMAX

Umax Vista S6E

- Optical Resolution 300x600dpi
- Maximum Resolution 4800x4800dpi
- 24-bit colour, single pass colour CCD
- Includes VistaScan, the user-friendly scanner interface
- Includes MagicMatch profiles and KodakCMS
- Bundled with Presto!, the document handling software that integrates fax, print, e-mail, OCR and filing functions

Umax Vista S12

- Optical Resolution 600x1200dpi
- Analog Gamma Design for capturing more details producing output quality superior than 30-bit scanners
- Parallel Image Processing Design for fast scanning speed
- Bundled with VistaScan, the user-friendly scanner software
- Includes MagicMatch Colour Calibration Profiles and Kodak CMS for accurate Colour from scan, display to print
- Optional Transparency Adaptor and Optional Automatic Document Feeder
- Includes Presto!, an integrated software for scan, copy, fax, e-mail, image editing and filing

UMAX SCANNERS	EX. VAT	INC. VAT
SC5-U Vista S6E	£199	£233.83
SC10-U Vista S6E LE	£224	£263.20
SC15-U Vista S6E Pro	£640	£752.00
SC20-U Vista S12LE	£424	£498.20
SC25-U Vista S12 Plus	£499	£586.33
SC30-U Vista S12 Pro	£799	£938.83
SC35-U Power Look II Pro	£1499	£1761.33
SC40-U Power Look II Pro LE	£1599	£1878.83
SC45-U Power Look II ColourPro	£1995	£2344.13
SC50-U Power Look 2000	£3295	£3871.63
INC. Binuscan Photoperfect		
SC60-U Power Look Pro	£2099	£2466.32
SC55-U Sheet feeder for S6 & S12	£349	£410.08



UMAX VISTA S6E
£199
EX. VAT



UMAX VISTA S12LE
£424
EX. VAT

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12 PRINTERS

We stock a full range of printer cartridges. If you cannot see the one you require listed on page 13 - please ring our sales telephone number, where we will be happy to quote our prices.

BROTHER PRINTERS

Brother HL-730

brother
More than just features

The new HL-730 from Brother is the low-cost solution for your printing needs combining flexible, high print quality at an affordable price. Also offers complete compatibility within various computing environments.

- 6ppm engine speed
- Straight paper path technology
- Easy to set up and use
- 200 sheet adjustable paper tray



PR271 £262 EX VAT £307.85 INC VAT

Brother HL-760

brother
More than just features

The solution to your demanding print needs combining flexible, high printing at an amazingly low price. The HL-760 offers high performance print speed with the added benefit of laser sharp 600 dpi output.

- True 1200 x 600 dpi resolution
- Enhanced memory management technology
- Network connectivity
- Sleep mode



PR272 £319 EX VAT
£374.83 INC VAT

brother
More than just features

BROTHER

PR270	HL-1260 12PPM LASER	£819	£962.33
PR271	HL-730 6PPM	£262	£307.85
PR272	HL-760 1200 x 600 dpi	£319	£374.83
PR273	11L1060	£533	£626.28

GENERAL PRINTERS

HEWLETT PACKARD INKJET PRINTERS

PR53	HP DeskJet 400 MONO	£108	£126.90
PR54	HP DeskJet 400 COLOUR	£118	£138.65
PR120	HP DeskJet 340C Portable	£136	£159.80
PR22	HP DeskJet 690C	£184	£216.20
PR47	HP DeskJet 820CXi	£229	£269.08
PR49	HP DeskJet 870CXi	£298	£350.15
PR46	HP DeskJet 1600C	£809	£950.58
PR46-M	HP DeskJet 1600CM	£1214	£1426.45
PR46-CN	HP DeskJet 1600CN + Jet Direct & 500 Sheetfeeder	£1029	£1209.08

HEWLETT PACKARD LASERJET PRINTERS

PR36	HP LaserJet 5L	£270	£317.25
PR403	HP LaserJet 6P	£459	£539.33
PR404	HP LaserJet 6MP	£619	£727.33
PR34	HP LaserJet 5	£859	£109.33
PR38	HP LaserJet 5N	£1015	£1192.63
PR39	HP LaserJet 5M	£1174	£1379.45
PR405	HP LaserJet 4V	£1269	£1491.08
PR406	HP LaserJet 4MV	£1859	£2184.33
PR40	HP LaserJet 5Si	£1975	£2320.63
PR41	HP LaserJet 5Si MX	£2219	£2607.33
PR42	HP Colour LaserJet 5	£4158	£4885.65
PR43	HP Colour LaserJet 5M	£5119	£6014.83

OKI

PR110	OKI 2010C Colour InkJet	£159	£186.83
PR205	OKI OL600ex	£239	£280.83
PR210	OKI OL610ex	£289	£339.58
PR215	OKI Page 4W Laser	£165	£193.88
PR216	OKI OL810 Laser	£409	£480.58

CANON

PR50	BJ30 Mono Portable	£130	£152.75
PR57	BJC240 BubbleJet	£139	£163.33
PR60	BJC70 Colour Portable	£142	£166.85
PR65	BJ230 BubbleJet	£233	£273.78
PR70	BJC4100 BubbleJet	£169	£198.58
PR76	BJC620 BubbleJet	£245	£287.88
PR95	BJC4550 BubbleJet	£273	£320.78
PR80	LBP 460 Laser	£185	£217.38
PR81	LBP-465 Laser Printer	£229	£269.08
PR90	BJC800	£895	£1051.63
PR91	BJ300	£343	£403.03
PR92	BJ230	£229	£269.08
PR93	BJ330	£386	£453.55
PR94	LBP1260 Laser	£719	£844.83

MINOLTA

PR19	PagePro 6 laser	£329	£386.58
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PRINTERS

Lexmark Colour Jetprinter 1020

LEXMARK
PR400

£129 EX VAT £151.58 INC VAT



LEXMARK
PR401

£205 EX VAT £240.88 INC VAT

Lexmark Colour Jetprinter 2050

Lexmark Colour Jetprinter 2070

LEXMARK
PR402

£275 EX VAT £323.13 INC VAT



EPSON PRINTERS

- Up to 720x720 dpi photo real colour
- Includes software to monitor and advise on the status of the printer, including ink level • Windows 3.1x, 95 & Mac compatible
- EPSON "Auto-Colour" function, Windows 95 ICM & Macintosh Colour Sync 2.0 Compliant
- Free PrintArtist (PC) software
- 1 year RTB warranty with optional 3 year on-site warranty
- EPSON CoverPlus 3 year extended warranty service available - £65



COLOR 500

£186 EX VAT £218.55 INC VAT

EPSON STYLUS 200

- Laser like 720 dpi printing
- Prints on plain, coated paper, envelopes & OHP transparencies
- Permanent Piezo print-head
- EPSON "Auto-Grey" function
- Status monitor inc. ink levels
- Optional 720 dpi colour upgrade
- Video & camera mode
- Windows 95 ICM compliant (When colour upgrade installed)
- 1 year RTB warranty with optional 3 year on-site warranty
- EPSON CoverPlus 3 year extended warranty service available - £40



£99 EX VAT £116.33 INC VAT



STYLUS COLOR 200

- 720 dpi photo-real colour
- Prints on plain, coated paper, envelopes & OHP transparencies • Permanent Piezo print-head • EPSON "Auto-Colour" function
- Status monitor inc. ink levels
- Video & camera mode • NEW! inks • Windows 95 ICM compliant
- 1 year RTB warranty with optional 3 year on-site warranty
- EPSON CoverPlus 3 year extended warranty service available - £40

£129 EX VAT £151.58 INC VAT

PR107	Epson Stylus 200 Mono	£99	£116.33
PR108	Epson Stylus Color 200	£129	£151.58
PR106	Epson Stylus Color 500	£186	£218.55
PR112	Epson Stylus Color 600	£225	£264.38
PR113	Epson Stylus Color 800	£309	£363.08
PR13	Epson Stylus Pro A4	£289	£339.58
PR14	Epson Stylus Pro XL A3 Color	£785	£922.38
PR15	EPL-5500W 6ppm Laser	£240	£284.35
PR120	EPL-550W 1Mb Laser	£325	£381.88
PR121	EPL-550W 2Mb Laser	£379	£445.33
PR122	EPL-550W Laser Postscript	£649	£762.58
PR123	EPLN-1200 Laser 12ppm	£689	£809.58
PR124	EPLN-1200EN Ethernet Printer	£889	£1044.58
PR125	EPLN-1200PS Postscript Printer	£1089	£1279.58
PR16	EPL-9000 8ppm A3 Laser	£1195	£1404.13
PR17	EPL-9000PS 8ppm A3 Postscript	£1475	£1733.13
PR126	EPLN-2000 20ppm Laser Printer	£1449	£1702.58
PR127	EPLN-2000PS 20ppm Postscript	£1799	£2113.83

Same-day despatch on all stock

PLEASE NOTE! PLEASE READ OUR "READ BEFORE YOU BUY" WARNING ON PAGE 2 PRIOR TO MAKING ANY PURCHASE.
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MODEMS / INTERNET

CODE	DESCRIPTION	INT/EXT	EX VAT	INC VAT
MEDIA FORCE FAX/MODEMS (NON-BABT)				
F180	14,400 Voice	INT	£39	£45.82
F185-3	33,800 Voice	INT	£49	£57.58
F170	28,800 Voice	EXT	£79	£92.83
F190	14,400	EXT	£39	£45.82
F175	28,800	EXT	£75	£88.12
F185	PCMCIA 28,800	INT/EXT	£129	£151.58
F250-V	33.6 Voice BABT approved	INT	£65	£76.38
F250-P	28.8 PCMCIA BABT approved		£109	£128.08
F255	28.8 BABT approved	EXT	£79	£92.83
TRUST FAX/MODEMS				
F66-3	33.6 BABT approved	INT	£75	£88.13
F67	33.6	EXT	£109	£128.08
MOTOROLA DATA/FAX MODEM				
F200	34,000 28.8 Ext Pro	EXT	£113	£132.78
F205	3400 Online 28.8	EXT	£119	£139.83
F206	PCMCIA		£179	£210.32
F207	ISDN		£325	£381.87
F208	PREMIER		£219	£257.32
MIRQ FAX/MODEMS				
F210	28.8 Office Connect 34	INT	£65	£76.38
LASAT FAX/MODEMS				
FL315	Flex Card combo PCMCIA	EXT	£279	£327.82
FL325	640i External ISDN	EXT	£265	£311.38
HAYES				
FH100	Internet Kit 28.8		£109	£128.08
FH200	Message Modem 28.8		£139	£163.32
FH400	Optima 28.8 Business Modem		£215	£252.62
FH500	Optima 28.8 V34 PCMCIA Fax/Data		£165	£193.87



PACE MICROLIN GOLD V34 28.8 FAX MODEM

- Unbeatable value for money
- All in one Internet
- V34 Data fax external software
- All cables, PSU, Fax & Comms software included
- UK manufactured lifetime warranty



F126 **£99** EX VAT **£116.33** INC VAT

PACE MESSAGE DESK 34 EXTERNAL 28.8 VOICE FAX MODEM

- V34 (Free upgrade to 33.6) Dual Rockwell chipset
- Fully featured data fax modem
- Automatic arbitration
- Cost effective fax back / fax forward feature
- BT telephone port (no need for splitter)
- Up to 1000 mail boxes • UK manufactured lifetime warranty



F127 **£135** EX VAT **£158.63** INC VAT

CHASSIS



D60 Series Cases

- D602 - Medium Tower
- D603 - Mini Tower
- D607 - Desktop

NEW RANGE!	DESCRIPTION	EX VAT	INC VAT
CS100	D603 Mini Tower with PSU	£49	£57.58
CS105	D607 Desktop with PSU	£49	£57.58
CS110	D602 Medium Tower with PSU	£65	£57.58



D80 Series Cases

- D803 - Mini Tower
- D807 - Desktop

Computer AWARD OF MERIT

NEW RANGE!	DESCRIPTION	EX VAT	INC VAT
CS500	D803 Mini Tower with PSU	£55	£64.62
CS501	D807 Desktop with PSU	£56	£65.80



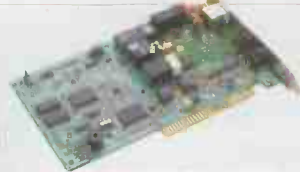
NEW! SPORTSTER FLASH 33.6

External Faxmodem with Personal Voice Mail. Download from the Internet at an amazing 56Kbps with the new Sportster Flash faxmodem - the 1st x2 ready product from USR. Nearly 100% faster than the 28.8Kbps speed currently available over ordinary telephone lines, the new Sportster Flash also provides fax, e-mail and personal voice mail facilities all in one compact unit.

Features:

- FREE upgrade to x2
- Speakerphone facility - can be used as a hands-free telephone
- Multiple voice mailboxes - up to 1000
- Call discrimination - automatically detect incoming calls and switches functions

F705-E Sportster Flash 33.6 **£151** £177.43



Sportster Winmodem

33.6 Internal Faxmodem for Windows with Personal Voice Mail

Designed exclusively for the Windows environment, Sportster Winmodem 33.6 Faxmodem provides you with Internet Access at up to 33,600bps, fax, e-mail, personal voice mail and speakerphone facilities all in one compact unit.

Features:

- Speakerphone facility - can be used as a hands-free telephone • Fax on demand
- Multiple voice mail boxes - up to 1000
- Call discrimination - automatically detect incoming calls and switches functions

F700-I Sportster Winmodem **£79** £92.83



COURIER I-MODEM V34/ISDN

Features:

- One stop analogue and ISDN capabilities
- Flash ROM (upgradeable)
- Integrated v34 + Faxmodem - x2 upgradeable
- Active Terminal Adapter
- AT Command Set Compatibility
- Asynchronous/Synchronous PPP
- Multiple rate adaptation standards
- User configurable dial security
- Plug & Play support

F710-I Courier I Modem Int **£259** £304.33
F710-E Courier I Modem Ext **£259** £304.33

CHASSIS/MODEMS 13



D70 Series Cases

- D707 - Desktop
- D702 - Midi Tower

NEW RANGE!	DESCRIPTION	EX VAT	INC VAT
CS800	D707 Desktop with PSU	£59	£69.32
CS801	D702 Midi Tower with PSU	£79	£92.82



MEDIAFORCE RANGE

- CS15 - Full Tower
- CS5 - Mini Tower
- CS10 - Desktop

DESCRIPTION	EX VAT	INC VAT
MediaForce Mini Tower & LED	£39	£45.83
MediaForce Desktop & LED	£39	£45.83
MediaForce Full Tower & LED	£59	£69.33
MediaForce Midi Tower & LED	£45	£52.88

PRINTER CARTRIDGES

CT30	Epson Black, for Stylus II, IIS, 820	£9	£10.58
CT31	Epson Colour, for Stylus II, IIS, 820	£19	£22.33
CT21	Epson Toner for EPL 5500	£49	£57.58
CT22	Epson Toner for EPL 9000	£159	£186.83
CT1	Canon BJC 4000, 4100 (black)	£4.50	£5.29
CT2	Canon BJC 4000, 4100 (colour)	£6.50	£7.64
CT16	Canon BJ200 (black)	£14.50	£17.04
CT17	Canon BJC210 (colour)	£18.50	£21.74
CT19	Canon LBP 460	£45	£52.88
CT100	HP Black 500C/540/550C/560C/400/520	£19	£22.33
CT101	HP Black 600/660	£19	£22.33
CT102	HP Black 850/1600C	£21	£24.68
CT103	HP Colour 550/560	£22	£25.85
CT104	HP Colour 660	£22	£25.85
CT105	HP Colour 850	£24	£28.20
CT150	HP Toner 5L	£37	£43.48
CT151	HP Toner 4L/4ML/4P/4MP	£30	£35.83
CT152	HP Toner 4/4M	£85	£76.38
CT153	HP Toner HP/II/III/III/III	£48	£57.58
CT40	Lexmark 1020/2050 Colour	£27	£31.73
CT41	Lexmark 1020/2050 Black	£22	£25.85
CT44	Lexmark 2070 Black	£27	£31.73
CT45	Lexmark 2070 Colour	£30	£35.25
CT46	Lexmark Optra Toner Cartridge	£41	£48.18

We stock a full range of printer cartridges. If you cannot see the one you require listed above - please ring our sales telephone number, where we will be happy to quote our prices.

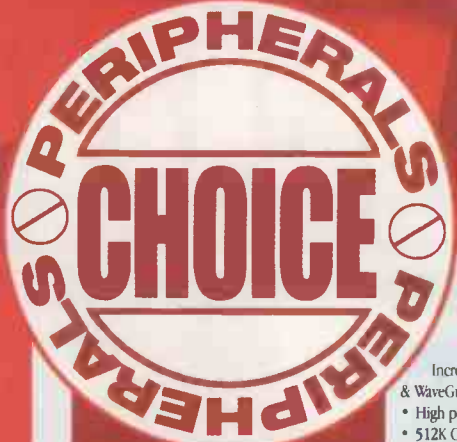
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SOUND CARDS

Creative Labs Sound Blaster AWE64 S069

Incredibly smooth, expressive & realistic audio with 64 voices of advanced WaveEffects™ & WaveGuide Synthesis.

- High performance, low noise, advanced wave-table, 16Bit CD quality record & playback
- 512K Onboard RAM with downloadable SoundFonts™ & 3D positional audio
- Bundled professional sound editing and sequencing software
- 100% Sound Blaster. Sound Blaster 16 & compatible. Pack contains:
 - Sound Blaster AWE64 card
 - Creative Midl Cable
 - RCA Audio Cable
 - Creative Software Suite for Windows 95 or Windows 3.1 / MS DOS on CD-ROM
 - Hands-free microphone



SOUND
BLASTER AWE 64
£118
EX VAT



MediaFORCE 16Bit Stereo Sound Card S037

Discover a whole new world of sound with a true 16Bit sound card which includes the following:

- 16Bit full duplex stereo sound
- Record, compress and playback voice, sound & music simultaneously
- Integrated 16Bit A/D and D/A converters
- Game port for joystick or MIDI device
- 6 Channel mixer
- Supports on-board 3D sound effects (ESS ES1868 & ES938 only)
- Software volume control for both record & playback (64 steps)
- Plug & play features
- Supports ATAPI IDE Interface



MEDIA FORCE
16BIT STEREO
£21
EX VAT

MediaFORCE Audio Excel PnP 16 S020

- ISA bus Plug and Play device support: SB16, WSS, MPU401, GAME PORT, MIXER
- Auto hardware switching mode between WSS & SB without program setting
- Support MS Windows 95 & OS/2 Warp 3
- Compatibility
 - Windows Sound System
 - Sound Blaster 16/PRO/2.0 • Wins 3.1
 - WSS mixer and SB mixer • MPU-401
 - MIDI • AdLib • Wave Table Synthesis
 - Meets & exceeds Multimedia PC I.2 Specs

- Digitized Audio
- Up to 16Bit stereo 44KHz
- Stereo Mixer
 - Mixing from CD audio, Line-in, Voice FM
 - Wavetable • Mono mixing from MIC
 - Adjustable volume FM Music Synthesizer
 - OPL 3 FM (4 operators) and up to 15 melody sounds and 5 rhythm (20 voices)
- Game Port
 - IBM PC joystick/game & ext MIDI port

- Wave Table Synthesis • MPU-401 (optional)
- MIDI Interface
 - Fully compatible with MPU-401 MIDI
 - UART mode & Sound Blaster MIDI mode
- CD-ROM Interface
- SECONDARY IDE Interface
- 3D Sound
 - Supports 3D sound U/G board (optional)
 - Software
 - Configurable I/O address, IRQ, DMA channel for all interface (jumperless)

PNP 16
SOUND CARD
£19
EX VAT



14 SOUND CARDS

BTC 1833 16-Bit Sound System

- Adlib, Sound Blaster, Sound Blaster Pro, Microsoft Windows Sound Systems
- Microsoft Windows 95
- Microsoft Windows NT • IBM OS/2
- Superior Sound
 - Real 16-bit stereo sampling
 - Programmable sample rate from 4KHz to 44.1KHz for both record and playback
 - Record, compress & playback voice, sound & music
- Advanced Synthesiser
 - High quality 20-voice stereo ESFM™ Enhanced FM music synthesiser (OPL3 compatible)
 - MPU 401 (UART mode), Sound Blaster MIDI interface for MIDI devices
 - WaveTable module upgradeable
 - Game Port • Supports 2 joysticks
- Ease Of Use
 - I/O address, IRQ and DMA channel can be set via software • Plug and play compatible



- Bundle Software:
- Audio Recorder, Audio Reminder, Audio Clip Library, Timer, Stopwatch, Volume Control, Mixer, Recording Control, Talking Clock, Talking Calculator, Chime

SUPPORTS WINDOWS 95
& OS/2 WARP 3.0



BTC 1833
£22
EX VAT

BTC 1857 16-Bit 3D Sound Card S028-3D

- Adlib, Sound Blaster, Sound Blaster Pro, Microsoft Windows Sound Systems • Microsoft Windows 95
- Microsoft Windows NT • IBM OS/2
- Superior Sound
 - Real 16-bit stereo sampling
 - Programmable sample rate from 4KHz to 44.1KHz for both record and playback
 - Record, compress, & playback voice, sound & music
- Advanced Synthesiser
 - High quality 20-voice stereo ESFM™ Enhanced FM music synthesiser • MPU 401 (UART mode), Sound Blaster MIDI interface for MIDI devices
 - Game Port • Supports 2 joysticks



Bundle Software as BTC1833

BTC 1857
£30
EX VAT



MediaFORCE 16Bit 3D Spacializer Sound Card S038

Discover a whole new world of sound with a true 16Bit sound card which includes the following:

- 16Bit full duplex stereo sound
- Record, compress and playback voice, sound & music simultaneously
- Integrated 16Bit A/D and D/A converters
- Game port for joystick or MIDI device
- 6 Channel mixer
- Supports on-board 3D sound effects (ESS ES1868 & ES938 only)
- Software volume control for both record & playback (64 steps)
- Plug & play features
- Supports ATAPI IDE Interface



MEDIA FORCE
3D SPACIALIZER
£29
EX VAT



	EX. VAT	INC. VAT	CREATIVE LABS SOUND BLASTER	EX. VAT	INC. VAT
S020 Audio Excel DSP 16 Sound Card	£19	£22.33	S052 Sound Blaster 16 PNP	£60	£70.50
S021 Audio Excel DSP 16 + Wave Table	£33	£38.78	S068 AWE 32 PnP	£75	£88.13
S027-Opti 16Bit 3D Card	£30	£35.25	S069 AWE 64 Full Edition	£118	£138.65
S028 BTC 16-Bit Sound Card	£22	£25.85	TRUST MULTIMEDIA		
S030 Trust KORG Wave Table Upgrade	£85	£99.88	S090 Video Master Game Player VGA to TV	£69	£81.08
S031 Orchid "Nu-Sound" Wave 32	£95	£111.63	S095 Video Master MPEG Player	£100	£117.50
S032 BTC 16-Bit Sound Card + Wave Table	£35	£41.13	S0130 PCTV Card with teletext / cinema modules	£235	£276.13
S02830 BTC 1857 16-Bit 3D Sound	£30	£35.25	AC90 Game Headphones	£5	£5.88
S036 Trust Sound Wave 32 3D Wave Table	£59	£69.33	AC91 Midi Headset	£5	£5.88
S0111 Pine Opti 16Bit Card	£19	£22.33	MEDIAFORCE		
S0112 Yamaha Stereo Wave Table	£14	£16.45	S037 16-Bit Soundcard	£21	£24.68
CREATIVE LABS MULTIMEDIA			S038 3D Spacializer 16-Bit Soundcard	£29	£34.08
S097 3D0 Blaster Game Player	£255	£299.63	S018 16-Bit 3D Surround Sound	£26	£30.55

Same-day despatch on all stock

PLEASE NOTE! PLEASE READ OUR "READ BEFORE YOU BUY" WARNING ON PAGE 2 PRIOR TO MAKING ANY PURCHASE.
6PM* SEE PAGE 8. ERRORS & OMISSIONS EXCEPTED.

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CD-ROM DRIVES

	I/FACE	SPEED	T/FER RATE	LOADING MECH	EX VAT	INC VAT
CD95	Microsolutions Ext	Parallel	4	600Kbs	Tray	£145 £170.38
CD903	NEC Eight Speed	IDE	8	1200Kbs	Tray	£75 £88.13
CD804	Hitachi Eight Speed	IDE	8	1200Kbs	Tray	£65 £76.38
CD906	Mirai Eight Speed	IDE	8	1200Kbs	Tray	£61 £71.68
CD807	Mitsumi Eight Speed	IDE	8	1200Kbs	Tray	£75 £76.38
CD908	Philips Eight Speed	IDE	8	1200Kbs	Tray	£75 £76.38
CD810	Panasonic Eight Speed	IDE	8	1200Kbs	Tray	£64 £75.20
CD810-S	Panasonic Eight Speed	SCSI	8	1200Kbs	Tray	£119 £139.83
CD811	Goldstar Eight Speed	IDE	8	1200Kbs	Tray	£75 £88.13
CD813	Samsung Eight Speed	IDE	8	1200Kbs	Tray	£75 £88.13
CD900	MediaFORCE Ten Speed	IDE	10	1500Kbs	Tray	£72 £84.60
CD901	Aztech Ten Speed	IDE	10	1500Kbs	Tray	£85 £99.88
CD906	BTC Ten Speed	IDE	10	1200Kbs	Tray	£79 £92.83
CD903-1	MediaFORCE Twelve Speed	IDE	12	1800Kbs	Tray	£85 £99.88
CD903	Liteon Twelve Speed	IDE	12	1800Kbs	Tray	£85 £99.88
CD904	Mitsumi Twelve Speed	IDE	12	1800Kbs	Tray	£99 £116.33
CD905	ACER Twelve Speed	IDE	12	1800Kbs	Tray	£95 £111.63
CD916	GoldStar 16 Speed Retail Kit					£89 £104.58
CD166	Pioneer CD Media				£6.50	£7.64
CD166	Kodak CD Media				£6.50	£7.64
CD80	CD Storage Tower				£15	£17.62
CD05	3 to 1 CD ROM Interface Card				£5	£5.87

CD-ROM PCMCIA - AMACOM

	EX VAT	INC VAT
CD400	EZCD Card Quad Speed CD-ROM	£195 £229.13
CD402	EZCD Card Eight Speed CD-ROM	£285 £334.88
CD403	EZCD Plus Dual Speed CD-ROM/Audio Player	£190 £223.25
CD404	EZCD Plus Quad Speed CD-RDM/Audio Player	£239 £280.83
CD405	EZCD Plus Six Speed CD-RDM/Audio Player	£255 £299.63

CD-ROM PARALLEL PORT - AMACOM

	EX VAT	INC VAT
CD300	EZCD Quad Speed	£135 £158.63
CD302	EZCD Eight Speed	£225 £264.38
CD303	EZCD Quad Speed with 16Bit Soundcard	£205 £240.88
CD305	EZCD Eight Speed with 16Bit Soundcard	£299 £358.38

SPEAKERS



Trust 3D Sound Dimension Speakers

- 300Watt powered speakers
- Ideal for multimedia



SP45 Trust 3D Sound **£49** EX. VAT **£57.58** INC. VAT

CODE MODEL OUTPUT EX VAT INC VAT

MEDIAFORCE					
SP50	Blaster 50	50W	£15	£17.62	
SP60	Blaster 160	160W	£29	£34.07	

TRUST					
SP5	Soundwave 40	15W	£14	£16.45	
SP10	Soundwave 30	25W	£19	£22.33	
SP15	Soundwave 20 (+ stands)	25W	£22	£25.85	
SP22	Soundwave 240	240W	£41	£48.18	
SP45	3D Sound Dimension	300W	£49	£57.58	
SO120	Bass Boost Box	120W	£65	£76.37	

YAMAHA					
SP24	M5 High Quality Speakers	6W	£35	£41.12	
SP27	M15 High Quality Speakers	10W	£45	£52.87	
SP28	Yamaha M20DSP 10 Watt Speakers		£49	£57.58	
SP30	MSW10 Sub Woofer System	25W	£73	£85.78	

ACTIVE					
SP23	Active	20W	£14	£16.45	
SP40	Active	80W	£25	£29.38	
SP42	Active	120W	£35	£41.13	

LABTEC SPEAKERS

SP80	LCS-1012 1.3Watts RMS Speakers		£25	£29.38	
SP81	LCS-1014 4Watts RMS Speakers		£30	£35.25	
SP82	LCS-1020 9Watts RMS Speakers		£34	£39.95	
SP83	LCS-1022 10Watts RMS Speakers		£45	£52.88	
SP84	LCS-1024 10Watts RMS Speakers & 3D Spatializer Sound		£59	£69.33	
SP85	LCS-2412 20Watts RMS Subwoofer & Speakers		£70	£82.25	
SP86	LCS-2612 20Watts RMS Subwoofer & Speakers & 3D Spatializer Sound		£85	£99.88	
SP87	LCS-3010 20Watts RMS Speakers		£65	£76.38	
SP88	LCS-3210 20Watts RMS 3D Spatializer Sound Speakers		£60	£70.50	

HP Surestore CD-Writers

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HP SureStore CD Writer 6020i:

Internal, SCSI-s drive

HP SureStore CD Writer 6020es:

External, SCSI-s drive

HP SureStore CD Writer 6020ep:

External, parallel port drive - you can now share easily with almost any PC, including laptops.



CD-ROMs 15



CDR-20	6020i	£309	£363.08
CDR-10	6020es	£359	£421.83
CDR-30	6020ep	£359	£421.83

CD-ROM WRITERS

	EX VAT	INC VAT
CD168	Plasmon CDR4240 2 x 4 Internal (bare drive kit)	£399 £468.83
CD169	Plasmon CDR4240 2 x 4 External	£490 £575.75
CD170	Plasmon CDR4400 4 x 4 Internal	£659 £774.33
CD171	Plasmon CDR4400 4 x 4 External	£720 £846.00
CD172	Plasmon CDR4240 2 x 4 Internal Full Kit	£469 £551.08
CD173	Plasmon CDR4240 2 x 4 External Full Kit	£499 £586.33
CD161-W	Yamaha CDR100 4 x 4 Internal with software	£509 £598.08
CD162	Yamaha CDE100 4 x 4 External with software	£579 £680.33

CD161-L	Neato CD Labeller Kit	£55	£64.63
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- Horizontal or vertical mounting
- Unique shell design - improved dust proofing
- Revolutionary fanless operation
- Memory buffer 512K External
- Memory buffer 2Mb Internal
- Recording speed 300Kb/sec
- MTBF 60,000 hours

CD-ROM WRITERS

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CD164	Ricoh 2 x 4 Internal Full Kit	£369 £433.58
CD167	Ricoh 2 x 4 Internal	£329 £386.58
CD 107	Low Cost SCSI Card For External Drive	£45 £52.88
AC 30	Ricoh DB 25 Centronics 50 Pin External SCSI Cable	£7 £8.23
CD167-E	Ricoh 2 x 4 External Bare Drive & software	£399 £468.83

SPEAKERS

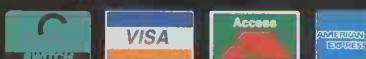
CODE	MODEL	EX VAT	INC VAT
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AIWA SPEAKERS			
SP70	TS-CD20 10Watt RMS Subwoofer & 2 x 5 Watt Speakers	£79	£92.83
SP71	SC-C77 20Watt RMS Speakers	£49	£57.58
SP72	SC-C55 10Watt RMS Speakers	£35	£41.13
SP73	SC-C47 6Watt RMS Speakers	£25	£29.38



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CASIO



Casio QV-10A

- Digital field recording
- Built-in 2Mb flash memory
- Number of images: 96
- Fixed focus with macro position
- Connection kit for PC or Macintosh

CASIO QV10A
£275
EX. VAT

Kodak ds

digital science™



Kodak DC25

- Cost-effective Digital camera for the professional or business user
- 756x504 resolution
- Number of images: 99 in compressed mode
- Focus free
- Connection kit for PC or Macintosh

KODAK DC25
£295
EX. VAT



Kodak DC50

- Increased flexibility with images and resolutions
- 756x504 resolution
- Stores 7 best or 11 better or 22 good quality images per 1Mb
- 3x auto focus zoom lens with close-up
- Connection kit for PC or Macintosh

KODAK DC50
£459
EX. VAT

	CASIO QV	KODAK DC20	DC40	DC50
STOCK CODE	DC1	DC2	DC3	DC4
RESOLUTION	320x240	495x373	756x504	756x504
FLASH	NO	NO	YES	YES
TELEPHOTO	NO	NO	NO	YES
AUTOFOCUS	NO	NO	YES	YES
IMAGES	96	8	48	7
CONNECTOR	SERIAL	SERIAL	SERIAL	SERIAL
APERTURE(f)	2.8-8	4-11	2.8-16	2.5-24
SHUTTER(s)	1/8-1/4000	1/30-1/4000	1/30-1/175	1/16-1/500
SELFTIMER	YES	NO	YES	YES
STAND MOUNT	YES	NO	YES	YES
PC/MCIA EXP'SN	NO	NO	NO	YES
POWER	4xAA	1xDL123A	4xAA	4xAA
MAINS ADAPTOR AVAILABLE	YES	NO	YES	YES
WEIGHT	190g	110g	500g	600g

	DESCRIPTION	EX VAT	INC VAT
DC1	Casio QV-10A	£275	£323.13
DC6	Casio QV-100	£419	£492.33
DC1-A	Casio QV-10A Power Adaptor	£12	£14.10
DC2	Kodak DC20	£159	£186.83
DC8	Kodak DC25	£295	£346.63
DC4	Kodak DC50	£459	£539.33
DC5	Kodak Camera Power Adaptor	£55	£64.63
DC7	Nikon Coolpix	£349	£410.08
DC9	Casio QV-300	£499	£586.33

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MICROPHONES

MS30	Desktop Microphone	£5	£5.88
MS35	"Gooseneck" M/phone	£5	£5.88
MS15	Microphone	£4	£4.70

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Bare-Bones System

Simply take 1 stylish case (supplied) and add a lightning fast Triton VX Pentium Motherboard (fitted). Make sure the case has a fitted floppy drive and hard disk tray (sorted). For individual flavouring choose your memory, CPU, hard disk drive and video card and you're ready to go!

- Stylish case
- Triton VX Pentium Motherboard
- Removable hard disk tray
- Fitted floppy disk

Total individual component price would cost
£143.00
Plus VAT

SAVE
£28.20
£119 + VAT

£119 EX VAT £139.83 INC VAT

MULTIMEDIA KITS

LOTUS POWER MultiMedia Kits

Entry level Kits

A Multimedia Kit for the High-level user.



- Kit Includes:
- Lotus SmartSuite 4 or SmartSuite 96
 - Waveable PnP Sound Card
 - 50w Power Speakers
 - Plus your choice of IDE CD-ROM Drive

Lotus

EX. VAT INC. VAT
8x £130 £152.75
10x £145 £170.38

MediaFORCE MultiMedia Kits

Entry level Kits

A Basic Multimedia Kit with everything you need to get you started in Multimedia.

- Kit Includes:
- 16 Bit PnP Sound Card
 - Power Speakers
 - Plus your choice of IDE CD-ROM Drive



EX. VAT INC. VAT
8x £85 £99.88
10x £99 £116.33
12x £109 £128.08
16x £125 £146.88

MMK25 Diamond 8 Speed Kit:
8 Speed CD-ROM, Wave 32 Opti 3DS, Sound Card, Yamaha M5 Speakers & 5 Best Selling CDs
EX. VAT £299 INC. VAT £351.33

MICE

	DESCRIPTION	EX VAT	INC VAT
M160	MS IntelliMouse	£40	£47.00
M151	Primax Venus 3 Button	£19	£22.33
M152	Primax Rainbow 3 Button	£9	£10.58
M153	Beetle Mouse - Walnut Burl	£8	£9.40
M154	Beetle Mouse - US Flag	£8	£9.40
M155	Beetle Mouse - Ladybird	£8	£9.40
M156	Whale Mouse - Walnut Burl	£9	£10.58
M157	Whale Mouse - Grey	£9	£10.58
M155-R	MediaFORCE Ergo Mouse	£10	£11.75
M110	MediaFORCE 2 Button Serial Mouse with driver software	£4	£4.70
M112	Mitsumi High Quality Serial Mouse	£7	£8.23



BEETLE - US FLAG
£8
EX. VAT

BEETLE - LADYBIRD
£8
EX. VAT

WALNUT BURL
£9
EX. VAT

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media
FORCE

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HUBS & REPEATERS		
N30	Trust 8 Port Smart Hub	£89 £104.58
N35	Trust 16 Port Smart Hub	£169 £198.58
N80	Trust 2 Port Ethernet Repeater	£104 £122.20
N81	Trust 3 Port Smart Repeater	£99 £116.33
N85	Trust 6 Port Ethernet Repeater	£179 £210.33
N105	Mini size Ethernet Hub 8Port	£79 £92.83

NETWORKING		
N103	3COM 3C509 Combo	£65 £76.37
N154	3COM 3C509 Combo 5 Pack	£310 £364.25
N20	Pocket LAN adaptor	£49 £57.58

CABLES & TOOLS, ETC		
N55	100M RG58 Coax Cable	£19 £22.33
N55-1	1M RG58 BNC Fly Lead	£4 £4.70
N55-2	2M RG58 BNC Fly Lead	£5 £5.88
N55-5	5M RG58 BNC Fly Lead	£7 £8.23
N55-10	10M RG58 BNC Fly Lead	£10 £11.75
N55-5	5M RG58 BNC Fly Lead	£7 £8.23

3COM NETWORKING PRODUCTS		
N53	3COM ETHERLINK 111 ISA 3C509B BNC	£60 £70.50
N53-5	3COM ETHERLINK 111 ISA 3C509B BNC 5 PACK	£269 £316.08
N152	3COM ETHERLINK 111 ISA 3C509B RJ45	£55 £64.63
N153	3COM ETHERLINK 111 ISA 3C509B RJ45 5 PACK	£269 £316.08
N103	3COM ETHERLINK 111 ISA 3C509B COMBO	£65 £76.38
N154	3COM ETHERLINK 111 ISA 3C509B COMBO 5 PACK	£309 £363.08
N104	3COM ETHERLINK 111 ISA 3C900 PCI COMBO CARD	£85 £99.88
N157	3COM ETHERLINK 111 PCMCIA 3C589 COMBO CARD	£95 £111.63
N158	3COM FAST ETHERLINK 10/100 PCI 3C905 COMBO	£95 £111.63
N400	3COM OFFICE CONNECT 8 PORT HUB/8TPC-1BNC	£129 £151.58
N410	3COM OFFICE CONNECT 8 PORT HUB/8TPM-1BNC+SNMP	£349 £410.08
N420	CASTELLE OFFICE CONNECT PRINT SERVER	£308 £361.90
N430	3COM S/STACK II 12 PORT HUB TP	£339 £398.33
N440	3COM S/STACK II 24 PORT HUB TP	£589 £692.08
N450	3COM S/STACK II 12 PORT HUB 100 TX	£1499 £1761.33
N460	3COM S/STACK II SWITCH 1000 12 PORT	£1849 £2172.58
N470	3COM S/STACK II SWITCH 1000 24 PORT	£2279 £2677.83

INTEL NETWORKING PRODUCTS. ALL INTEL CARDS ARE PNP/FULL DUPLEX		
N500	INTEL ETHEREXPRESS PRO 10+ ISA COMBO	£63.75 £74.91
N500-5	INTEL ETHEREXPRESS PRO 10+ ISA COMBO 5 PACK	£289 £339.58
N510	INTEL ETHEREXPRESS PRO 10+ ISA FLASH COMBO	£77 £90.48
N510-5	INTEL ETHEREXPRESS PRO 10+ ISA FLASH COMBO 5PK	£359 £421.83
N520	INTEL ETHEREXPRESS PRO 10+ ISA RJ45	£60 £70.50
N520-5	INTEL ETHEREXPRESS PRO 10+ ISA RJ45 5 PACK	£268 £314.90
N530	INTEL ETHEREXPRESS PRO 10+ ISA RJ45 FLASH	£70 £82.25
N540	INTEL ETHEREXPRESS PRO 10+ PCI COMBO	£89 £104.58
N300	INTEL ETHEREXPRESS PRO 10/100 PCI	£92 £108.10
N310	INTEL ETHEREXPRESS PRO 10/100 SMART PCI ADAPTOR	£509 £598.08
N600	INTEL NETPORT EXPRESS EL PRINT SERVER	£225 £284.38
N610	INTEL STACKABLE HUB 100 BASE TX 12 PORT	£1249 £1467.58
N615	INTEL EXPRESS 10/100 DOWNLINK	£599 £703.83
N620	INTEL EXPRESS SWITCHING HUB 5 PORTS/2 UPLINK SLOTS	£2499 £2936

BTS UPS LINE INTERACTIVE		
NB500	BTS LS600 LINE INTERACTIVE 600VA	£137 £160.98
NB900	BTS LS900 LINE INTERACTIVE 900VA	£235 £276.13
NB1000	BTS LS1000 LINE INTERACTIVE 1KVA	£279 £327.83
NB1200	BTS LS1200 LINE INTERACTIVE 1.2KVA	£329 £386.58

BTS UPS TRUE ON-LINE SYSTEMS (ALLOW 14 DAYS FOR DELIVERY)		
NE600	BTS ELAN 600 TRUE ON LINE 600VA	£439 £515.83
NE1000	BTS ELAN 1000 TRUE ON LINE 1KVA	£589 £692.08
NE1500	BTS ELAN 1500 TRUE ON LINE 1.5KVA	£785 £922.38
NE2000	BTS ELAN 2000 TRUE ON LINE 2KVA	£965 £1133.88
NE3000	BTS ELAN 3000 TRUE ON LINE 3KVA	£1695 £1991.63

CABLES & TOOLS, ETC		
N55	100M RG58 COAX CABLE	£19 £22.33
N90	UTP 1000FT CABLE-EASY PULL BOX CAT 5	£59 £69.33
N95	RJ45 Crimp Plug	£7 £8.23
N70	BNC Crimp Plug	£1 £1.18
N71	BNC T-Piece	£1 £1.18
N72	BNC In-Line Coupler	£1 £1.18
N73	BNC Terminator-50 Ohm	£1 £1.18
N90-1	UTP 1MTR Drop Connector Cable - Cat 5	£2 £2.35
N90-2	UTP 2MTR Drop Connector Cable - Cat 5	£2.50 £2.94
N91	UTP 3MTR Drop Connector Cable - Cat 5	£3 £3.53
N92	UTP 5MTR Drop Connector Cable - Cat 5	£4 £4.70
N93	UTP 7MTR Drop Connector Cable - Cat 5	£5 £5.88
N94	UTP/RJ45 Crimp Plug	£0.25 £0.29

TRUST ENERGY PROTECTOR SERIES OF SMART UPS		
N96	Energy Protector 650VA UPS	£139 £1163.33
N97	Energy Protector 1200VA UPS	£242 £284.35
N98	Energy Protector Monitor Card & Shutdown Software	£15 £17.63



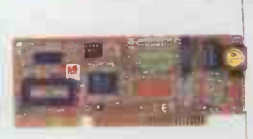
MediaFORCE - PCI Combi Card
 * Complies with PCI Bus 2.0 & later.
 * Supports Full-Duplex (20MHz) Ethernet Function.
 * Auto Adaptor Setup using Bios setup program.
 * 2 LED indicators for monitoring.
 * Auto Detect for UTP or BNC.
 * Supports 10Base-T.

N40 £29 EX. £34.08 INC.



MediaFORCE - BNC Network Card
 * 16/8 bit data transfer via ISA bus.
 * Quick diagnostic LED(ACTIVITY, LINK) 10 indicate network status.
 * 16k memory buffer.
 * Optional 8/16/32KB Boot ROM socket.
 * UMC chip.

N5 £14 EX. £16.45 INC.



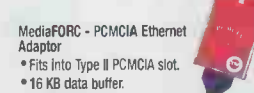
MediaFORCE - UTP Network Card
 * 16/8 bit data transfer via ISA bus.
 * Quick diagnostic LED(ACTIVITY, LINK) 10 indicate network status.
 * 16k memory buffer.
 * Optional 8/16/32KB Boot ROM socket.
 * UMC chip.

N09 £14 EX. £16.45 INC.



MediaFORCE - Combi Network Card
 * 16/8 bit data transfer via ISA bus.
 * Quick diagnostic LED(ACTIVITY, LINK) to indicate network status.
 * 16k memory buffer.
 * Optional 8/16/32KB Boot ROM socket.

N10 £16 EX. £18.80 INC.



MediaFORCE - PCMCIA Ethernet Adaptor
 * Fits into Type II PCMCIA slot.
 * 16K data buffer.
 * Media Coupler comes with 10Base-2 & 10Base-T.
 * Low power consumption.
 * Extensive driver support.
 * LED's for monitoring link & traffic conditions.

N25 £65 EX. £76.37 INC.



MediaFORCE - 4 Port Hub
 * Allows inter-connection or thin coaxial & UTP segments within a single device.
 * 5 UTP ports for twisted pair wiring 1 BNC port for thin coaxial cable.
 * LED indicators & auto port to port.
 * Complies with IEEE 820.3 10Base-T & 10Base2 standards.

N100 £49 EX. £57.58 INC.



MediaFORCE - 8 Port Hub
 * Allows inter-connection or thin coaxial & UTP segments within a single device.
 * 8 UTP ports for twisted pair wiring & 1 BNC port to thin coaxial cable.
 * LED indicators & auto port to port.
 * Complies with IEEE 820.3 10Base-T & 10Base2 standards.

N105 £59 EX. £69.32 INC.



MediaFORCE - 16 Port Hub
 * Allows inter-connection or thin coaxial & UTP segments within a single device.
 * 16 UTP ports for twisted pair wiring & 1 BNC port for thin coaxial cable.
 * LED indicators & auto port to port.
 * Complies with IEEE 820.3 10Base-T & 10Base standards.

N110 £109 EX. £128.08 INC.



MediaFORCE - PNP Combi Card
 * Complies with IEEE 802.3 10Base-2 & 10Base-T.
 * Provides an RJ-45 for twisted pair wiring & a BNC for RG-58 A/U cabling.
 * Selectable interrupts, I/O & boot ROM address.
 * Supports full Duplex.

N08 £19 EX. £22.33 INC.



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Kingston ISA & PCI Combo Cards

* QStar™ Installation Utility with Mouse Support - ready to go with just four mouse clicks
 * Supports more than 30 popular network operating systems inc. Windows, OS/2 Warp & Novell
 * Individually tested with Lifetime Warranty
 * NE2000 Compatible - guaranteed

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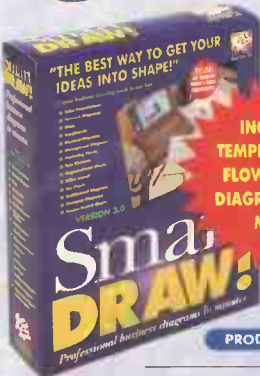
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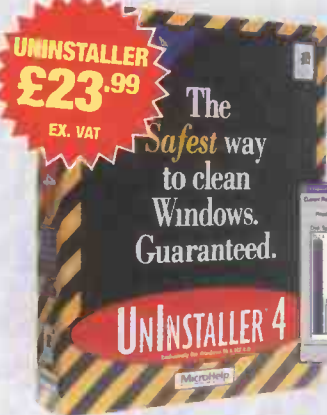


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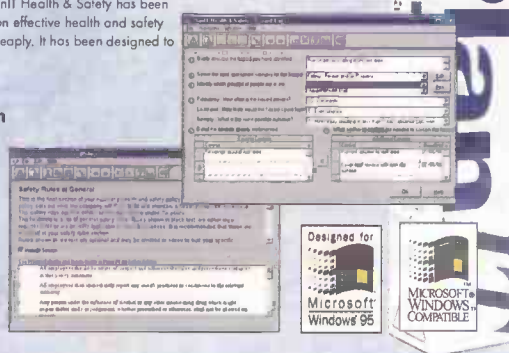
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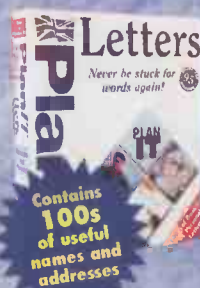
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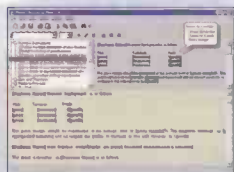
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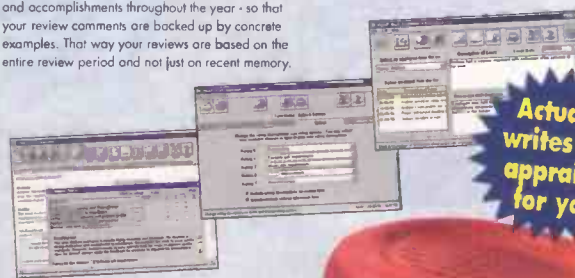
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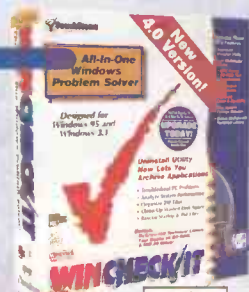
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APRIL 97
ISSUE

25 YEARS



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- TurboCAD - Full version Graphics CAD Pack.

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- MasterClips 1000 - Collection of 1000 Professional Cliparts.
- Offers valid while stocks last!!!!

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IT'S OUR 25TH ANNIVERSARY!

If you want to buy a Multimedia Notebook now is the time to do it!

Aries Multimedia Notebook now start from £1199 shattering the bounds of price and performance!

To compliment our range of personal computers we are also introducing HP, IBM and Toshiba brands.

This month we are also launching Kingston Lifetime Guaranteed proprietary memory at an incredibly low price (see page 31 for details).

Make sure you ask for our special offers and free software when placing orders.

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Both our Watford and Luton stores have free parking. It's a good idea to call the store before travelling to ensure that the goods you require are in stock. They can also be reserved for 24 hours ready for you to collect.



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Luton, LU1 1TR**

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9am	8pm
9am	6pm

Mon, Tues, Wed & Fri
Thur
Sat



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By Fax: Fax us on 01582 488588, 24 hours a day. When placing a Credit Card order, please ensure you give the name on the card, credit card number, expiry date and billing address. Delivery will be made to the billing address unless stated otherwise.



By Post: Send your order and cheque (cost of goods + delivery + 17.5% VAT) to the Luton office (address at foot of page 3). Please call Sales to confirm the delivery price and allow five working days for cheque clearance.



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Carriage Charges (inc. Insurance & packaging). Standard delivery is normally despatched within 48 hours from placing the order, subject to items being in stock, the delivery charge is based on weight, destination and number of items but is subject to a minimum of £6.95, with higher charges for outside of the UK mainland. Next Day delivery is optional for orders placed before 6pm, subject to stock availability with charges from £8.00. Saturday delivery is also available, please telephone for details and costs. Please note that in the event of late delivery, and refund will be at our discretion and subject to a minimum of the difference between the carriage actually paid and our Standard carriage cost. Claims for compensation or consequential loss will not be accepted.



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All goods supplied, except software, mice, joysticks and clearance offer items, carry a minimum of 12 months return to base warranty (unless stated otherwise). For certain products a warranty may entail dealing direct with the

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Including first year swap out



£179.95
£211.44 inc. VAT

£299.95
£352.44 inc. VAT

Aries Hi-Res Monitors

Aries 15" EnergyPro Digital Aries 17" EnergyPro Digital

- 15" diagonal flat square technology screen
- 0.28mm Dot Pitch
- Anti-glare, anti-static, anti-reflection, Invar Shadow Mask screen
- 1280 x 1024 60Hz Non-Interlace
- 1024 x 768 82Hz Non-Interlace
- Digital Controls
- Windows plug & play compliant
- Low Radiation, EPA, MPRII, CE

- 17" diagonal flat square technology screen
- 0.28mm Dot Pitch
- Anti-glare, anti-static, anti-reflection, Invar Shadow Mask screen
- 1280 x 1024 82Hz Non-Interlace
- 1024 x 768 82Hz Non-Interlace
- Digital Controls
- Windows plug & play compliant
- Low Radiation, EPA, MPRII, CE

Award Winning Videologic Graphics Cards

GrafixStar 400 2Mb 64 bit Graphics Cards

- 53 Trio64V+
- Supports 16 million Colours
- Resolution of upto 1600 x 1200
- Built-in Video Acceleration
- MPEG playback software ideal to check-out VideoCD & MPEG movies
- SmartTools for complete control
- Windows 95 Plug & Play compatible

£48
£56.40 inc. VAT



GrafixStar 600 2Mb 128 bit Graphics Card

- Tseng labs ET6000
- 128 bit graphics accelerator
- Resolution of upto 1600 x 1200 & 16 million colours
- Optimised for Windows 95 and DirectDraw
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- FREE Prolab software worth £200. Includes the Image Frollo image editor, VideoWork AVI editor and MediaScope multimedia player for video
- SmartTools for complete control



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Apocalypse 3D

- The Ultimate High performance 3D accelerator for the games user
- 4Mb of high performance SDRAM
 - Arcade-level games performance
 - Experience advance 3D realism as never before with PowerVR games titles
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£125
£146.69 inc. VAT



Special Bundle Pack

- Apocalypse 3D plus GrafixStar 600 2Mb 128 bit
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- Hauppauge PCI WinTV & GrafixStar 400 2Mb 64 bit
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The Smallest A4 Professional Flatbed Scanner at the Smallest Price!

STAR OFFER

FREE

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Xerox Textbridge OCR Software

Aries 33600 Voice Fax modem

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- V.32, V.32bis, V.22, V.22bis, V.21
- V.29 V.27 ter., T.30
- Group III, Class 1 & II Fax Compatible
- Call back Security feature
- error correction to MNP2-5 & V.42 standard
- Data compression to MNP5 and V.42bis standard
- Fully Hayes compatible
- Call progress monitor
- AutoDial and receive faxes
- Com 1 to 4 selectable
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See page 16 for further details

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- Multispin CD ROM
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- 10ms access time

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£146.69 inc. VAT

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Aries THE SIGN OF QUALITY

Aries Universa PC ^{plus} Systems

- Intel advance Triton 2 VX chipset Motherboard with an Intel Pentium® Processor
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- 850Mb Fast Hard Disk Drive
- Plug & Play support for Windows 95
- Processor upgradable to Pentium 200MHz using Type 7 ZIF Socket
- 64 bit 1Mb PCI Graphics Controller Card
- 3.5" 1.44Mb Floppy Drive
- On-board fast PCI enhanced IDE hard disk controller
- Dual 16550 UART Serial ports and an Enhanced EPP parallel port
- 4 x PCI & 3 x ISA 16bit expansion ports (One shared)
- 105 key Enhanced Windows 95 Keyboard
- MS compatible Mouse
- Desktop PC Case
- 14" EnergyStar MPRII Low Radiation, Non-Interlaced Colour Monitor (0.28mm dp)
- MS Windows 95
- SIX Year Warranty consisting of 12 months On-Site* Parts & Labour Warranty & Five years (return to base) Labour Only Warranty after 12 months



Shown with optional multimedia kit.

Optional Upgrades

US-03	16Mb to 32Mb EDO RAM Upgrade	£89
US-20	Upgrade to Aries EnergyPro 15" Micro.Controller 1280x1024 NI Monitor	£49
US-21	Upgrade to Aries EnergyPro 17" Micro.Controller 1280x1024 NI Monitor	£199
US-30	Upgrade 1 year to 3 years On-Site Maintenance	£119

LOW COST FINANCE 17.9%

Available on all Aries PCs - See example below

SPECIAL OFFER!



SEE PAGE 6



Model	Price	Finance
P5-P133	£669 (£786.08 inc VAT)	per week from £6.28
P5-P150	£689 (£809.58 inc VAT)	per week from £6.46
P5-P166	£789 (£848.18 inc VAT)	per week from £7.40
P5-P200	£935 (£1098.63 inc VAT)	per week from £8.78



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Microsoft OFFICE 97 UPGRADES £159

OFFICE 97 includes:

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- Excel 97
- Powerpoint 97
- Outlook 97

£186.83 inc. VAT



* Special price only available when purchasing an Aries PC. Software packshots for illustration purposes only.

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OFFICE PROFESSIONAL 97

- Word 97
- Excel 97
- Powerpoint 97
- Access 97
- Outlook 97

£75

£88.13 inc. VAT

Product is supplied on a CD ROM only, with on-line documentation, via voucher redemption

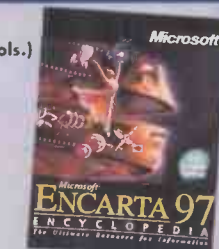
Free Bundled CD Software

Included free with Aries PC Systems

- Funk & Wagnalls New Encyclopaedia (29 vols.)
- 3D Garden Designer
- Funschool Maths
- Easy Tutor 95
- Webster's Dictionary
- Webster's English Usage Dictionary
- Webster's Dictionary of Quotations
- Webster's Biographical Dictionary
- Roget's 21st Century Thesaurus

Alternative Bundle £39*

- MS Encarta 97 UK EDITION
- Serif PagePlus HomeOffice '95
- 3D Garden Designer
- Funschool Maths
- Easy Tutor 95



* Only when purchased with an Aries Media PC system. Supplied instead of the Standard CD Bundle.

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Aries THE SIGN OF QUALITY

Aries Multimedia PC '97 System

- Intel advance Triton 2 VX chipset Motherboard
- AMD K5-PR120 Processor*
- 8Mb EDO RAM expandable to 128Mb
- 256K Pipeline Burst Cache RAM
- 1Gb Fast Hard Disk Drive
- 4X CD ROM Drive
- 16 bit Sound Blaster Compatible Sound Card
- Stereo Speakers
- Plug & Play support for Windows 95
- Processor upgradable to Pentium 200MHz using Type 7 ZIF Socket
- 64 bit 1Mb PCI Graphics Controller Card
- 3.5" 1.44Mb Floppy Drive
- On-board fast PCI enhanced IDE hard disk controller
- Dual 16550 UART Serial ports and an Enhanced EPP parallel port
- 4 x PCI & 3 x ISA 16bit expansion ports (One shared)
- 105 key Enhanced Windows 95 Keyboard
- MS compatible Mouse
- Desktop PC Case
- 14" EnergyStar MPRII Low Radiation, Non-Interlaced Colour Monitor (0.28mm dp) (Swap out warranty)
- MS Windows 95
- SIX Year Warranty consisting of: 12 months On-Site† Parts & Labour Warranty & Five years (return to base) Labour Only Warranty after 12 months

6
YEAR
WARRANTY



Design of the PC and Monitor case may vary from that shown

Model	Price	Finance
PR120*	£669 (£786.08 inc VAT)	per week from £6.28

Optional Upgrades - see below



FREE
Bundle CD
Pack
See page 4

* New processor - equal to / better performance than an Intel Pentium P120 Processor † Mainland UK only

Aries Business Media ^{plus} Series

- Intel advanced Triton 2 VX chipset Motherboard with an Intel Pentium® Processor
- 16Mb Fast EDO RAM expandable to 128Mb
- 256K Pipeline Burst Cache RAM
- 1Gb (1000Mb) Fast Hard Disk Drive
- 8X Speed CD ROM Drive
- 16 bit Sound Blaster Compatible Sound Card
- Aries 25W Hi Fi Stereo Speakers
- CD Bundle Pack (see page 4)
- Plug & Play support for Windows 95
- Processor upgradable to Pentium 200MHz using Type 7 ZIF Socket
- Videologic GrafixStar 400 64 bit PCI Graphics Card with 1Mb DRAM
- 3.5" 1.44Mb Floppy Drive
- On-board fast PCI Enhanced IDE HD controller
- Dual 16550 UART Serial ports and an Enhanced EPP parallel port
- 4 x PCI & 3 x ISA 16bit expansion ports (One shared)
- 105 key enhanced Windows 95 Keyboard
- MS compatible Mouse
- Desktop PC Case
- 14" EnergyStar MPRII Low Radiation, Non Interlaced Colour Monitor (0.28mm dp) (Swap out warranty)
- MS Windows 95
- SIX Year Warranty consisting of: 12 months On-Site* Parts & Labour Warranty Five years (return to base) Labour Only Warranty after 12 months.

Aries Business Media ^{plus} systems make no compromise on quality or performance while continuing Aries reputation for superb value. With Pentium processors up to 200MHz ensuring stunning speeds, an EIGHT speed multimedia kit and Videologic 64-bit graphics you really can't buy better.

Optional Upgrades

BM-03	16Mb to 32Mb EDO RAM Upgrade	£89
BM-20	Upgrade to Aries EnergyPro 15" Micro.Controller 1280x1024 NI Monitor	£49
BM-21	Upgrade to Aries EnergyPro 17" Micro.Controller 1280x1024 NI Monitor	£199
BM-30	Upgrade 1 year to 3 years On-Site Maintenance	£119

Model	Price	Finance
P5-P133	£669 (£786.08 inc VAT)	per week from £6.28
P5-P150	£689 (£809.58 inc VAT)	per week from £6.46
P5-P166	£1195 (£1404.13 inc VAT)	per week from £11.21
P5-P200	£1341 (£1575.68 inc VAT)	per week from £12.58
P5-P166MMX	£969 (£1098.63 inc VAT)	per week from £9.09
P5-P200MMX	£1115 (£1310.13 inc VAT)	per week from £10.46

6
YEAR
WARRANTY

Videologic
1Mb

INTEL
TRITON
CHIPSET

8X
SPEED
CD

256K
Cache

64 BIT
GRAPHICS

PLUG
PLAY

16Mb
EDO RAM

Microsoft
Windows 95

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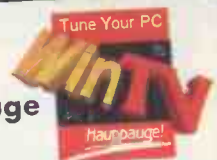
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Aries



Turn your PC into a 24 hour information centre with a Hauppauge WIN/TV PCI Card



£79.95

£93.94 inc VAT

with any Aries PC

Aries Professional Media ^{plus} Series



6 YEAR WARRANTY

THE ULTIMATE PERFORMERS

Looking for the fastest PCs around? The search is over. The Aries Professional Media systems have arrived. Fast. Powerful. Built to run your toughest applications at staggering speeds and designed for the increasingly strenuous demands of today's business PC user. Professional Media systems feature the latest Intel Triton chipset designed to get the ultimate performance from the Pentium processor. Combine this with 32Mb of high speed EDO-RAM and Pipeline Burst Cache and you have a system that is probably the finest example of Power Computing available anywhere.

Model	Price	Finance
P5-P133	£1075 (£1263.13 inc VAT)	per week from £10.50
P5-P150	£1095 (£1286.63 inc VAT)	per week from £10.27
P5-P166	£1195 (£1404.13 inc VAT)	per week from £11.21
P5-P200	£1341 (£1575.68 inc VAT)	per week from £12.58
P5-P166MMX	£1245 (£1462.88 inc VAT)	per week from £11.68
P5-P200MMX	£1391 (£1634.43 inc VAT)	per week from £13.05

- Intel advanced Triton 2 VX chipset Motherboard with an Intel Pentium® Processor
- 32Mb EDO RAM expandable to 128Mb
- 256K Pipeline Burst Cache RAM
- 1.6Gb (1,600Mb) Fast Hard Disk Drive
- Aries V34 33,600 baud external Internet Voice Fax/Modem Solution
- TEN Speed CD ROM Drive
- Aries 3D 16 bit Sound Card
- Aries 80W Digital Plus Stereo Speakers*
- CD Bundle Pack (see page 4)
- Plug & Play support for Windows 95
- Processor upgradable to Pentium 200MHz using Type 7 ZIF Socket
- VideoLogic GrafixStar 600 128 bit PCI Graphics Card with 2Mb MDRAM

- 3.5" 1.44Mb Floppy Drive
- On-board fast PCI Enhanced IDE hard disk controller
- Dual 16550 UART Serial ports and an Enhanced EPP parallel port
- 4 x PCI & 3 x ISA 16bit expansion ports (One shared)
- 105 key enhanced Windows 95 Keyboard
- MS compatible Mouse
- Midi Tower PC Case
- 15" EnergyStar MPRII Low Radiation, Non-Interlaced Colour Monitor (0.28mm dp) (First year swap out warranty)
- MS Windows 95
- SIX Year Warranty consisting of: 12 months On-Site** Parts & Labour Warranty Five years (return to base) Labour Only Warranty after 12 months.

Optional Upgrades

PM-03	32Mb to 64Mb EDO RAM Upgrade	£149
PM-06	Upgrade to 2Gb IDE HDD	£49
PM-30	Upgrade 1 year to 3 years On-Site Maintenance	£135

If you require any other upgrade not shown here, please ask



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*Speaker casing may differ from that shown

**UK Mainland only

Monitor Options* - upgrade now and save £££'s

	Aries 15" EnergyPro Digital	Aries 17" EnergyPro Digital	Aries 8000S 17" EnergyPro+	Panasonic PanaSync 4 TX-T	Panasonic PanaSync 5G 1734U
Screen Size	15"	17"	17"	15" Flat Screen	17"
Dot-Pitch	0.28mm	0.28mm	0.26mm	0.27mm	0.27mm
Resolution Non-Interlace	1024 x 768 92Hz 1280 x 1024 60Hz	1024 x 768 82Hz 1280 x 1024 60Hz	1024 x 768 105Hz 1280 x 1024 82Hz 1600 x 1200 70Hz	1280 x 1024 Max	1024 x 768 79Hz 1280 x 1024 84Hz
Frequencies Horz. Vert.	30 to 65KHz 50 to 120Hz	30 to 65KHz 50 to 120Hz	30 to 85KHz 50 to 120Hz	Horz. 30 to 69KHz Vert. 50 to 160Hz	
Other Features	Digital Controls Low Radiation MPRII/CE	Digital Controls Low Radiation MPRII/CE	Digital Controls Low Radiation MPRII/CE/EPA	Digital Controls Low Radiation MPRII	Digital Controls Low Radiation MPRII/CE/TCO
Upgrade from 14" Aries Monitor	£49 £57.58 inc. VAT	£199 £233.83 inc. VAT	£269 £316.08 inc. VAT	£99 £116.33 inc. VAT	£279 £327.83 inc. VAT
Upgrade from 15" Aries Monitor	—	£149 £175.08 inc. VAT	£219 £257.33 inc. VAT	£49 £57.58 inc. VAT	£229 £269.08 inc. VAT

*Upgrade prices only available at time of Aries PC purchase

APR **17.9%** Finance calculation example: Cash Price: £1249 + VAT = £1467.58 Deposit: 10% £146.76 and 24 equal payments of £65.09 Total Price: £1708.82 Finance is available subject to status. Be sure you can afford the payments prior to entering into an agreement. Price excludes carriage.

For ordering information, please see page 2



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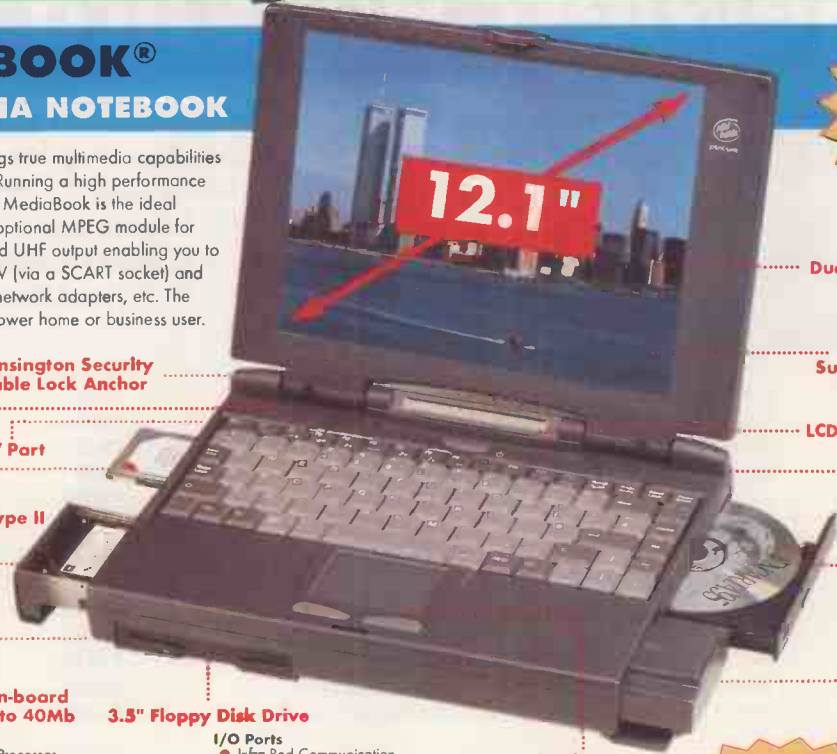
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Aries MULTIMEDIA NOTEBOOK



MEDIABOOK® MULTIMEDIA NOTEBOOK

The Aries MediaBook brings true multimedia capabilities to the notebook platform. Running a high performance Intel Pentium® processor, a MediaBook is the ideal presentation tool, with an optional MPEG module for video playback, a standard UHF output enabling you to display on any standard TV (via a SCART socket) and PCMCIA slots for adding network adapters, etc. The ultimate portable for the power home or business user.



UPGRADE TO 16MB FOR £39
this month only

- Built-in Stereo Speakers**
- Kensington Security Cable Lock Anchor**
- TV Part**
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- 810Mb Removable Hard Disk Drive**
- 8Mb RAM on-board expandable to 40Mb**
- 3.5" Floppy Disk Drive**

- Dual Scan or Active Matrix TFT LCD Screen**
- 800 x 600 Super VGA 256 Colour Display with 2Mb of Video RAM**
- LCD Status Display**
- Infra Red Communication Port - IrDA standard**
- 8X Eight Speed CD ROM**
- NIMH Removable Battery**

- Processor**
- Intel Low Powered Pentium Processor
 - Intel Pentium Processors upgradable to 150MHz using ZIF socket
- Memory**
- 8Mb RAM on-board expandable to 40Mb
 - 256K Level 2 Write-Back Cache, Pipeline Burst SRAM

- Storage**
- 810Mb Removable Hard Disk Drive
 - 1.44Mb 3.5" Floppy Drive

- Multimedia - CD ROM Drive/Sound System**
- 8X Speed CD ROM Drive
 - 16 bit Stereo Sound System
 - Sound Blaster, Sound Blaster Pro and MS Sound System for Windows compatible
 - Built-in Microphone
 - Built-in Stereo Speakers

- Display/Video System**
- 11.3" Super VGA 800 x 600 - 256 Colours Dual Scan DSTN or Active Matrix TFT LCD Screen
 - Supports up to 1024 x 768 - 256 Colours mode on external monitor
 - Simultaneous display of both screen & external video
 - Windows GUI accelerator
 - Full power management
 - PCI Bus Colour Graphics Interface with 2Mb Video RAM
 - Optional Software MPEG drivers

- Pointing Device/Keyboard**
- Latest technology TouchPad with ALPS drivers
 - Both external PS/2 mouse (optional) and integral TouchPad can work concurrently
 - Windows 95 86 Key Keyboard

- Warranty**
- THREE Year Warranty consisting of: 12 months* Parts & Labour Return to Base & 2 years Return to Base Labour only* Warranty * Mainland UK only

- I/O Ports**
- Infra Red Communication Port - IrDA standard
 - Built-in TV Part
 - MIDI/Game Port
 - PCMCIA Slot - 2 x Type II OR 1 x Type II and 1 x Type III
 - 16550 UART Hi-Speed Serial Port
 - EPP/ECP Hi-Speed Parallel Port
 - External auto-sensed PS/2 keyboard/mouse port
 - Jacks for Stereo Line In/Line Out & Ext. Microphone

- Power Management**
- Multiple-mode power management scheme
 - APM 1.1 support
 - Static Suspend
 - Suspend to HDD
 - Modem ring and any key triggered resume
 - Battery gas gauge support
 - Suspend or warning on low battery

- Security**
- Kensington Security Cable Lock Anchor
 - MASTER Password support
 - Password protection for Set-Up entry screen

- Notebooks Supplied with:**
- Microsoft Windows 95 (with manual/CD)
 - Optional MS DOS v6.22/Windows v3.11 (FREE)
 - Optional MS NT Workstation upgrade (£99 +VAT)
 - Carrying case
 - AC/DC Adaptor

- Weight & Dimensions**
- 3.2Kg/7lbs approx
 - 299(w) x 230(d) x 56(h)mm

Latest technology TouchPad with ALPS drivers



LOW COST finance only 17.9% APR



Aries PCMCIA V34 33,600 Baud

PCMCIA Fax/Modem with SuperFax Software. BABT Approved **£99**



Insure your Notebook from as little as £1.25 per week
See page 4 for details

OPTIONS & UPGRADES

8 to 16Mb RAM Upg.	£99
8 to 24Mb RAM Upg.	£189
8 to 40Mb RAM Upg.	£299
Upgrade to 1Gb HD	£39
Upgrade to 1.35Gb HD	£89
Upgrade to 1.8Gb HD	£139
Upgrade to 2.1Gb HD	POA
Spare Battery Pack	£89
Additional Power Adaptor	£58
15W External Speakers	£25
Car Lighter Adaptor	£39
Seculock - Kensington Lock System	£35

The Intel® logo and Pentium® are registered trademarks of Intel Corporation

Description	8Mb RAM 810Mb Hard Disk		MediaBook753 - 120 Power Saving Intel 120MHz Pentium™ Processor		MediaBook753 - 133 Power Saving Intel 133MHz Pentium™ Processor		MediaBook753 - 150 Power Saving Intel 150MHz Pentium™ Processor		
	Price	Finance per week from	Price	Finance per week from	Price	Finance per week from	Price	Finance per week from	
Dual Scan Colour 11.3" Display	£1199	£1408.83 inc.VAT	£11.25	£1229	£1444.08 inc.VAT	£11.53	£1279	£1502.83 inc.VAT	£12.00
TFT Active Matrix Colour 11.3" Display	£1395	£1639.13 inc.VAT	£13.09	£1425	£1674.38 inc.VAT	£13.36	£1475	£1733.13 inc.VAT	£13.84
TFT Active Matrix Colour 12.1" Display	£1595	£1874.13 inc.VAT	£14.96	£1625	£1909.38 inc.VAT	£15.24	£1675	£1968.13 inc.VAT	£15.72

17.9% APR Finance calculation example: Cash Price: £1299 + VAT = £1467.58 Deposit: 10% £146.76 and 36 equal payments of £46.87 Total Price: £1834.08 Finance is available subject to status. Be sure you can afford the payments prior to entering into an agreement. Price excludes carriage.

For ordering information, please see page 2



Watford Electronics Ltd SALES HOTLINE: 01582 745555

Order by 5pm for Next Day Delivery **FAX: 01582 488588**



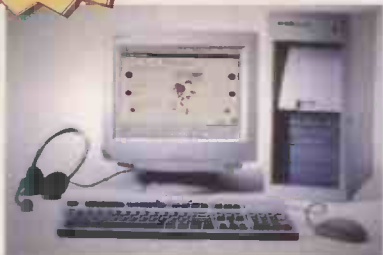
Prices exclude carriage & VAT @ 17.5% except where shown

Mail Order & Showroom. Jesso House, Finway, off Dallow Rd, Luton LU1 1TR Showroom only: 250 Lower High Street, Watford, WD1 2AN. Tel: 01923 237774

QUALITY WITHOUT COMPROMISE

**DON'T FORGET
TO ASK FOR YOUR
FREE CD SOFTWARE
WHEN ORDERING**

Hewlett Packard



Hewlett Packard are famous for their undoubted quality and we are pleased to offer a full range of desktop Pc's. When you buy HP you are buying excellence in 'After Sales' and 'Technical Support' peace of mind! If you are interested in buying any of the HP range (including network servers) whether it is listed below or not please contact our PC specialist on **01582 745555** and don't forget to ask about the Support Packs!

HP DP#	Description	Price	Inc. VAT
D4552A	Vectra VL 5/133 Model 1.6Gb (8Mb)	£765	£898.88
D4553A	Vectra VL 5/133 Model 1.6Gb (16Mb)	£819	£962.33
D4554A	Vectra VL 5/133 Model 1.6Gb (16Mb) +10 Base-T	£849	£997.58
D4566N	Vectra VL 5/133 Model 1.6Gb (32Mb) 8x-CD + NT4	£1089	£1279.58
D4555A	Vectra VL 5/133 Model 2.5Gb (16Mb)	£875	£1028.13
D4557A	Vectra VL 5/166 Model 1.6Gb (16Mb)	£969	£1138.58
D4567N	Vectra VL 5/166 Model 1.6Gb (32Mb) 8x-CD + NT4	£1049	£1232.58
D4559A	Vectra VL 5/166 Model 2.5Gb (16Mb)	£1029	£1209.08
D4558A	Vectra VL 5/166 Model 1.6Gb (16Mb) +10 Base-T	£999	£1173.83
D4560A	Vectra VL 5/166 Model 2.5Gb (16Mb) 8x-CD + Audio	£1185	£1392.38
D4562A	Vectra VL 5/200 Model 2.5Gb (16Mb) +10 Base-T	£1299	£1526.33
D4563A	Vectra VL 5/200 Model 2.5Gb (32Mb) 8x-CD + Audio	£1499	£1761.33
D2613A	HP 14" Ergo 1024 Monitor	£239	£280.83
D2808A	HP 15" Ergo Super VGA Monitor	£229	£269.08
D2818A	HP 17" Ultra Monitor	£475	£558.13
D2845A	HP 21" Ultra VGA Monitor	£1249	£1467.58

TOSHIBA NOTEBOOKS

Satellite Series

1. 110 CS/810 11.3" STN
2. 200 COS/810 11.3" STN
3. 110 CT/810 11.3" TFT
4. 200 CDT/810 11.3" TFT

1. **£1015** £1192.63 Inc. VAT
2. **£1270** £1492.25 Inc. VAT
3. **£1355** £1592.13 Inc. VAT
4. **£1780** £2091.50 Inc. VAT



Satellite Pro

1. 430 CDS/1350 11.3" STN
2. 430 CDT/1350 11.3" TFT

1. **£1695** £1991.63 Inc. VAT
2. **£2295** £2696.62 Inc. VAT

**Insurance cover
from as little as
£1.25 per day
Call 01582 745555
for details**



Tecra 500 Series

1. 500 CS/1350 12.1" STN
2. 510 CS/1350 12.1" STN
3. 500 CDT/1350 12.1" TFT
4. 510 CDT/2168 12.1" TFT

1. **£1695** £1991.63 Inc. VAT
2. **£2290** £2690.75 Inc. VAT
3. **£2545** £2990.38 Inc. VAT
4. **£3055** £3589.63 Inc. VAT



Tecra 730 CDT

1. 730 CDT/2000 150MHz
 2. 730 XCDT/2000 150MHz
1. **£3820** £4488.50 Inc. VAT
 2. **£3995** £4694.13 Inc. VAT

Portégé Series

1. 660 CDT 11.3" TFT
1. **£1695** £1991.63 Inc. VAT



QUALITY WITHOUT COMPROMISE

Some dreams do come true... with IBM

Exclusive IBM offers!



IBM the most famous name in PC's are partnering Watford Electronics to sell their ThinkPad family. ThinkPads are renowned for their uncompromising quality and portability. We are fortunate to be able to offer our customers exceptional pricing and recommend that you contact our PC Specialist on 01582 745555 to ensure you get great service and support!

365 X

- P120
- 8Mb RAM
- 810Mb Hard Disk Drive
- Internal 3.5" Disk Drive
- 10.4" TFT Screen
- NIMH Battery Pack
- Windows '95

£1,395
£1,639.13 inc. VAT

STAR BUY!
SAVE OVER
£787

365 X

- P120
- 8Mb RAM
- 1.08GB
- 3.5" Disk Drive
- 11.3" DSTN Screen
- NIMH Battery Pack
- Windows '95

£1,625
£1,909.38 inc. VAT

All IBM PC models offer 'HelpWare' - on-line support services and a 24-hour helpline (1st year free).

365 XD

- P120
- 8Mb RAM
- 810Mb
- 4 x CD ROM
- 10.4" TFT Screen
- NIMH Battery Pack
- Windows '95

£1,799
£2,113.83 inc. VAT

NEW 1997 PRICES

365 XD

- P120
- 8Mb RAM
- 1.08Gb Hard Disk
- 11.3" DSTN Screen
- NIMH Battery Pack
- 4 x CD ROM
- Windows '95

£1,619
£1,902.33 inc. VAT

All IBM PC models offer 'HelpWare' - on-line support services and a 24-hour helpline (1st year free).

365 XD

- P133
- 8Mb RAM
- 1.35Gb Hard Disk
- 11.3" TFT Screen
- NIMH Battery Pack
- 6 x CD ROM
- Windows '95

£2,645
£3,107.88 inc. VAT

UNBEATABLE VALUE

760 EL

- P120
- 8Mb RAM
- 1.35Gb Hard Disk
- 11.3" Dual Scan Screen
- Li-Ion Battery
- 3.5" disk Drive
- Windows '95

£1,999
£2,348.83 inc. VAT

All IBM PC models offer 'HelpWare' - on-line support services and a 24-hour helpline (1st year free).

760 EL

- P133
- 16Mb RAM
- 2.1Gb Hard Disk Drive
- 12.1" TFT Screen
- Li-Ion Battery
- 3.5" Disk Drive
- Windows '95

£3,319
£3,899.83 inc. VAT

BEST BUY

760 ED

- P133
- 16Mb RAM
- 2.1Gb Hard Disk Drive
- 12.1" XGA TFT Screen
- Li-Ion Battery
- 6 x CD Rom
- Windows '95

£3,965
£4,658.88 inc. VAT

All IBM PC models offer 'HelpWare' - on-line support services and a 24-hour helpline (1st year free).

760 E

- P150
- 16Mb RAM
- 2.1Gb Hard Disk Drive
- 12.1" XGA TFT Screen
- Li-Ion Battery
- 3.5" Disk Drive
- Windows '95

£3,745
£4,400.38 inc. VAT

QUALITY ASSURED

All ThinkPads include Lotus SmartSuite Software

To make your dreams come true, call the PC Specialists on:

01582 745555



Don't forget to ask for Complete Computer Cover - To find out more call **01582 745555**

For ordering information, please see page 2

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AMAZING

Networking Offers

DON'T FORGET TO ASK FOR YOUR FREE FRONTIER E-MAIL SOFTWARE WITH ANY HUB/REPEATER OR LAN PURCHASED

GENIUS ETHERNET PRODUCTS

GE2000 III Ethernet Adapter

The GE2000 III is a 16-bit Ethernet card which is 100% Novell NE2000 compatible. Installation is simple - just plug in and run the easy to use setup software.

- BNC and UTP connections (AUI optional)
- 35% faster than Novell NE2000 card
- Supports NetWare, WFWG & TCP/IP

Single: £20 5 pack: £96



Personal NetWare & GE2000 Card
Genius GE2000 III Ethernet card and Novell Personal NetWare software
SPECIAL OFFER PRICE £42

£47
(£55.23 inc VAT)



GE2500+ PCI Ethernet Adapter

The GE2500+ is a new high performance Ethernet adapter for use in PCI based computers. Uses bus mastering for low CPU & Bus utilization, thus improving overall performance.

- BNC and UTP connections (AUI option)
- Software configurable & auto media detect
- Supports NetWare, WFWG, PCNFS & TCP/IP

Single: £35 5 pack: £166

£79
(£92.83 inc VAT)



GF100TX Fast Ethernet Card

Increase the performance of your network with the Genius GF100TX Fast Ethernet card. Offering both 10Mbps and 100Mbps speeds, you can use it on an existing LAN, and upgrade later.

- 10/100 Mbps speeds
- PCI Local Bus Interface
- RJ45 connection
- Supports NetWare, NFWG, NT & TCP/IP

Single: £79 5 pack: £389

Top quality products from Genius' No. 1 UK supplier

ETHERNET CABLING

Length	1m	3m	5m	10m	15m	20m	30m	50m	100m	300m
Thin Ethernet	£3	£5	£6	£9	£12	£15	£22	£27	£32	£115
UTP	£3	£6	£9	£11	£13	£16	£19	£27	£32	£122

UPS SYSTEMS

APC BackUPS Pro (with Powerchute)

BK280i: PnP -	280VA	£105
BK420i: PnP -	420VA	£155
BK650i: PnP -	650VA	£187

APC SmartUPS

SU450i -	450VA	£213
SU700i -	700VA	£225
SU1000i -	1.0kVA	£355
SU1400i -	1.4kVA	£466
SU2200i -	2.2kVA	£830

APC SmartUPS (with Powerchute)

SU700INET -	700VA	£239
SU1000INET -	1.0kVA	£349
SU1400INET -	1.4kVA	£479

APC SmartUPS Value Server

SUVS650i -	650VA	£199
SUVS1000i -	1.0kVA	£339
SUVS1400i -	1.4kVA	£449



E3000 II Parallel Port Adapter

The E3000 II is a parallel port Ethernet adapter offering higher performance than any similar priced model available.

- BNC and UTP connections as standard
- Through connection for local printer
- Simultaneous printer & LAN connectivity
- PS/2 mouse port power lead or mains PSU

Single: £47 5 pack: £227

ME3000 II PCMCIA Ethernet Card

A high performance Ethernet adapter for use in notebooks with a PCMCIA slot. Has both BNC and UTP connections.

SPECIAL OFFER - Single £63 5 Pack £304



£35
(£41.13 inc VAT)

GH4080/GH4160 Ethernet Hubs

The GH4080 and GH4160 are compact, stylish UTP Ethernet hubs, providing either 8 or 16 ports. The units are ideal for small to medium size workgroup applications.

- 8 or 16 UTP ports, 1x BNC connection
- Compact size and very lightweight
- Daisy chain port for stacking hubs together
- LED indicators display port status

GH4080: £79 GH4160: £119



£79
(£102.23 inc VAT)

NOVELL NETWORK

No of Users	5	10	25	50	100	250	Manuals
NetWare 3.12	£475	£1075	£1679	£2140	£3129	£5560	£189
NetWare 4.1 CD	£475	£929	£1649	£2249	£3132	£5539	£165

Education and Upgrade Packs available - call 01582 745555 for details

AMAZING NETWORKING OFFERS

10Mbps Ethernet Adapters

3Com		
Etherlink III 3C509B-TP ISA	£65	
Etherlink III 3C509B-Combo ISA	£73	
Etherlink III 3C592-Combo EISA	£135	
Etherlink III 3C589C-TP PCMCIA	£95	
Etherlink III 3C589C-Combo PCMCIA	£114	
Etherlink XL 3C900-Combo PCI	£85	

Dlink		
DE220CT Combo ISA	£45	
DE620CT Combo Parallel Port	£89	
DE650CT Combo PCMCIA	£75	

Genius LAN		
GE2000 III Combo ISA	£20	
GE2500 II Combo Parallel Port	£35	
E3000 II Combo Parallel Port	£47	
ME3000 II Combo PCMCIA	£63	

Intel		
EtherExpress Pro 10+ Combo ISA	£69	
EtherExpress Pro 10+ Combo ISA 5pk	£335	
EtherExpress 32 Flash Combo EISA	£149	

Novell		
NE2000+ BNC ISA	£48	
NE2000+ TP ISA	£48	
NE4100 TP PCMCIA	£149	

SMC		
Elite 16 Ultra BNC ISA	£55	
Elite 16C Ultra Combo ISA	£62	
EtherEZ Combo ISA	£63	
EtherPower PCI Combo PCI	£69	
ElitePort Combo Parallel Port	£139	

Network Operating Systems

MS Windows NT		
Windows NT v4.0 Server + 5 Client Licence	£559	
Windows NT v4.0 Server + 10 Client Licence	£769	

SCO Unix		
SCO OpenServer v5.0.2 Host 5 User (Multiuser system without LAN support)	£379	

SCO OpenServer v5.0.2 Enterprise 5 User (Multiuser system with LAN support)	£699	
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SCO OpenServer v5.0.2 Desktop (Single user only)	£429	
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SCO OpenServer v5.0.2 Development System (Development Tools/C++ compiler add-on)	£429	
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SCO OpenServer v5.0.2 10 User Licence (Licence for Multiprocessor systems)	£549	
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SCO OpenServer v5.0.2 10 User Licence	£269	
SCO OpenServer v5.0.2 25 User Licence	£549	
SCO OpenServer v5.0.2 100 User Licence	£1,649	

A full range of SCO products are available upon request.

Please check hardware requirements of your system before ordering, as Watford Electronics cannot accept returns on any software that has been opened.

FAST ETHERNET (100baseT) PRODUCTS

Bring 100Mb/s Fast Ethernet to your desktop, simply and economically. With the increased bandwidth it is possible to have video playback

and video conferencing across the LAN. Existing level 5 UTP cabling can be used so upgrading is easy.

Ethernet Adapters

Genius GF100TX 10/100 PCI	£79
Intel EtherExpress Pro 100 PCI	£84
3Com Etherlink XL 3C905TX	£85

HUBS/REPEATERS

Genius	TP	BNC	AUI	SNMP	
GH4080 Polmtop	8	1	-	-	£79
GH4160 19" rack	16	1	-	-	£149
GH1000 19" rack	12	1	1	opt	£249
GR5050 Palmtop	-	3	1	-	£115
ER5020 19" rack	-	2	2	-	£122
ER5040 19" rack	-	4	4	-	£225

Hewlett Packard					
AdvanceStack 8U	8	opt	opt	opt	£135
AdvanceStack 12U	12	opt	opt	opt	£349
AdvanceStack 24U	24	-	1	-	£589

SMC					
Elite 3B12TP	12	1	1	opt	£399
Tiger TP6	6	-	1	-	£145
Tiger TP12	12	-	1	-	£244
Tiger CX3	-	3	1	-	£219

PRINTER SERVERS

Genius		
GPS300 Pocket Network Server	£96	

HBM Print Servers		
HB21HC In Line (1 x Parallel)	£259	
Multiserve (2 x Parallel, 1 x RS232)	£275	

Intel		
NetPort Express EL	£245	
NetPort Express XL	£285	

Note: above are for use with Novell NetWare only

SPECIAL CLEARANCE OFFERS

Ethernet Adapters			
Genius E1320 EISA Combo	£85	Intel EtherExpress 16 BNC ISA	£40
Genius E1162M Combo	£75	Intel EtherExpress 16 Flash BNC or TP ISA	£40
3Com Etherlink 16 3C507 BNC or TP	£25	Intel EtherExpress 16 Flash BNC ISA 5pk	£99
3Com Etherlink 16 3C507 BNC 5pk	£85		
3Com Etherlink III 3C529 MCA TP	£20		
3Com Etherlink III 3C590 Combo PCI	£70		
SMC Elite Plus BNC ISA	£10		
SMC Elite/A BNC MCA	£15		

Available while stocks last



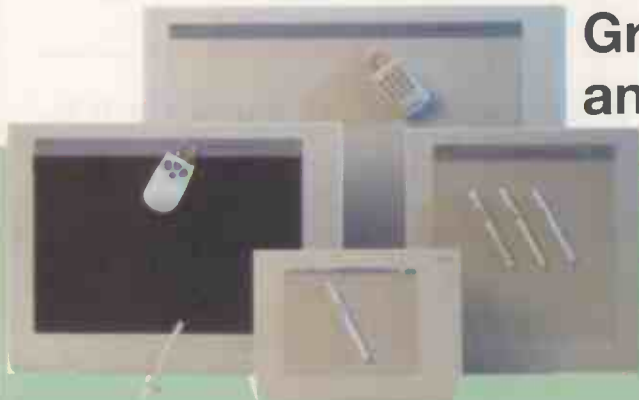
**DON'T FORGET
TO ASK FOR YOUR
FREE CD SOFTWARE
WHEN ORDERING**

GRAPHICS TABLETS

WACOM

UltraPad Series

Graphics Tablets for CAD and DTP Professionals



The natural way to use your computer for all CAD and DTP professionals

Using a Wacom UltraPad graphics tablet is as easy and natural as using a pen. Whether you're painting, retouching or working with a host of other programs, a Wacom cordless pen and graphics tablet can significantly enhance your creativity and ease of working. Pressure-sensitive pens allow you to vary line thickness, colour density or other characteristics, depending on the application. Already the most widely used graphics tablets for professional electronic artwork production, Wacom's innovative features combine ergonomics with lifelike simulation of traditional graphics tools.

You can customise your graphics tablet to match your personal style or specific requirements. There are UltraPens designed specially for handwriting recognition; UltraPens with ink or pencil lead so you can record on paper what you're drawing on-screen; and pens with thick barrels and an extra-soft feel for using with painting software.

Star of the UltraPen series is the UltraPen Eraser, the first dual-function, pressure-sensitive pen. Simply flip the pen and erase, or assign the spongy eraser tip to a drawing function such as Photoshop's Dodge and Burn. All Wacom tablets are supplied with an UltraPen Eraser and spare nibs. Various UltraPen pucks (cursor) are also available, which are ideal for CAD use.



**MACROMEDIA
GRAPHICS STUDIO
SOFTWARE INCLUDED
WITH A4, A5 & A3
GRAPHICS TABLETS**

MACROMEDIA GRAPHICS STUDIO

The Most Powerful Design Tools For Print & Internet Graphics

- Macromedia Freehand 5
- Macromedia xRes
- Macromedia Extreme 3D
- Macromedia Fontographer
- Macromedia Shockwave

UltraPen

The pressure sensitive UltraPen Eraser allows line thickness or colour density to be varied according to the level of pressure applied, just like conventional pencils, crayons or paintbrushes. The pen's slide switch can be defined to work like a keyboard key combination or mouse button and can be used to play back macros or automatically double-click.



£245 A5
£287.88 inc. VAT

£335 A4
£393.63 inc. VAT

£525 A3
£616.88 inc. VAT

* A5 & A4 tablets come with pen only
† A3 & A2 tablets come with pen & cursor

ArtPad II

ArtPad II is Wacom's smallest graphics tablet and is ideal for educators, hobbyists and children to quickly create compelling, original artwork. Ideal as a creative input device for space conscious professionals or simply for anyone in need of a mouse alternative.

Features

- Ideal for DTP, graphics, sketching and drawing where desk space is limited
- Active surface area of 4"X 5"
- 256 levels of pressure
- Comes complete with UltraPen Eraser
- Comes bundled with Fractal Design's Dabblor 2.0 SE

**Includes
Dabblor 2.0**

£119
£139.83 inc. VAT

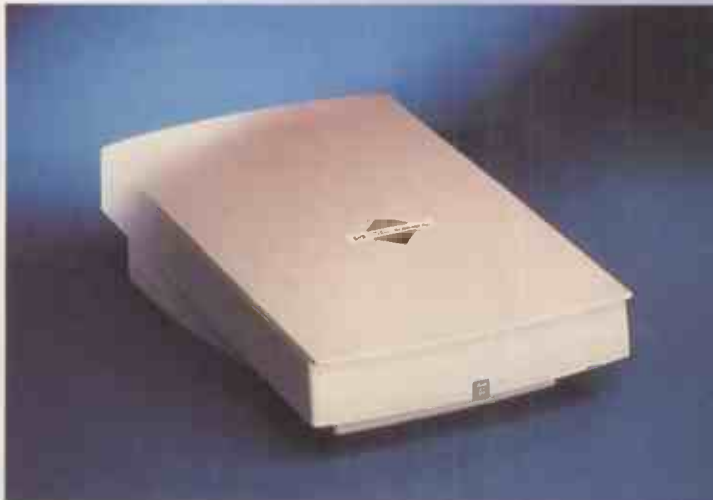


HEWLETT PACKARD SCANNERS



Hewlett Packard ScanJet 5p

The HP ScanJet 5p enables office professionals to work faster and look better at the push of a button at an affordable price



- One-pass, colour flatbed scanner
- Easy installation and setup
- Designed for small offices and first time users
- Scan with push-button ease
- Complete scanning solution
- 24-bit, 300-dpi optical/1200-dpi enhanced, letter/A4
- HP quality and reliability

Easy of Use

- Plug-and-play installation
- One-button scanning
- Automatic settings
- Works with leading software applications

Affordability

- Hitting key price points on Europe

"The HP ScanJet 5p color/grayscale scanner enables users to scan pictures, text and documents at the push of a button"

- Convenient and easy to use
- Affordable
- Image quality
- Versatile
- Quality and reliability

POA

Specifications

Scanner Type	Color/grayscale flatbed, single-pass
Resolution	300 dpi optical 1200 x 1200 enhanced
Pixel Depth	24-bit (16.7 million colors)/ 8-bit 256 grayscale levels
Scanning Speed* - 300 dpi BW drawing - 150 dpi color photo 4 x 5 in *Excluding calibration and PC transfer time	7 seconds 4 seconds
System Compatibility	IBM-compatible, 486 + Windows 3.1, 95 (NT not supported) Macintosh System 6.8030 +, 7.0+
Interfaces	Plug and Play SCSI for Windows SCSI for Macintosh
Included Software	HP PictureScan with HP AccuPage technology PaperPort for HP OCR: Caere Corel PHOTO-PAINT Select for Windows or Adobe Photoshop LE for Macintosh HP ScanJet colour copy utility
Included Hardware	Scanner, power cord, SCSI card (ISA only), cable (ISA and MCA)
Warranty	1-year warranty, HP Express Exchange (most of Europe), 1-year technical support, options HP SupportPack for 2 years of additional coverage, HP FIRST - Fax information Retrieval System by phone

HP SupportPack

PC Software Assist

What is the HP SupportPack PC Software Assist?

This HP SupportPack provides telephone assistance for usage problems on over 100 industry-leading, multivendor PC application software products - as well as the most popular PC operating systems such as Microsoft Windows '95.

See page 27 for more details



SCANNERS & GRAPHICS PAD

**NEW
LOW PRICE**

Aries Scan-it Pro® 4800P

The Smallest A4 Professional Flatbed Scanner at the Smallest Price!

- **Parallel connector** - Scan-it Pro doesn't require an interface, the computer doesn't need to be opened so it's very easy to install and your printer connects to the scanner
- **Colour, single pass scanner** at 4800 dpi
- **Copy function** - press a button on the scanner and the image will be sent direct to your printer
- **Fax function** - press a button on the scanner and the software supplied allows you to dial the number and the image is sent direct to your printer
- **OCR function** - press a button on the scanner and the OCR supplied software will read the text straight into your chosen word processing software

Type:	Flatbed with original "One Touch key" function
Scanning speed:	Full colour, 300 dpi 39 seconds (scanning time only)
Max document size:	A4
Optical resolution:	300 x 600 dpi
Max resolution:	4800 x 4800 dpi interpolated
Colour scanning method:	Single pass
Colour mode:	24 bits per pixel
Grey mode:	8 bits per pixel
Bi tone:	1 bit per pixel
Hardware interface:	EPP (Enhanced printer port)
Software interface:	TWAIN compatible
Dimension:	298(w) x 426mm(d) x 78mm(h)
Lamp:	Xenon glow lamp using cold scan technology
Weight:	Only 4.9 Kg
Power:	Standby: 2.5 Watts; Operation: 13 Watts
Software:	Image software Imageln, OCR software RecognitaPlus and Fax-Copy utility Action Manager
System Configuration:	IBM Compatible PC, 386/486/Pentium, CD-ROM drive, Win 3.11 or higher, 4Mb RAM & 20Mb hard disk
Warranty:	1 Year return to base

"The Scan-It Pro is a fantastic tool... a very snazzy compact scanner... easy to set up... the software is excellent"

Computer Shopper

Scan-it Pro scans an A4 size document, full colour, in a single pass. It comes complete with easy-to-use image and OCR software. High resolution produces better image quality. Original "One touch key" function makes it the friendliest scanner to use.



FREE
Xerox Textbridge OCR software.
Worth **£49**
£57.58 inc. VAT

AMAZING PRICE!

£139

£163.33 inc.VAT

PageReader™

PageReader turns your scanned document into a fax, a copy, a scanned or a text file for your favourite Windows™ word processor.

PageReader™ Portable

The Only Portable Touch-Free™ Solution for Faxing, Copying, Scanning and OCR.



- Faxes the scanned image through and Windows™ compatible fax software
- Copies your document directly to any Windows™ compatible printer at up to 800dpi
- One-Step OCR: Automatically "retypes" printed documents into any Windows™ word processor by scanning the page, converting to text, then launching your word processor
- Speed, 6 PPM (200dpi B&W mode)
- Interface: any available parallel port (you may simultaneously connect your printer and PageReader)

£69
£81.08 inc.VAT



Up to true 800dpi resolution and supplied complete with OCR software, a powerful presentation graphics package and an advanced image scanning, enhancement and editing application.

ScanMate Colour Deluxe

24 Bit True Colour Handheld Scanner



FANTASTIC VALUE
only **£72**
£113.18 inc.VAT

- Up to 3200 dpi resolution
 - TWAIN compliant
 - Detects up to 16.7 million colours
 - Jumperless interface card for easy installation
 - PhotoFinish 3.0 image processing software
- Image conversion from colour to grey scale or B/W
File formats: BMP, EPS, GIF, JPEG, PCX, TGA, TIFF, PCD
Supports Photo CD format
- SmartPage Direct OCR software
 - Advancing Your Desktop Abilities

The Genius ScanMate/Colour Deluxe package is your connection to the colourful publishing world. With a high resolution up to 3200 dpi, a friendlier user interface, better capability, along with advanced software programs, this package elevates your desktop publishing standards to a higher level of professionalism.

The ScanMate/Colour Deluxe design enhances your ability to scan accurately and superbly. The body shape fits comfortably with the palm of your hand. With the ScanMate/Colour Deluxe scanner, enhance your reports, etc. like a professional!

Genius KidsPad

Create a Rainbow World

The KidsPad will enable your children to discover how easy it is to draw, sketch or paint using a computer. The included education and entertainment software on CD is fun to use and will keep you and your children busy for hours. Designed especially for 4 to 10 year olds.



£45
£52.88 inc.VAT

Compatible with WIN 3.1 and WIN 95.

For ordering information, please see page 2

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Prices exclude carriage & VAT @ 17.5% except where shown

SCANNERS DIGITISERS INPUT DEVICES

SCANNERS

Aries	
Scan-It Pro 4800P A4 colour	£165
PageReader A4 Mono Portable	£69
ScanMaker E3 SCSI II 2400dpi colour	£225
ScanMaker E6 SCSI II 4800dpi colour	£319
Above E3 & E6 scanners are supplied with Adaptec SCSI II card & ImageIn Easy Pack, OmniPage LE OCR & Easy Scan software.	
Canon	
CanoScan 300	£245
CanoScan 300 + SCSI	£299
CanoScan 300 + SCSI + ADF	£459
CanoScan 600	£462
CanoScan 600 + SCSI	£505
CanoScan 600 + SCSI + ADF	£645
Epson	
GTX5000 Flatbed Scanner - parallel	£243
GTX5000 Flatbed Scanner - SCSI	£291
GTX9500 Flatbed Scanner - parallel	£519
GTX9500 Flatbed Scanner - SCSI	£545
Genius	
Scanmate Colour Deluxe	£72
Hewlett-Packard	
HP ScanJet	
A4 Flatbed Scanner supplied with Corel PhotoPaint, Caere OmniPage LE, DeskScan II and PaintPort Software	
4S Mono	£130
4P Colour	£304
4C Colour	£539
4S1 Mono	£1494
Logitech	
ScanMan Colour 2000	£77
Scanman Pagescan WIN 95/ADF	£225
Scanman Pagescan WIN 3.1	£165

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Smarter Input - Smarter Output

New Sketch

New Sketch 1212	£115
New Sketch 1812	£179
New Sketch 1812D	£199

If you need to bring precision and accuracy to your CAD or Drawing work this is probably the tool for you. Don't let your imagination down because you haven't got the tools. Especially designed for those who demand accuracy in the shortest possible time. Whatever you do Architect/Carpentry/Design/Inventor/Hobbyist/Graphics

Comes with all necessary driver software to you up and running in minutes, as well as the connection cable

EASY PAINTER £56 £65.80 inc. VAT

This amazing value graphics tablet gives you the chance to exercise your creativity. Includes PC Paintbrush for Windows that provides dozens of natural paint tools, complete Utilities Disk, Stylus Pen and keyboard power adaptor.



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UltraPad A5 Serial	£238
ArtPad 2 A6 Serial	£108

MICE

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Excel III 2 Button Serial Mouse	£8
Creative	
Aero Duet	£78
Genius	
EasyMouse Serial 2btn. £8 3btn.	£19
MouseOne 2B - PS/2	£9
Mouse 3+	£10
Mouse Dear Serial or PS/2	£9
MyMouse Colour 3B Serial (Specify colour)	£11
Logitech	
MouseMan - Bus	£39
MouseMan Cordless - Serial & PS/2	£33
MouseMan Cordless Pro - Serial & PS/2	£42
Pilot Mouse - Serial & PS/2	£15
MouseMan 96 - 3 button Serial & PS/2	£27
Microsoft	
MS Mouse v2 - Serial & PS/2	£34
MS Home Mouse	£15
MS IntelliMouse	£43

TRACKERBALLS

Genius	
HiPoint Trackerball - Serial & PS/2	£19
HiTrak Trackerball - Serial & PS/2	£22
Logitech	
Pilot TrackMan	£24
Trackman Voyager	£44
TrackMan II Combo - Serial & PS/2	£39
Trackman Portable - Serial & PS/2	£30
Microsoft	
MS EasyBall	£28

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PCMCIA	
Game Card II - Ideal for Notebook Computers	£45
CH Products	
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Virtual Pilot Yoke	£53 Pilot Pro Yoke £60
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CS200 Analogue	£7.50
Gravis	
Analog Joystick	£20
Analog - Pro	£26
Advanced Gamepad	£17
Logitech	
Thunder Pad	£14
Wingman Light	£14
Wingman	£23
Wingman Extreme	£29
Wingman Warrior - New	£49
Microsoft	
Sidewinder 3D Standard	£20
Sidewinder 3D Pro with Hellbender	£43
Sidewinder GamePad	£25

Excel CS200 PC Joystick

A high quality analogue PC joystick with Turba Switch **Offer Price £7.50**

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Aries	
Aries 102 Key UK Keyboard	£12
(1) Aries Windows 95 105 Key Keyboard	£12
(2) Aries Advance Keyboard - Designed for Windows 95 enhanced keyboard soft touch and silent, tactile feedback, adjustable wristpad for a comfortable support and rest.	
Special Offer	£21.95
(3) NEW Aries Ergonomic Windows 95 105 key keyboard	£27



Cherry G83-6105 LAMGB Membrane	£19
Cherry G80-3000 Soft Touch	£35
MS Natural Keyboard	£45

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Canon	
PowerShot 600	£625
Casio	
QV 10A	£269
QV 100	£395
QV 300	£569
QG 100 Printer	£159
Epson	
PhataPC 500	£295
LCD Monitor	£145
Optional Power Supply	£55
Fuji	
DS-7	£435
Kodak	
DC20	£136
DC25	£295
DC40	£359

CASIO

Digital Colour Output...

CASIO QV300 DIGITAL CAMERA

Main features

- Dual Focus Lens - Standard and telephoto
- Large 2.5" LCD display
- Macro Function (to 7cm)
- 640 x 480 VGA resolution
- 400 line video resolution
- 4MB Flash ROM Memory
- 192 QVGA Images
- 64 VGA images
- 270 degree lens rotation
- PC or MAC software and connection kit included

£569
(£668.58 inc. VAT)



NEW

CASIO QV100 DIGITAL CAMERA

Main Features:

- 640 x 480 VGA Resolution
- 4Mb memory
- 192 images @ Low Resolution QVGA
- 64 images @ High Resolution VGA
- 270 Lens rotation
- Macro Lens facility
- 1.8" TFT low glare lit colour LCD screen
- 400 line video resolution
- AC adaptor option
- Self-timer shutter



£395
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Special Bundle
Price with QG100 Printer
£545
(£645.08 inc. VAT)

- Numerous accessories including:
 - Soft case
 - Hand strap
 - 4 x AA Batteries
 - Cleaning cloth
 - Computer connection

CASIO QV-10A DIGITAL CAMERA

- Built-in high Resolution colour 1.8" TFT LCD screen
- 96 image memory
- Transfer images to PC/Windows, Mac compatible
- Ideal for Web page creation, dip, reports, presentations, e-mail etc.



£269 (£316.08 inc. VAT)

Special Limited Offer

CASIO QV-10A BUNDLE

- Links to all casio's QV digital cameras
- Dye sublimation adhesive colour prints
- Choice of tape sizes 18mm, 36mm, or 46mm



£159 QG100 ONLY (£186.83 inc. VAT)

Special Bundle Price
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(£499.38 inc. VAT)

QV10A

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EPSON

NEW

GT-9500 SCANNER

The highest quality and most affordable colour flatbed scanner in its class.

**INCLUDES FREE
IMAGING &
OCR SOFTWARE**



Parallel £519
£609.83 inc VAT

SCSI £549
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Complete professional mono and colour scanning solutions for PC users.

- High speed and easy to use
- 4800 dpi and 36 bits per pixel in colour providing 68 billion colours
- SCSI and Bi-directional parallel interfaces built-in
- Advanced scanning options - TET, batch, page frame and negative film scanning
- Full support for Windows '95, 3.1x
- Optional transparency unit and document feeder
- 1 year RTB warranty (optional 3 year on-site)

3 years on-site warranty Epson CoverPlus - £149

GT-5000 SCANNER

Epson quality colour scanning. Made easy, Made affordable

**INCLUDES FREE
IMAGING &
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£284.35 inc VAT

SCSI £291
£341.93 inc VAT

In addition to advanced features like Epson Text Enhancement Technology,

a maximum resolution of 2400dpi* - and specially developed user interface the Epson GT-5000 comes complete with dedicated software for PC users. Applications that will enable you to take on a wide range of everyday and more demanding DTP tasks.

You can scan everything from photos to magazine cuttings, typed manuscripts to A4 business documents - in colour or high speed mono and with Epson flatbed precision.

* Interpolated

3 years on-site warranty Epson CoverPlus - £65

NEW

EPSON PhotoPC 500

Colour Digital Camera.

The Epson PhotoPC 500 is the ideal way to add high quality colour photos to your computer.



Now you can add the impact of real life pictures to your letters, documents and presentations quickly and easily with the Epson PhotoPC 500 colour digital camera.

- High quality 24 bit colour images
- Capacity for 30 high resolution or 60 standard images
- Windows and Macintosh compatible
- Twain compliant
- Built-in automatic flash with red-eye reduction feature
- Self timer
- Auto focus from 2 feet to infinity
- Expandable storage for up to 200 images
- PhotoEnhancer photo editing software
- Optional LCD display
- Output your pictures with photo-real quality on an Epson Stylus inkjet printer

PhotoPC 500

£297
£348.98 inc. VAT

LCD Monitor

£145
£170.38 inc. VAT

Optional Power Supply

£55
£64.63 inc. VAT

Commodore PC Music Keyboard by Evolution

Commodore MK10 MIDI keyboard with software

- 49 Mini Sized Keys
- Standard MIDI Connection
- Supplied with PC Connector Lead
- Includes Fun Music Software
- Turns your computer into a home keyboard
- 16 Great Styles
- 6 Part Virtual Band with Jammer
- Playlight melody correction mode
- Mixer with voice selector
- Easy Single Finger Play Mode
- On-Screen Keyboard
- Record your own melodies

Also Available: **CMK149 Full Size MIDI keyboard with Software**

1. Intro offer **£96.95** (£113.91 inc. VAT)
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£40.45

**£47.53 inc. VAT
Introductory Price**

**e Commodore by Evolution:
The PC Music Solution**



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NOW AVAILABLE HAYES ACCURA ULTIMATE CHALLENGE

COMPLETE INTERNET SOLUTION

ACCURA 336 Internet Kit Deluxe

- 33,600 bit/s data/fax external modem
- High-speed send and receive fax
- Quarterdeck Internet Suit 2 and Webtalk
- Cables and communications software included
- Voice/data/fax and Internal versions available



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Hayes 'The Inventor of the PC Modem'

Each Hayes product includes the FREE Hayes CD-ROM which contains:

- 30 days free Internet access via Premier Internet
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LOW COST INTERNAL MODEM

ACCURA 336 Internal With Voice

- 33,600 bit/s voice/data/ fax internal modem
- Full Duplex Speakerphone
- Voice messaging and fax-on-demand
- Quarterdeck Internet Suite 2 and WebTalk
- Communications software included
- Data/fax and external versions available



£152.34 £179 inc VAT

ADVANCED BUSINESS MODEMS

OPTIMA 336 Business Modem

- High Speed 8:1 Data Compression
- Up to 230,400 bit/s throughput
- Dial-back security
- Remote configuration
- Flash upgradeable
- Leased line support
- Voice messaging capabilities



£198 £232.65 inc VAT

PORTABLE MODEMS OPTIMA V.34 Fax PC Card

- High-speed 33,600 bit/s laptop modem
- Flash upgradeable
- Power saving feature
- Internet and communications software included
- GSM Accessory Kit available

PC Card
£151
£177.43 inc VAT

GSM Kit
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£102.23 inc VAT



ISDN COMMS NEW ACCURA ISDN

- Low cost ISDN modem
- Transmit data up to 460,800 bit/s with data compression
- Automatic ISDN/analogue call detection
- Plug and play
- Two analogue ports
- Flash ROM upgradeable

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Hayes

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3400 PRO Desk Top £104
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Netlink Gold V.32 NEW £74

Please state internal or external when ordering

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0780 Linnet 34 FX £149
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0260 Ultralink 32 £49

Psion Dacom

Surfer 33.6 £119



U.S. Robotics

	Ext	Int
Sportster V14,400 Fax/Modem	£76	£76
Sportster Voice 33,600	£129	£129
Courier V.34 I ISDN	£195	£195
Courier I V.34 Analogue or ISDN	£269	—
Sportster 28800 Xjack PCMCIA	£115	—
X2 Upgrade	POA	—

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25 Male - 25 Female 2m £7
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Avro Pacific Six Piece Kit £21.26
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Psi Win RS232 Serial Link -3A £68
Parallel Interface Link - Siena & 3C £34
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SSD Drive - Siena & 3C £75
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Fax Modem for Series 3A £149
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Leather Case-3A £18
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US Robotics



Pilot 1000 £185
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ISDN

British Telecom

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Hayes

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33600 Voice fax Modem from £64.95

FAX MODEMS

33600 VOICE-COMPARE OUR PRICES, WE WILL NOT BE BEATEN

LASAT Safire 33.6 Voice Fax Modem



The Lasat Safire 33,600bps External Fax Modem combines beautiful design, high performance and compact size.

- High connectivity reliability for PC users requiring access to electronic mail systems, bulletin boards, sound & data transmission, etc.
- Advanced telephone answering machine and fax machine features included.
- Safire 33.6 will detect whether the call is a fax, data transmission or telephone call.

£119
£139.83 inc VAT

LASAT CREDIT 288

Having the size of a credit card, LASAT Credit 288 is one of the smallest fax/modems on the market - designed for use with notebook and palm-top computers with PC-card type II slots.

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LASAT FlexCard 288/E

The FlexCard 288/E is a type II PC card combining the functionality of a fully featured V34 fax/modem and an Ethernet LAN adaptor.

- Enables easy access to corporate networks, E-mail, Internet, on-line services and fax facilities.
- Provides simultaneous operation of LAN adaptor and fax/modem functions.
- Compatible with Windows 95 Plug n Play.

£285
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LASAT Unique 1280 mi

The unique 1280 mi ISDN terminal adapter combines the speed and safety of ISDN with a fully featured 33,600bps voice/fax modem.

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TELES AG



TELES ISDN Communications Products & Solutions

Best selling ISDN products in the World today. Product packages come complete with:

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- multimedia communications
- videoconferencing

plus all the communications services you would expect, such as file transfer, telephony and G3 FAX.

Support for the most popular Operating Systems:

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- Windows NT
- DOS, OS/2
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External ISDN Box
Include: PowerPack Software

£179 £210.33 inc. VAT

TLS-S0 (Parallel Port Box)

£179 £210.33 inc. VAT

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(Intelligent PBX to 2 Analog ports)

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Include: PowerPack Software

£99 £116.33 inc. VAT

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TLS-PCMCIA

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V34vi 33600 baud Voice Fax/Modem



Unbelievable Offer

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EDITORS' CHOICE

The Easiest way to Connect and Learn the Internet
Aries Internet/Communication Pack consists of: Aries Fax/Modem

If you want to get onto the Internet or send faxes from your PC then you need Aries Modems. Each modem is tested by our technicians and comes with Compuserve trial kit including 10 hour Free Internet access, Free Netscape World Wide Web Browser Software, Free 30 days unlimited access to the internet via Pipex or AOL plus full Superfax Voice data and fax software.

Turn your PC into a Fast Moving Communications Centre by using an Aries Modem

INTERNAL **£64.95** £76.32 inc VAT EXTERNAL **£69.95** £82.19 inc VAT

FREE EASYWEB*
Worth £29.95
With Aries V34vi Modems

Create and set up your own WebSite easily with EasyWeb



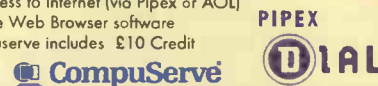
V32bis 14,400bps

WHILE STOCKS LAST

Internal **£25**
(£29.38 inc VAT) BABT Approved Fax/Modem.

All Fax/Modems supplied by Watford Electronics include:

- FREE 30 days unlimited access to Internet (via Pipex or AOL)
- FREE Netscape World Wide Web Browser software
- FREE Subscription to Compuserve includes £10 Credit
- Software supplied in CD



Aries PCMCIA 33,600 baud Fax/Modem



INCREDIBLE VALUE

£99
£116.33 inc VAT

- 33.6 Operational modes: V.34 (up to 33.6 kbps), V.32bis (14400bps), V.32 (9600bps), V.22bis (2400), V.22 (1200), V.23 (1200/75), V.21 (300) Asynchronous data, full duplex over dial-up lines.
- Fax Interface: EIA 578 (Class 1), EIA 592 (Class 2)
- Auto-Dial: Tone dialling, Auto-senses speed of called modem.
- PC Interface: PCMCIA (V2.01).
- Other features: BABT approved, CE approved.

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Hitachi 8X CDR7930	£63
Panasonic 8X CR583	£59
Ten Speed	
Aries 10x	£67
Aztech 10x CDA1068-011	£73
Acer 10x	£65
Twelve Speed	
Aries 12x	£85
Acer 12x	£89
Hitachi 12x (runs up to 16x)	POA
Mitsumi FX120 12x	£95
Sixteen Speed	
Goldstar GCD-R516B	£89
Acer 16x	POA

SCSI CD-ROM DRIVES

Eight Speed	
Plextor 8Plex 83CS internal	£156
Plextor 8Plex External	£242
NEC 8X CDR-1410	£143
NEC 8X External	£203
Twelve Speed	
Plextor 12Plex Internal	£222
Plextor 12Plex External	£287
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Amacom 4x external with sound	£194
Backpack 4x	£139
Backpack 4x with Sound	£218
Freecom Power CD/8x external	£149
Amacom 8x external	£199
Amacom 8x external with sound	£269
Backpack 8x	£233
Backpack 8x with Sound	£305

PCMCIA CD-ROM DRIVES

Panasonic	
Travelspin KXL-D720X	2X £265
Travelspin KXL-D740	4X £269
Freecom	
Power CD/PCMCIA	8X £195

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Writable CD Gold Discs	£7
HP Surestore 6020i	£319
HP Surestore 6020es	£369
HP Surestore 6020ep	£369
Yamaha	
Internal 4X CDR400 Entry Level	£499
Internal 4X CDR400 Full Kit	£549
Traxdata	
CDR2600EL 6xR 2xW Entry Level	£319
CDR2607 6xR 2xProf Kit	£349
CDR4600EL 6xR 4xW Entry Level	£499
CDR4607EL 6xR 4xProf Kit	£549
Press-It CD Labelling Kit	£549
Internal 4X CDR400 Full Kit	£29.99
Internal 4X CDR400 Full Kit	£549
Internal 4X CDR400 Full Kit	£549
Internal 4X CDR400 Full Kit	£549
Internal 4X CDR400 Full Kit	£549

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Nakamichi NA-MJ48 8X4 CD EIDE Int. £265

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Aries Multimedia Kit '97

Aries Multimedia kit contains the following:

- 16 bit plug n play sound card
- Aries Stereo Speakers
- Includes Audio & IDE Leads
- CD ROM Drive

Aries Six Speed Internal	£75
Aries Eight Speed Internal	£85
Aries Ten Speed Internal	£99
Aries Twelve Speed Internal	£129

Creative Labs

Microsoft Family 8X 32 PnP	£208
Discovery 32 8X PnP	£155
	SPECIAL OFFER

Aries Speakers

Stereo speakers	£9
10W HiFi speakers	£19
15W HiFi speakers	£25
25W Digital speakers	£29
80W Digital speakers	£39
80W UltraPower+ speakers	£42
120W MegaPower speakers	£59
Stereo Headphones	£5
Screen microphone	£7.50

Aztech

8x CD ROM, 16bit S/Card, +13 Multimedia Titles £99

SOUND CARDS

Aries

16 Bit Sound Card with 3D - no IDE (Sound Blaster Compatible) £29

16 Bit Sound Card with PnP with IDE interface (Sound Blaster Compatible) £27.50

Wave Table Sound Card with 3D (Sound Blaster Compatible) £49

Creative Labs

Creative Blasterkeys midi k/board	£110
Sound Blaster 16 IDE Value PnP	£58
Sound Blaster 32 PnP	£76
Sound Blaster AWE 64 + Internet Software	£119

Gravis

UltraSound MIDI Kit	£39
UltraSound PnP	£115
UltraSound PnP Pro	£129

Miro

SoundPCM20 Radio £189

Orchid

NuPanel £22

MIDI KEYBOARDS

Evolution CMK149 full size MIDI Keyboard with software **Intro offer** £96.95

Evolution CMK10 MIDI Keyboard with software **Intro offer** £40.45

PINNACLE VideoDirector

VideoDirector Studio 200

Professional special effects for home videos

£215
£252.63 inc VAT



Making a great video is more than just having good shots. It's putting those shots in the right order and adding sound, titles and professional transitions. That's where the new VideoDirector Studio 200 comes in. It's a complete and economical home video editing solution that takes advantage of the equipment you already own: a camcorder, a VCR and a personal computer. Turn great footage into great video in three easy steps.

- 1. CHOOSE SCENES:** Using the SmartCable, connect your VCR, camcorder, computer and TV together. Attach the small Studio Mixer to the back of your computer (no boards to install), and choose which scenes you want to use in your final edited tape. Encapture still images into your computer to help identify each clip or save them to print.
- 2. ORDER SCENES:** Using the VideoDirector software, put these shots in the order you want them to appear. Add titles, music*, voice-overs* and special effect transitions like wipes and dissolves.
- 3. MAKE TAPE:** Press "Make Tape" and sit down while VideoDirector copies each of the shots you selected directly from your camcorder to your VCR, creating a perfectly edited professional looking tape.

*Sound card needed to assist with sound editing.

The World's Easiest Video Editor

Now you can edit your video tapes to include only your favourite footage

Just plug the included SmartCable into the serial port of your PC, and connect your camcorder and VCR

- Setup - VideoDirector automatically configures itself to work perfectly with your camcorder and VCR.
- Tutorial and On-line help - from a "Getting Started" tutorial to extensive on-line help, we've made sure you'll get the most out of VideoDirector.
- Drag and drop editing - use your mouse to arrange your highlights in any order you like.
- Source deck (plays your original tape): Supports all camcorders with an infrared remote control, all 8mm and Hi 8 camcorders.
- Record deck (records your edited tape): any VCR with an infrared remote control.



£37
£43.48 inc VAT

For ordering information, please see page 2

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GRAPHICS & VIDEO/TV CARDS

GRAPHICS CARDS



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2Mb RAM Super VGA VL		£45
1Mb Super VGA	ISA	£35
1Mb Super VGA	VL	£29

DIAMOND

1Mb Stealth 64 Video DRAM PCI		£47
2Mb Stealth 64 Video VRAM PCI		£129
4Mb Stealth 64 Video VRAM PCI		£198

NEW! Diamond 2Mb Stealth 3D 2240 Multimedia Accelerator

		£72
2Mb Edge 3D 2200XL DRAM PCI		£89
4Mb Edge 3D 3400XL VRAM PCI		£189

MATROX

2Mb Millennium PCI		£118
4Mb Millennium PCI		£156
2Mb to 4Mb Upgrade		£64
2Mb to 8Mb Upgrade		£174
4580 Millenium 4Mb to 8Mb Upgrade		£128
2Mb Mystique		£99
4Mb Mystique		£135

Special Offer

2Mb Thunderbolt DRAM PCI Graphics Card by Techworks	£75
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HERCULES

Dynamite 128 2Mb		£72
Dynamite 128 4Mb		£95
1Mb Hercules Stingray 64 Video PCI		£45
2Mb Hercules Stingray 64 Video PCI		£46
2Mb Hercules Graphite Terminator 64 VRAM PCI Bus		£185
4Mb Hercules Graphite Terminator 64 VRAM PCI Bus		£279

NUMBER NINE

2Mb EDO 9FX Reality 332 (S3 Virge) PCI + Games Pack		£142
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ORCHID

2Mb Fahrenheit Video 3D DRAM PCI		£110
4Mb EDO Righteous 3 DRAM PCI		£167

STB

1Mb Powergraph 64 DRAM PCI		£57
2Mb Powergraph 64 DRAM PCI		£66
2Mb Velocity 64 MPEG VRAM		£175
4Mb Velocity 64 MPEG VRAM		£265
2Mb LightSpeed 128 PCI		£109

VIDEOLOGIC

1Mb GrafixStar 400 DRAM		£39
2Mb GrafixStar 400 DRAM		£48
2Mb GrafixStar 450 DRAM NEW		£62
2Mb GrafixStar 600 MDRAM		£82
2Mb GrafixStar 700 VRAM		£154
4Mb GrafixStar 700 VRAM		£299
VMC Controller		£38
1Mb RAM Upgr. GrafixStar 300/400/500		£15
2Mb RAM U/G GrafixStar 700 inc VMC		£143
2Mb RAM U/G GrafixStar 600 inc VMC	POA	
4Mb Apocalypse 3D PCI SGRAM		£125

VIDEO

CONNECTWARE

1MB RasterMedia 3in1 with tuner card (Whilst stocks last)		£289
2MB RasterMedia 3 in 1 with tuner card (Whilst stocks last)		£339
TV Tuner/Video Card		£95

CREATIVE LABS

Video Blaster SE100		£122
3D Blaster PCI		£133
Video Blaster RT300		£199
TV Coder External		£103

FAST

FPS60 PowerPack (with MPEG)		£455
Movie Machine II		£357
MPEG Extension for Movie Machine		£222
MJPEG Extension for Movie Machine		£270
FPS60 Video Capture Card		£349
Screen Machine II - ISA		£585
AV Master PCI		£699

HAUPPAUGE

WinTV PCI		£89
WinTV Primio		£65
WinTV WinCinema Pro		£199
WinTV WinMotion 60 MJPEG		£294
WinTV Magic MJPEG		£210

MIRO

Video DC10		£292
MEDIA VIEW 2Mb PCI		£225
MEDIA VIEW 2Mb TV PCI		£365
MEDIA Adventure set (inc. 3D graphics card, 3D glasses & surround card)		£197
MEDIA Adventure set (inc. 3D graphics card, 3D glasses)		£165
TV Upgrade		£155
Remote Control Upgrade		£49
Video DC30		£789

PINNACLE SYSTEMS

VideoDirector Home v1.1 WIN		£42
VideoDirector Home WIN suite v2.5		£85
VideoDirector Studio 200		£254

ORCHID

1Mb Kelvin Video 64 PCI		£55
2Mb Kelvin Video 64 PCI		£75

VIDEOLOGIC

Captivator Pro ISA		£154
Captivator Pro TV ISA		£189
MPEG Player		£188
MPEG Star U/G for Grafixstar 400		£39



Apocalypse 3D

Explosive Acceleration for 3D Games

The Ultimate High Performance 3D accelerator for the games enthusiast

With awesome 3D power, Apocalypse 3D brings arcade-level performance to your Pentium PC. Designed to run the latest 3D games, Apocalypse 3D uses the revolutionary PowerVR technology from VideoLogic and NEC, plus a full 4 MB of SDRAM on-board texture memory, to provide outstanding 3D gameplay.



- Arcade-level games performance on the PC
- Powerful acceleration of Direct3D games
- Experience advanced 3D realism as never before with PowerVR games titles
- Two special edition games for FREE - ULTIM@TE RACE and Mech Warrior2
- High level of games support with over 00 compatible titles in development
- Voted number one 3D games card in twelve separate press reviews!
- PCI Plug and Play card - no connection to your graphics card required
- 4MB of high performance SDRAM texture memory on board
- Optimal platform: P166 with 32MB RAM. Minimum requirement; P100 with 24MB RAM



£125
£146.88 inc VAT

IDEAL PARTNERS - Special bundle price: £195
(£229.13 inc VAT)



GRAFIXSTAR 600
£75 £88.12 inc VAT

Defining a new performance standard for Windows acceleration, GrafixStar 600 is the PCI graphics accelerator for today's demanding Windows applications. Based on the revolutionary 128-bit Tseng Labs ET6000 graphics processor, GrafixStar 600 delivers better performance than today's accelerators.



Hauppauge PCI WIN/TV

plus GRAFIXSTAR 400 - 2MB

SPECIAL OFFER

TV/Teletext Card

- 122 Channel Cable ready TV tuner
- Professional Teletext with Print, Save, DDE
- PCI bus architecture supporting resolutions up to 1024x768
- Easy Windows 95 Plug & Play installation
- Compatible with high end video cards supporting Microsoft's Direct Draw drivers
- No cables to VGA card required
- Captures pictures to your PC
- Captures AVI clips at 25 fps



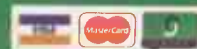
£119.95
£140.94 inc VAT

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AS SEEN ON WIN/TV

**DON'T FORGET
TO ASK FOR YOUR
FREE CD SOFTWARE
WHEN ORDERING**

WINDOWS 95 PLUG-n-PLAY

Turn on and tune in to Win/TV CinemaPro! There's no easier or more powerful way for Windows 95 users to put 125 TV channels (and pro Teletext!) on a standard VGA screen. No fiddly switches or cables - just plug-n-Play!

UP TO 16 CHANNELS ON ONE SCREEN

Capture pro-quality stills or motion video in Microsoft AVI.

**COMPUTER
SHOPPER**

... the card of choice for anyone who wants 'professional' teletext-handling facilities.

... ease of use is hard to beat.

**Computer
RECOMMENDED**



WIN/TV CinemaPro

Card Spec:

- 122 Channel Cable ready TV tuner
- Professional Teletext with Print, Save, ODE
- ISA bus architecture supporting resolutions up to 1280x1024
- Easy Windows 95 Plug & Play installation
- Compatible with all video cards
- Captures pictures to your PC
- Captures AVI clips at 25 fps with full screen playback
- Windows 95, Windows 3.11 and Windows NT drivers
- Upgradeable to optional MPEG hardware with scalable window size

£199
£233.63 inc. VAT

Video Magic

MJPEG board:

- ISA bus architecture with 1/2 PAL capture at 25 fps
- MJPEG capture reduces disk space by up to 100:1
- S-Video in and out
- Full screen PAL output
- Bundled with 32 bit digital video software worth over £275
- Connects to all video recorders
- Allows you to create MPEG video clips

£215
£252.63 inc. VAT

WIN/TV PCI

Card Spec:

- 122 Channel Cable ready TV tuner
- Professional Teletext with Print, Save, ODE
- PCI bus architecture supporting resolutions up to 1024x768
- Easy Windows 95 Plug & Play installation
- Compatible with high end video cards supporting Microsoft's Direct Draw drivers
- No cables to VGA card required
- Captures pictures to your PC
- Captures AVI clips at 25 fps

£89
£104.58 inc. VAT

Tune in with the cable-ready tuner and scheduler. All your favourite TV programmes will appear as you wish. Surf channels with a single click.

TRULY MOVING PRESENTATIONS

Make digital movies on your hard disk. Playback from a camcorder or video. Create truly moving presentations on Powerpoint or Compel or multimedia packages such as Authorware. And turn your Home videos into 16-million colour blockbusters!

Check out the specs. Get ready for the spectacular!

Hauppauge!

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MONITORS

CTX

THE MONITOR COMPANY

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1569 MS

The Award Winning CTX 1569MS brings the innovative technology behind a high quality, high specification monitor, combined with the latest multi-media features at an affordable price. The attractive space saving unit is the 15" FST perfect multimedia solution for the home, office, education and entertainment markets.



- 15" FST
- 0.28mm dot pitch
- 30 - 69kHz horizontal freq.
- 50 - 120Hz vertical freq.
- 1280 x 1024 Max Resolution
- On screen display
- TCO Compliance
- Integrated Dome Speakers
- Microphone
- Headphone
- Headphone Jack
- Plug and Play

1569 MS

1569 S

£229 £269.08 inc. VAT

£219 £257.33 inc. VAT

3 YEAR WARRANTY

1765 D



- 17" CRT
- 0.28mm dot pitch (anti-glare, anti static)
- 30 - 65kHz horizontal freq.
- 50 - 120Hz vertical freq.
- 1280 x 1024 Max Resolution
- Digital control
- Windows Plug & Play
- EPA, MPRII, CE

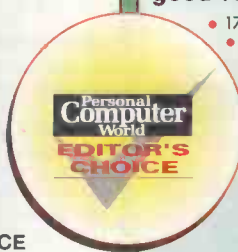
£349 £410.08 inc. VAT

1565 D



- 15" CRT
- 0.28mm dot pitch (anti-glare, anti static)
- 30 - 65kHz Horizontal freq.
- 50 - 120Hz vertical freq.
- 1280 x 1024 Max Resolution
- Digital control
- Windows Plug & Play
- EPA, MPRII, CE

£199 £233.83 inc. VAT



1785 XA

PC Magazine - Highly Recommended
"Good viewing - panel scores and an impressive feature list ensure that the CTX 1785XA is very good value for money."



- 17" Diamondtron Screen
- 0.26mm Aperture Grille
- Antistatic, anti reflection screen
- 30 - 85kHz horizontal
- 50 - 120Hz vertical freq.
- 1600x1200 NI Max Res
- On screen display
- TCO Compliance
- Plug and Play

Other Monitors Available

14" - 1451CLR	£142	£152.65 inc. VAT
15" - 1565D	£195	£229.13 inc. VAT
15" - 1569S	£249	£292.58 inc. VAT
17" - 1765D	£395	£464.13 inc. VAT
17" - 1785S	£395	£464.13 inc. VAT
20" - 2085 GM	£749	£880.08 inc. VAT

1785 XA

1785 S

£459 £539.33 inc. VAT

£399 £468.83 inc. VAT

1451 CLR

- 14" CRT
- 0.28mm dot pitch (anti-static, anti-glare)
- 30-50KHz Horizontal freq.
- 50-90Hz Vertical freq.
- 1024 x 768 max resolution
- Vertical/Horizontal position, size, brightness, contrast
- EPA, MPRII, CE

£145 £170.38 inc. VAT

2185 XE

- 21" CRT
- 0.26mm dot pitch (anti-static, anti-glare)
- 30-85KHz Horizontal freq.
- 50-120Hz Vertical freq.
- 1600 x 1200 max resolution
- Digital Control
- Windows Plug & Play
- EPA, MPRII, CE

£999 £1173.83 inc. VAT

2085 XE

- 20" CRT
- 0.28mm dot pitch (anti-static, anti-glare)
- 30-85KHz Horizontal freq.
- 50-120Hz Vertical freq.
- 1600 x 1200 max resolution
- Digital Control
- Windows Plug & Play
- EPA, MPRII, CE

£749 £880.08 inc. VAT

1769 MS 17" MultiMedia Monitor



- 17" CRT
- 0.28mm dot pitch (anti-glare, anti static)
- 30 - 65kHz horizontal freq.
- 50 - 120Hz vertical freq.
- 1280 x 1024 Max Resolution
- Digital control
- Windows Plug & Play
- EPA, MPRII, CE
- Stereo Speakers

£429 £504.08 inc. VAT

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MONITORS

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MONITORS

EnergyPro 14" LR SuperVGA

0.28mm dot pitch, EnergyStar compliant, supports up to 1024x768 resolution £139
Aries Multiscan Monitors

Aries Alphascan Pro LR

1024 x 768/72Hz (NI) H-Sync 70KHz, Front Mounted user controls. £179

Aries EnergyPro 15" LR

15" Colour Display, 0.28mm dot pitch, 1280 x 1024/60Hz NI, EnergyStar Compliant. Microprocessor Cntrls £189

Aries EnergyPro 17" LR

17" Colour Display, 0.28mm dot pitch, 1280x1024/60Hz NI, EnergyStar compliant. Microprocessor Controls £329

Samsung Syncmaster Monitors

3NE 1024 x 768 CVP 14" £164
15GLE 1024 x 768 15" £224
15GLI Plug and Play 280x1024 15" £261
17GLI NI 1280x1024 17" £462
17GLSI NI 1280x1024 76Hz17" £549

Sony Multiscan Monitors

CPD-100SX 15" £255
CPD-15SF2 15" £297
CPD-17SF2 17" £485
GDM-17SF2 17" £699
CPD-20SF2 20" £1069

Taxan Ergovision Monitors

EV 410LR 14" £176
530TCO 15" £269
730TCO 17" £445
740TCO95-S M/M 17" £579
1080TCO 20" £775
2150TCO 21" £1175

CTX Monitors - 2 years On-site warranty

1451CLR 14" £142
1565D 15" £195
1569S 15" £249
1569MS MultiMedia 15" £245
1785S 17" £395
1785XA 17" £490
2085GM 20" £749

Iiyama Monitors

MF-8515F 15" £249
MF-8617E 17" £489
MF-8617ES inc. speakers 17" £499
MT-9017T Diamondtron 17" £549
MF8221T 21" £959
MT9021T 21" £999
Iiyama 3 year on-site warranty £49

NEC Multiscan Monitors

M500 15" £374
M700 17" £634
P750 17" £705
XE21 21" £1129
XM29 MultiMedia 29" £2329
XM37 MultiMedia 37" £5030

Nokia Monitors

449M 15" £299
449E 15" £275
449XI 15" £279
447V 17" £394
447E 17" £487
417TV 17" £585
445XI 21" £979

Panasonic Monitors: All Panasonic monitor prices include 2 years On-site warranty

TX-D1563 4G 15" £245
TX-D1565 15" £219
TX-D1734U 5G 17" £385
TX-D1753 17" £515
TX-D2162U 21" £1049
Panoview 530 9.4" TFT £1599
Panoview 550 10.4" TFT £1799
Mitsubishi
DiamondScan 15HX .28dpi 15" £240
DiamondScan 17HX .26dpi 17" £425
Diamond PRO87TXM .25dpi 17" £475
Diamond PRO21TX .3dp 21" £1095



DIAMOND CRT MONITORS

WHY DIAMONDTRON

The DIAMONDTRON CRT takes Trinitron technology to new levels of excellence delivering more accurate, sharper images. The combination of DIAMONDTRON CRT's advanced electron gun and phosphoring techniques ensures brightness and colour are maintained at a low dot pitch. Compact (Energy Star and Nutek) and conform to safety standards (TCO 92).

MITSUBISHI DIAMOND PRO 91TXM

The Diamond Pro 91TXM aims to meet the needs of graphic and CAD users who require high resolution, high quality 21" monitors. Featuring Mitsubishi's latest 0.28mm CRT, the monitor reaches a maximum non-interlaced resolution of 1600 x 1280 at a rate of 75Hz.



£1095
£1286.63 inc VAT



MITSUBISHI DIAMOND PRO 87TXM

The Diamond Pro 87TXM is a 17" monitor aimed at professionals in the corporate marketplace as well as CAD users, designers and multimedia experts. Featuring Mitsubishi's patented DIAMONDTRON technology, the monitor reaches a maximum non-interlaced resolution of 1280 x 1024 at a refresh rate of 75Hz.

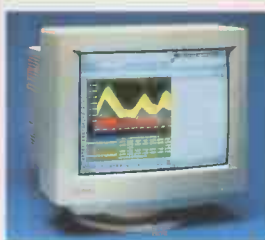
£475
£558.13 inc VAT

MITSUBISHI DIAMOND SCAN 17HX

The Diamond Scan 17HX, 17" colour monitor is a practical performance option for word-processing, desktop publishing and CAD/CAM applications. The monitor features a flat-square CRT with Invar shadow mask, delivering a maximum non-interlaced resolution of 1280 x 1024 at a refresh rate of 75Hz with a dot pitch of 0.26mm.



£425
£499.38 inc VAT



MITSUBISHI DIAMOND SCAN 15HX

The Diamond Scan 15HX, 15" colour monitor offers an extensive array of features at a practical price, making it a staple for corporate environments. Featuring a flat-square CRT with Invar shadow mask, the monitor reaches a maximum non-interlaced resolution of 1024 x 768 at a refresh rate of 75Hz.

£449
£527.58 inc VAT

MITSUBISHI DIAMOND PRO 67TXV

The Diamond Pro 67TXV is a 17" monitor for the multimedia age delivering high-quality images in the finest detail thanks to Mitsubishi's patented DIAMONDTRON technology. The monitor reaches a maximum non-interlaced resolution of 1280 x 1024 at a refresh of 60Hz with a 0.25mm dot pitch.



£425
£499.38 inc VAT

FIRST UK SHOWING

3 year RTB. 24-hour product replacement in the first year.

Panasonic MONITORS

THE ULTIMATE SCREEN SAVER

Benefiting from 50 years design and engineering experience with audio visual products, you can be assured that the latest range of Panasonic monitors meet the most stringent European standards, perform to the highest level and come with an outstanding 2 year on-site exchange warranty.

PanaSync 4 (TX-T1565)

15" Digital Chassis, 0.27mm dot pitch, 1024 x 768 @ 84Hz, max 1280 x 1024, Power Save (Energy Star), VESA and TCO'92 standards.

£215 £252.63 inc VAT



PanaSync 5G (TX-D1734)

17" Digital Chassis, 16" viewing area, 0.27mm dot pitch, 1024 x 768 @ 85Hz, max 1280 x 1024, 5 language On Screen Display, Power Saving, Energy Star and TCO'92 compliant.

£385 £452.38 inc VAT

PanaSync 4G (TX-T1563)

15" Digital Chassis, 0.27mm dot pitch

£249 £292.58 inc VAT

PanaSync/Pro 5G (TX-D1753)

17" Digital Chassis, 0.27mm dot pitch

£499 £586.33 inc VAT

PanaSync/Pro 7G (TX-D2162)

21" Digital Chassis, 0.25mm dot pitch

£1049 £1232.58 inc VAT

PanaSync 15MM and 17MM (TX-D1562F & TX-D1734F)

15" Digital Chassis / 17" Digital Chassis

15MM £285 £334.88 inc VAT

17MM £465 £546.38 inc VAT

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PRINTING IN STYLE WITH EPSON

NEW

Epson - the first name in business printing - is renowned the world over for the quality of its products and services. Epson printers aim to fulfil all of your requirements, whether it be mono, colour or both. Compact, high-speed and super-sharp with photo real quality included. Epson printers offer unbeatable value for both home and office users.

EPSON Stylus Color 400

Low cost easy to use advanced 720 dpi colour printer

Photo-real output at 720 dpi without any additional options

The Epson Stylus Color 400 is a high quality inkjet printer providing 720 x 720 dpi photo-real output with the addition of some new and exciting enhancements. It is the ideal printer to provide superb 720 dpi results for the home user for both business and personal documents, on all types of paper including plain paper.

- 720 dpi printing in colour & mono with Epson MicroDot™
- Photo Real Colour & Laser Sharp Mono Printing as standard
- Up to 3ppm Colour, 4ppm Mono printing on plain paper
- 1 year RTB warranty with optional 3 year on-site warranty
- Epson CoverPlus three year extended warranty service available - £65

£161
£189.18 inc VAT
Epson CoverPlus - £65



FREE
'Look Your Best Color Pak'
software bundle for PC, includes
designs, fonts & images

EPSON

COVER plus

Epson CoverPlus is a new extended warranty service designed to offer a flexible and comprehensive service for all Epson printers, scanners and video projectors. It gives customers the option with the product to cover them for extra entitlement should their product develop any fault.

Peace of mind through reliability.

- 3 year extended warranty service available on all Epson printers, scanners and video projectors.
- Flexible cover - 4 or 8 hour 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

EPSON Stylus Color 600



1440dpi colour & true black printing

Photo-Real colour
Outstanding value for the home or office

The Ideal printer to provide brilliant 1440dpi results for in-house desktop publishing, presentation graphics and other business and personal documents, on all types of paper, including plain paper.

- Photo-Real colour as standard
- Up to 4ppm colour 6ppm mono printing
- Advanced dual ink cartridge system with Epson Quick Dry Ink.
- Optimised printing of video/digital camera images
- 1 year RTB warranty with optional 3 year on-site warranty

£207
£243.23 inc VAT

Epson CoverPlus - £65

EPSON Stylus Color 800



Ultra fast - up to 8ppm mono & 7ppm colour

1440dpi printing

The colour printer for the professional

The Stylus Color 800 combines all the award winning features of the Stylus range with some new and exciting enhancements.

- Photo-Real colour as standard
- High capacity dual ink cartridge system
- Optimised printing of video/digital camera images
- Optional Postscript & network capability
- 1 year RTB warranty with optional 3 year on-site warranty

£320
£376 inc VAT

Epson CoverPlus - £65

EPSON EPL-N1200 & EPL-N2000

NEW Low cost high performance work group laser printers

EPL-N1200

- 12 pages per minute
- True 600 x 600 dpi with BIRITech
- 2Mb RAM with MITech
- 250 Sheet Multi-purpose Tray
- 2 x Hi Speed Bi-directional Parallel Interfaces
- Additional slot for optional Ethernet Interface

Epson CoverPlus - £149
3 year on-site warranty

EPL-N2000

- 20 pages per minute
- True 600 x 600 dpi with BIRITech
- 4Mb RAM upgradable to 64Mb
- A3+ Full bleed paper size
- 2 x Hi Speed Bi-directional Parallel Interfaces
- Ethernet network interface

Epson CoverPlus - £259
3 year on-site warranty
(8 hour response)



EPL-N1200 Standard configuration	£839	(£985.83 inc VAT)
EPL-N1200En Ethernet configuration	£1095	(£1286.63 inc VAT)
EPL-N1200Ps Postscript configuration	£1333	(£1566.28 inc VAT)
EPL-N2000 Standard network ready	£1500	(£1762.50 inc VAT)
EPL-N2000Ps Postscript configuration	£1900	(£2232.50 inc VAT)

EPSON EPL-5500

The little BIG laser from Epson

The Ultra-compact, True 600 x 600dpi, HP CL5e, high speed business laser, loaded with a powerful RISC processor. With HP PCL5e and 1Mb of memory, and delivers high resolution 600 dpi output at 6ppm, the EPL-5500 offers professional performance standards. It's the ideal laser for use in businesses large and small.

Just half the size of other conventional lasers, the EPL-5500 is compact enough for any desktop.

- World's most compact 6ppm Laser - 5Kg, small footprint
- True 600 x 600dpi - with BIRITech and MicroGray Technology
- HP PCL5e, GL2 - Optional PostScript, Epson FX and LQ, IBM, WPS emulations
- 1Mb (upg. to 32Mb) - with Epson's Memory Improvement Technology
- SparcLite 22.5 MHz RISC CPU - very fast printing
- 150 Sheet Paper Tray - Optional 250 Sheet Paper tray available

Epson CoverPlus - £99



1Mb	£328	(£385.40 inc VAT)
2Mb	£369	(£433.58 inc VAT)
5Mb PS	£655	(£769.63 inc VAT)
5500W	£245	(£287.88 inc VAT)

Windows printing system

For ordering information, please see page 2



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PRINTERS AND ACCESSORIES

brother
More than just features

HL-730

The new HL-730 from Brother is the low cost solution for your printing needs - flexible, high print quality at an affordable price. The HL-730 offers compatibility within various computing environments.

- 6ppm engine speed
- Straight Paper Path Technology
- Easy to set up and use
- 200 sheet adjustable paper tray



£259
£304.33 inc VAT

HL-760

- True 1200 x 600 dpi resolution
- Enhanced memory management technology
- Network connectivity
- Sleep mode

£314
£368.96 inc VAT

HL-1060

Brother's new mid range laser printer offers 10ppm print speed with the added benefit of fast 600dpi output. The HL-1060 gives superb print quality and versatile paper handling, with dual bin as standard.

- 10ppm engine speed
- Resolution - 1200dpi x 600dpi
- 2 built-in paper bins - 200 sheets in each
- Memory 2Mb - Expandable to 34Mb



- Emulation - PCL5e, Epson and IBM
- Auto sleep mode
- Warm up time - less than 30 seconds

£516
£606.30 inc VAT

HL-1260e

Incorporating Brother's own high speed 12ppm engine and 1200dpi, the Brother HL-1260e delivers superb quality output with stunning graphic and text reproduction, for professional documentation.

- PCL5e/BR-Script
- True 1200 x 600 dpi
- 650 sheet paper input
- 2Mb memory upgrade to 66Mb



£807
£948.23 inc VAT

HL-1660

Brother's new 16 page per minute workgroup laser printer with true 1200dpi and 4Mb RAM as standard. Featuring Brother's printing solution for Windows, plus true PCL5e, HPGL, Epson and IBM emulations for non-Windows applications.

£959
£1126.83 inc VAT

LASER PRINTERS

Brother MFC-6000 Laser/Fax	6ppm	•	£670
Brother HL730-GDI	6ppm	•	£259
Brother HL760-GDI	6ppm	•	£314
Brother HL1260E	12ppm	•	£807
Brother HL1060 New	10ppm	•	£516
Brother HL1160 New	16ppm	•	£959
Canon LBP1260+	12ppm	†	£829
Canon LBP465			£224
Epson EPL5500W-GDI	6ppm	•	£245
Epson EPL5500 1Mb	5ppm	•	£328
Epson EPL5500 2Mb	5ppm	•	£369
Epson EPL5500 PS 5Mb	5ppm	•	£655
Epson EPL9000 PS	8ppm	•	£1,315
HP LaserJet 4V	16ppm	•	£1,299
HP LaserJet 5L	4ppm	•	£269
HP LaserJet 5	12ppm	•	£825
HP LaserJet 5N	12ppm	•	£970
HP LaserJet 5M	12ppm	•	£1,111
HP LaserJet 4MV	16ppm	•	£1,865
HP LaserJet 5Si	24ppm	•	£1,824
HP LaserJet 5Si MX	24ppm	•	£2,496
HP LaserJet 5 Colour	10ppm	•	£4,095
HP LaserJet 5M Colour	10ppm	•	£5,045
HP LaserJet 6P	4ppm	•	£448
HP LaserJet 6MP	4ppm	•	£555
Kyocera FS400 1 Bin	4ppm	•	£308
Kyocera FS400 2 Bin	4ppm	•	£432
Kyocera FS1550	10ppm	•	£789
Kyocera FS1600	10ppm	•	£939
Kyocera FS1700 New	12ppm	•	£899
Kyocera FS3700 New	10ppm	•	£1185
Kyocera FS3400		•	£1,150
Lexmark Optra E Model A	6ppm	†	£332
Lexmark Optra R+ 4Mb	16ppm	†	£899
Lexmark Optra C	12/3ppm	†	£4,659
NEC SuperScript 860	6ppm	•	£310
NEC SuperScript 3000 Colour		•	£650
Oki Page 4W	4ppm	•	£165
Oki Page 16N	16ppm	†	£758
Oki OL600ex	6ppm	•	£237
Oki OL610ex	6ppm	•	£288
Oki OL810ex	8ppm	•	£408
Oki PAGE 16N	16ppm	•	£758
Panasonic KXP4430	5ppm	††	£439
Panasonic KXP4440	10ppm	††	£665
Panasonic KXP6100	5ppm	†	£185
Panasonic KXP6150	6ppm	†	£281
Panasonic KXP6300	6ppm	†	£225
Panasonic KXP6500	6ppm	†	£303

LASER RAM UPGRADES

Type	1M	2M	4M	8M
HP LaserJet 4/4M/4P/4MP	-	-	£79	£99
HP LaserJet 4L	£49	-	-	-
HP LaserJet 5L	-	-	£85	-
HP LaserJet 5/5M/5MP/6P/6MP	-	-	£75	-
Panasonic KXP4410/4430	£99	£199	-	-
Panasonic KXP4400/5400	£75	£110	£165	-
Oki OL400e	£108	£118	-	-

LASER CONSUMABLES

Type	Toner	Drum	Dev
Brother			
HL600 Series	£21	£99	-
HL730/760	£19	-	-
HL1260(Toner & Drum)	-	£92	-
Canon			
LBP4	£49	-	-
LBP8	£46	-	-
Epson EPL			
4000 Series	£75	£117	-
5200	£89	-	-
5100	£39	-	-
7100/7500/8100	£147	-	-
HP			
HP III/4Si	£75	-	-
HP 4/4+/4M+	£65	-	-
HP 4L/ML/P/4MP	£43	-	-
4V/4MV	£91	-	-
5L	£39	-	-
5P/5MP	£50	-	-
Kyocera FS400	£15	-	-
NEC			
610	£75	✓	-
860	£89	-	-
S60/62/90	£117	-	-
OKI			
OL400/800	£19	£165	-
OL400e	£17	£129	-
4W	£14	-	-
Panasonic KXP			
4410/4430	£28	£98	£98
4450/4451/4455	£20	£75	£60
4420	£23	£57	£57
4400/5400	£9	£55	-
6100/6150	£11	£98	-
6300/6500	£13.50	-	-
Qume			
Crystalprint	£108	£149	-
Star			
LS5	£68	-	-
LS5/WinType	£68	-	-

LASER ACCESSORIES

HP LaserJet 4 Lower Paper Cassette		£199
HP LaserJet 4 JetDirect Ethernet Card		£339
Panasonic KXP4420 Ozone Filter		£9
Panasonic KXP4450/4455 Ozone Filter		£20

9 PIN MATRIX PRINTERS

Citizen 120D+ Parallel	80col	£98	
Citizen 120D+ Serial	80col	£109	
Epson LX300	80col	£92	
Epson LX1050+	132col	£178	
Epson FX870	80col	£234	
Epson FX2170	132col	£369	
Panasonic KXP1150	80col	£87	
Panasonic KXP3696	132col	†	£255
Panasonic KXP3200	330cps		£169

24 PIN MATRIX PRINTERS

Citizen ABC Mono	80col	£99	
Citizen ABC Colour	80col	£120	
Epson LQ100+	80col	£82	
Epson LQ300	80col	£109.50	
Epson LQ570+	80col	£206	
Epson LQ870	80col	£365	
Epson LQ2070 NEW	132col	£318	
Epson LQ2170	132col	£465	
Epson DLQ3000	132col	£774	
Panasonic KXP2023	80col	£108	
Panasonic KXP2124	80col	£189	
Panasonic KXP2135 Colour	80col	£122	
Panasonic KXP3626	132col	†	£255

INK JET PRINTERS

Canon BJ30 White	80col	£124
Canon BJ230	132col	£228
Canon BJC240 COLOUR NEW	80col	£148
Canon BJ330	132col	£386
Canon BJC70 White	80col	£142
Canon BJC620 NEW	80col	£265
Canon BJC4550 NEW	132col	£273
Canon BJC4200 NEW	80col	£192
Canon BJC820	80col	£1,195
Citizen Printiva 600C	80col	£286
Epson Stylus 200	80col	£101
Epson Stylus 200 Colour	80col	£128
Epson Stylus 600	80col	£225
Epson Stylus 800	80col	£304
Epson Stylus 1000	132col	£319
Epson Stylus Colour 500	80col	£188
Epson Stylus 1500	132col	£499
Epson Stylus Pro A4	80col	£292
Epson Stylus Pro XL	132col	£785
HP DeskJet 400 COLOUR	80col	£115
HP DeskJet 340 COLOUR NEW	80col	£136
HP DeskJet 690 COLOUR NEW	80col	£191
HP DeskJet 693 COLOUR NEW	80col	£199
HP DeskJet 820 Colour	80col	£215
HP DeskJet 870 Colour	80col	£301
HP DeskJet 1600 Colour	80col	£825
HP DeskJet 1600M Colour	80col	£1,212
HP OfficeJet 350		£466
HP CopyJet M	80col	£889
Lexmark WinWriter 2070	80col	£280
Lexmark 2050 Colourjet		£207
Oki OJ2010 Colour	80col	£199

CUT SHEET FEEDERS

Canon BJ10ex/sx CSF Black	£40
Canon BJ10ex/sx CSF White	£40
Canon BJ300 CSF	£86
Canon BJ330 CSF	£96
Epson LX400 CSF	£69
Epson LQ570+/LQ870/300 CSF	£47
Epson LQ1070+/LQ1170 CSF	£89
Panasonic KXP1170/1180/1123 CSF	£59
Panasonic KXP2135 CSF	£30
HP DJ1600 OPT 500 Sht Paper Tray	£99

ACCESSORIES

Canon		
BJC30/70 Battery Pack & Adapter		£47
Epson		
LQ100 Tractor		£27.50
LX300 Colour Kit		£29
Stylus 820/1500 Colour Kit		£29
HP		
DJ 320/340 Battery Pack		£29
DJ 320/340 Colour Kit		£28
DJ 600 Colour Kit		£29
DJ 690 Photo Colour Kit		£39

Warranty Key

* 1 year back to base. † 1 year on-site. †† 3 year on-site.

PRINTERS AND ACCESSORIES

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RIBBONS & INK CARTRIDGES

	Black	Colour
Canon BJ10ex/BJ10sx	£13	-
Canon BJ200/BJ230	£15	-
Fluorescent Ink Cartridges		
BJC240	£24	-
BJC4200/4550	£29	-
Photo Ink Cartridges		
BJC240	£24	-
BJC4100/4200/4550 BC20	£27	-
Canon BJ300/BJ330	£11	-
Canon BJC30/70	£25	£27
Canon BJC600	£8	£6.50
Canon BJC800	£14	£18
Canon BJC4000 ink tank	£7	£13
Citizen 120+ Black Ribbon	£4	-
Citizen Swift 24/200/240/ABC	£4	£11
Citizen Swift 24X	£8	£16
Epson LX100	£4.45	-
Epson LX400/850/FX850	£3.95	-
Epson LX1050/FX1170	£4.95	-
Epson LQ100	£5.35	-
Epson LQ150	£5.35	£15.25
Epson LQ570/870	£4.50	-
Epson LQ1070/1170	£5.40	-
Epson LQ2550	£8	£16.20
Epson SQ870/1170	£20	-
Epson Stylus Colour	£11	£23
Epson Stylus Colour 820/II/Is	£13.95	£19.80
Epson Stylus 800/1000	£9	-
Fujitsu B100/B200	£18	-

HP DeskJet 500 Series	£16	£21
HP DeskJet 600/660	£19	£20
HP DeskJet 820/850/870	£20	£18
HP DeskJet 1200	£19	£21
HP DeskJet 1600	£19	£23
HP PaintJet XL300	£16	£18
Kaga KP810	£5	-
Lexmark 150C/1020	£21	£26
Lexmark 2050	£23	£27
Lexmark 2070	£24	£26
NEC P3Q/P32Q	£8	-
NEC P62/P72/P90	£8	£14
Panasonic KXP1150/1170/1180	£7	-
Panasonic 2180/2123/2124/2135	£7	£14
Panasonic KXP1624/2624	£8	-
Panasonic KXP3696/3626	£11	-
Panasonic KXP3200	£12.50	-
Star LC10/LC20/LC100	£5	£9
Star LC200	£5	£11
Star LC24-200/XB24-200	£5	£12
Star LC24-30	£8	£12
Star SJ144	£6	£8

PRINTERS SHARERS/BUFFERS

Manual Printer Sharers		
2in/1out Parallel	£13	-
2in/2out Parallel	£29	-
3in/1out Parallel	£17	-
4in/1out Parallel	£26	-

All of the above have 36 way Centronics Female Connectors

2in/1out Serial	£12	-
2in/2out Serial	£28	-
3in/1out Serial	£15	-
4in/1out Serial	£24	-

All of the above have 25 way Female D'Connectors

Auto Parallel Printer Sharer Buffers		
2in/1out	£29	-
2in/2out 256K Buffer	£105	-
2in/2out 1Mb Buffer	£134	-
4in/1out	£45	-
4in/2out	£69	-
4in/2out 256K Buffer	£124	-
4in/2out 1Mb Buffer	£149	-
8in/1out OK	£79	-

All of the above have 25 way Female D'Connectors

Auto Serial Printer Sharer Buffers		
2in/1out OK	£27	-
2in/2out 256K	£124	-
4in/1out OK	£44	-
4in/2out OK	£69	-
8in/1out OK	£62	-

All of the above have 25 way Female D-Connectors - INPUT & 25 way Male D'Connectors - OUTPUT

LUTON STORE

Finway, Dallow Road, Luton, Beds
Tel: 01582 745555

WATFORD STORE

250 Lower High Street, Watford, Herts
Tel: 01923 237774

RAM Expansion Cards		
256K Expansion Card		£59
1Mb Expansion Card		£78
2Mb Expansion Card		£124
Pocket Buffers		
256K Parallel Flash Buffer		£65
1Mb Parallel Flash Buffer		£98
2Mb Parallel Flash Buffer		£119
256K Parallel Turbo Flash Buffer		£85
1Mb Parallel Turbo Flash Buffer		£125
2Mb Parallel Turbo Flash Buffer		£158
All of the above have 36 way Female D'Connectors		
256K Serial Plotter Buffer		£155
1Mb Serial Plotter Buffer		£184
2Mb Serial Plotter Buffer		£330
All of the above have 25 way Female D'Connector		

COMPACT PRINTER CONVERTERS

Converts serial printers to parallel and vice versa by simply plugging the unit in to the data socket

Serial to Parallel Converter	£49
Serial to Parallel Converter with 256K Buffer	£55
IEEE488 to Centronics Converter	£49
RS232 to RS422 Converter	£37
Parallel Line Extender	£37

PRINTER LEADS

	1.8m	5m	10m
PC Parallel - 18 wire	£4	£8	£13
PC Enhanced Parallel - 25 wire	£5	£10	£15
25 Male 'D' to 25 Male 'D'	£4	£8	£13
25 Male 'D' to 25 Female 'D'	£5	£9	£14
Centronics Male to Centronics Male	£8	£10	£15
BBC Parallel	£2	-	-

PAPER & TRANSPARENCIES

A4 80g White Laser Paper - 500 sheets	£3
A4 90g Super White Laser Paper - 500 sheets	£5
A4 70g Fanfold Paper - 1000 sheets	£9
A4 70g Fanfold Paper - 2000 sheets	£15
9.5"x11" Fanfold Paper - 1000 sheets	£6
9.5"x11" Fanfold Paper - 2000 sheets	£11
14.5"x11" Fanfold Paper - 1000 sheets	£8
14.5"x11" Fanfold Paper - 2000 sheets	£14
A4 DeskJet Transparencies - 50 sheets	£35
A4 DeskJet special coated Paper - 200 sheets	£15
A4 360dpi Stylus Coated Paper - 100 sheets	£9
A4 720dpi Stylus Coated Paper - 100 sheets	£10.50
A3 BJC4550 High Gloss Film - 20 Sheets	£39
A3 BJC4550 Print Film - 20 Sheets	£48
A3 BJC4550 Coated Paper - 20 Sheets	£29

LABELS

89 x 36mm Single Row Fanfold Labels - 1000	£4.50
89 x 36mm Twin Row Fanfold Labels - 1000	£4.80
89 x 49mm Twin Row Fanfold Labels - 1000	£4.95
102 x 36mm Twin Row Fanfold Labels - 1000	£4.70
70 x 37mm A4 Laser Labels - 2400	£15.25

HP ON-SITE WARRANTIES

1yr Mono DeskJet 400/690C/693/340C	£32
3yr Mono DeskJet 400/690C/693/340C	£40
1yr Colour DeskJet 870, ScanJet 4S/4P	£45
3yr Colour DeskJet 870, ScanJet 4S/4P	£65
3yr LaserJet 5L	£110
3yr LaserJet 4V/4MV	£200
3yr LaserJet 5/5M/6P/6MP	£180

3 YEAR EPSON ON-SITE WARRANTY PACKS

LQ100/Stylus 820/IIIS	£40
LX300/1050/LQ300/Stylus IIC/Pro/500/ GT300/500	£65
FX870/1170/LQ570+/870/1070+/ Stylus 1000/EPL5500/W	£99
FX2170/LQ2170/GT8500/9000	£149
DFX5000+/DLQ3000/Stylus1500	£199
DFX8000/Stylus Pro XL/EPL9000	£259

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Color JetPrinter

Multimedia Printer from the World's Fastest Growing Printer Company

Includes Lexmark Workshop CD

- Greeting Card Maker
- Certificate Maker
- Labels Unlimited
- Photo Impression
- T-Shirt Maker
- Comic Creator
- Video of Install Procedure



Colorjet 2050

- Up to 600 x 600 dpi - mono & colour
- Two cartridge design
- 5 PPM - Mono
- 2 PPM - Colour
- New Super Sharp Waterproof Ink
- Lexmark 'Colorfine 2' Windows driver
- 150 page sheet-feeder
- 1 year warranty



£207
£243.23 inc VAT

IMAGINE IT, PRINT IT

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Established 1972

HEWLETT PACKARD PRINTERS



101 ways to keep your young pups entertained...

The HP DeskJet 693C with PhotoREt through optional HP Photo Cartridge

Hewlett-Packard, Disney and PrintPaks™ have teamed together to create the HP Home Project Kit, featuring a software collection that's fun for the whole family. The kit is enclosed inside every HP DeskJet 693C printer box and includes Disney Interactive's 101 Dalmatians Print Studio CD-ROM, the Family Fun Kit CD-ROM by PrintPaks™ and an HP sample paper pack. It's a complete kit filled with exciting project ideas for all ages.

- Vivid colour and sharp black text on any media is produced with HP's exclusive RealLife Imaging system plus PhotoREt.
- For the ultimate in colour imaging just snap in the optional HP Photo Cartridge, to activate HP's exclusive PhotoResolution Enhancement technology. PhotoREt makes use of additional shades of ink and enables printing out of six colours, to provide more detail and pastel colours for an exceptional photo image quality.
- Optimises colour automatically with no trial and error.
- Memory: 512KB.
- Print speed:
Black/White: Up to 5 pages per minute.
Colour: Up to 1.7 pages per minute.
Photo: Up to 4 minutes per page (13cm-18cm photo)
- Media: Exceptional selection from plain and recycled paper, postcards, envelopes, labels and stickers to HP DeskJet Photo Paper, transparencies, labels, even banners and mirror printing for iron-on transfers.
- Paper capacity: 100 sheets
- Fonts: 30 True Type fonts.
- Print volume: Up to 1000 pages per month.
- Warranty: For peace of mind HP quality, durability and reliability plus 1 year warranty.

£197
£231.47 inc. VAT

The HP DeskJet 693C colour inkjet printer from Hewlett-Packard offers the ultimate in colour printing possibilities that is fun, versatile and easy to use, at a price you can afford. Disney Interactive's 101 Dalmatians Print Studio CD-ROM includes more than 200 colourful images of 101 Dalmatians, line art, whimsical and photo puppies for making stationery, place mats, book marks, certificates and many more exciting ideas. The PrintPaks™ Family Fun Kit CD-ROM is simple to use and is narrated by instructions from Max the Dog, enabling you to create magnets, window art and banners. There is also an HP sample pack containing HP Photo Paper and Bright White Paper for high quality printing.



HP has custom designed the HP DeskJet 693C, its HP Photo Cartridge and HP DeskJet Photo Paper to work together to achieve photo image quality.

HEWLETT PACKARD PRINTERS

HEWLETT
PACKARD
Authorised Reseller
Personal Computer
Products

Colour & Mono Laser Printers

HP Color LaserJet 5

A leap forward in colour laser printing



- 10ppm print speed mono, 2ppm colour
- 1200 dpi image print quality

With the needs of users and network administrators firmly in mind, Hewlett Packard has taken a leap forward in colour laser technology. The result is a new class of printer, providing exceptionally high quality colour and monochrome output, network compatibility, outstanding performance and low cost of ownership.

Colour output of remarkable quality. With HP Image Resolution Enhancement technology 1200 (HP Image REt 1200), based on precise toner blending and accurate colour control, the HP Color LaserJet 5 is able to create photorealistic images and millions of solid colours without compromising on text quality.

Network compatibility. With HP JetDirect cards for connectivity and HP JetAdmin software for ease of use and administration, the new printers are ideally suited to network environments.

Outstanding performance equipped with a 40 MHz RISC processor for faster return to application and designed for 30,000 page monthly duty cycles, the HP Color LaserJet 5 delivers quality and volume at speed, printing at 10 ppm for monochrome, and 2 to 3 ppm for colour.

£4129

£4851.58
inc. VAT

HP LaserJet 5Si

Departmental printers have never been simpler to use



- 24ppm print speed
- 600 dpi resolution
- 4MB standard RAM for HP LaserJet 5Si printer
- Enhanced PCL 5 (standard)
- Three standard input sources with combined capacity of 1,100 sheets

This new printer is a high-volume, high-quality machine with 24 pages-per-minute engines and true 600x 600 dpi. Combined with significantly enhanced paper handling features and options, it offers far greater convenience and ease of use than ever before.

User-friendly. Point and click control and monitoring of print jobs and the printer itself, reducing time consuming hassles for both end-user and network administrator.

Intelligent media handling. A comprehensive array of paper handling features and options, such as automatic paper size sensing, two sided printing, watermark and booklet printing, high-volume, upgradeable input and output capacity, addressable output bins and envelope feeder.

High speed. High quality. Designed for heavy throughput, the new printer features a 24ppm engine, a powerful 40 MHz RISC processor and true 600x600 dpi print resolution with 120 levels of grey.

C3166A HP LaserJet 5Si printer. Includes 4 Mbytes RAM, one IEEE 1284 ECP bi-directional parallel port, two HP MIO.

£1839

£2160.83
inc. VAT

HP SupportPack

PC Software Assist

What is the HP SupportPack PC Software Assist?

This HP SupportPack provides telephone assistance for usage problems on over 100 industry-leading, multivendor PC application software products - as well as the most popular PC operating systems such as Microsoft Windows '95.

What does the service offer?

- Quick connection to trained Hewlett-Packard software support specialists
- Usage assistance for over 100 industry-leading, multivendor PC application software products from companies like Microsoft & Lotus
- Choice of standard or extended coverage hours with 3 and 25 "incident" packages to suit your needs.

What Products are Covered?

Microsoft

MS Office
MS Windows 3.x & '95
MS Mail
MS Project Management

Lotus

SmartSuite
Lotus Notes
Lotus cc:Mail
Lotus 1-2-3

Others

dBase
Corel Presentation
Netscape Navigator
Reflection...and many more

H1453A	3 Incident Pack, Standard Hours	£59	£69.33 inc.VAT
H1452AA	3 Incident Pack, Extended Hours*	£75	£88.13 inc.VAT
H1455AA	25 Incident Pack, Standard Hours	£475	£558.13 inc.VAT
H1454AA	25 Incident Pack, Extended Hours*	£599	£703.83 inc.VAT

*Extended Hours 8am - 8pm, Monday - Friday and 10am - 4pm Saturday



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FAX: 01582 488588



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TV/STORAGE & CONTROLLERS

DON'T FORGET TO ASK FOR YOUR FREE CD SOFTWARE WHEN ORDERING

Video Highway TV

Turns Your Computer into a TV Instantly

Ever imagine watching your favorite TV programs on your PC and seeing your favorite stars come alive right in front of you with just a simple key stroke? It seems quite far fetched?! Well, the unlikely has finally become a reality!! With the new 8-bit Video Highway TV card, you are able to transform your ordinary PC monitor into an amazing flicker-free full-screen digital TV!!

- High quality digital video display
- Displays full screen digital motion video
- Brightness/Contrast/Saturation controls
- Colour resolution: 16 million colours
- Supports 1 x NTSC/PAL composite video input
- Provides text overlay for on-screen display
- Stereo audio input
- Stereo audio output
- Full volume control
- Easy switch between TV audio and external audio
- Easy to use keyboard controls
- No system RAM limitation
- Compatible with any sound card
- Compatible with any VGA card



Minimum System Requirements:

- IBM-compatible computer model 386 or higher
- MS Windows 3.1 or Windows 95
- One available 8-bit ISA slot
- Sound Card/A pair of active speakers
- 1 MB of free hard disk space

£79.95
(£93.94 inc VAT)

Exclusively from Watford Electronics

Grab IT!

Grab video images from any VCR, TV, camcorder into your PC

When capturing from a full motion video, it is not always easy to get the right picture at the right instance. AIMS Lab's unique user-interface gives you 6 frames to choose from at any one time. No frustration from getting the right image.

- Captures in 16.8 million stunning colours
- Uses AIMS Lab's proprietary full video capture hardware
- Unique CCIR601 video sampling technology
- Captures broadcast quality video
- Captures in YUV 4:2:2 video format
- Real-time Saturation, Contrast, Gamma, Brightness control
- Bundled with GrabIT user-friendly image capture software
- Bundled with PhotoMorph II image editing software
- Supports industry file formats such as: TIFF, TARGA, BMP, JPEG, PCX, etc.



System Requirements:

- Windows 95 or Windows 3.1
- Desktop/Notebook 386 or better
- 4 MB of RAM
- 4 MB of free hard disk space
- 640x480 16 colour or better (VGA)

Introductory Offer

~~£69~~ **£129**
RRP (£151.58 inc VAT)

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T4000es 8Gb External SCSI	£225

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FC-20 Fast Tape Controller	£44
TC-15 Fast Cont. with H'Ware Comp	£109
SK7 Windows Backup Software	£39

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Travan TR4	£22	T'van TR3 xtra 4.3Gb	£33
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2Gb Ditto Tape	3pk	£45	

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Workgroup Edition	£329
Enterprise Edition	£799
Cheyenne ARCserve v6.0 for Netware	
Enterprise Edition	£799
Cheyenne ARCSolo Software for Windows	£93
Cheyenne ARCSolo Software for DOS	£69

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EZFlyer 230 Mb External SCSI	£178
EZFlyer 230 Mb Cartridge	£19
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270Mb Cartridge	£39
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Syjet 1.3 Gb Internal SCSI+ 1 cartridge	£319
Syjet 1.3 Gb Parallel + 1 cartridge	£364
Syjet 1.3 Gb External SCSI + 1 cartridge	£344
Syjet cartridge	£64

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Maxit 540Mb Cartridge	£39

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PCI BUS

Enhanced IDE Controller	£16
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• 1505 Altra Total CD Kit	£34
• 1515 Altra Total Connect Kit	£54
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• 1542 Controller Kit - ISA*	£152
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• 2940AU PCI SCSI Controller Kit	£149
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*includes Cables & Software

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2.5Gb	10ms	£169
3.1Gb	10ms	£182
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Hitachi			
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DK223A-11	1.0Gb	10ms	£185
DK213A-14	1.4Gb	10ms	£255
DK213A-18	1.8Gb	10ms	£315
Seagate			
ST9816A 2.5"	810Mb	16ms	£245
Toshiba			
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M2949S	9.1Gb	10ms	£1155

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3391 7200rpm	9Gb	8.9ms	£1249

Quantum			
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FB Tempest	2.1Gb	10.5ms	£212
FB Tempest	3Gb	10.5ms	£295
Atlas	2.1Gb	9ms	£309
Atlas	4.5Gb	8ms	£589

Seagate			
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ST32155W Ultra	2.1Gb	10.5ms	£355
ST334371N Ultra	4.3Gb	8ms	£745
ST334371W Ultra	4.3Gb	8ms	£775
ST32151N 3.5"	2.1Gb	9ms	£287
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ST410800N 3.5"	9.09Gb	8ms	£1279

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WDS2100W	4.3Gb	8ms	£759

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Backer is a high performance PC back-up system designed specifically for the home user.

Backer can store up to 3 Gigabytes of data on a standard 3 hour video tape, comparable to conventional tape streamers costing over £300. Data transfer during archive, verify or restore runs up to 9 Megabytes per minute, out performing many of the more expensive tape streamers. Utilising low cost video tapes Backer can store an incredible 20MBytes per penny on each tape.

Backer can be used with any VCR or Camcorder that has both video in/out connections that can store a composite video signal. Low cost video tape is suitable for back-ups including 1, 2, 3 or 4 hour tapes.

Backer runs under Windows® 3.1, 3.11 or Windows® 95. During archiving Backer operates in the background allowing the user to continue working in other Windows® based applications.



Only **£34** £39.95 inc. VAT

Danmere



Removable Storage Made Easy

Insuring your data has never been easier

DITTO Backup Tape Drives

- Universal Travan Drive
- One-step backup
- Plug & go setup

Ditto tape drives makes backing up your stuff easier than it's ever been - without waiting! Backup, restore and copy with one easy step or customise your backup routine however you like. Ditto's 1-step backup sits right on your desktop and is ready whenever you are - what could be easier?



2Gb Internal
£95
£111.63 inc. VAT

2Gb Parallel Port
£129
£151.58 inc. VAT

ZIP DRIVE - 3 drives in one

- Expand your hard drive without limits (100Mb at a time)
- Take it with you (Zip drive & disks are portable)
- Insure your hard drive (fast and easy)

Increase your storage quickly, easily and economically - as you need it. With 100Mb Zip disks you can add as many disks as you need. The best way to move your information - Zip drive and disks are small, light and convenient. Zip drive weighs about 450g and fits easily in your hand, bag or briefcase.



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Includes 6 Zip Disk Pack worth £60

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Zip Mac SCSI **£107** £125.73 inc. VAT

Zip Drive only **£107** £125.73 inc. VAT

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JAZZ DRIVE - the ultimate choice in hard drives

- Faster than most hard drives (works as fast as you do!)
- Provides 1GB of disk space on each compact cartridge (enough to backup your entire hard drive!)
- Insure your hard drive (fast and easy)



Jazz Disk **£69** £81.08 inc. VAT

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For ordering information, please see page 2

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Prices exclude carriage & VAT @ 17.5% except where shown

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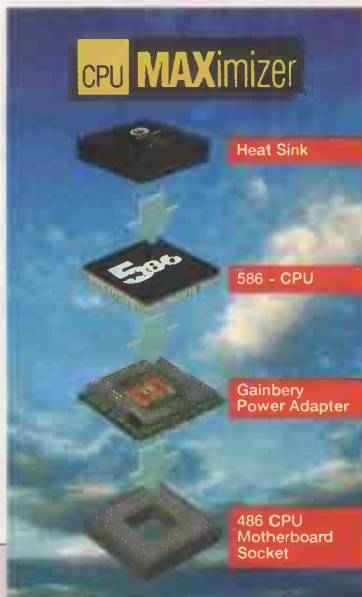
MEMORY AND PROCESSORS

DO YOU HATE TO WAIT

Convert your 486 System into a CPU MAXimiser Upgrade

Maximizer 586 Plug and Play module

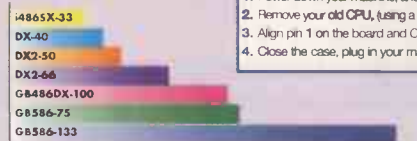
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Easy Installation:

1. Power down your machine, and yourself to the metal frame
2. Remove your old CPU, (using a CPU puller provided if necessary)
3. Align pin 1 on the board and CPU MAXimizer, plug it in firmly
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Gainbery Performance Benchmark Testing CPU MAXimizer



Landmark V2.0 (All CPU's running in same system)

Choose the 586 CPU MAXimizer that fits your system

CPU MAXimizer	PROCESSOR	YOUR CURRENT SYSTEM	EXT. CLOCK RATE	PRICE
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PRICES SLASHED

RAM Prices Constantly Change Please Call for Latest Prices

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2M x 36	8Mb		£37
4M x 36	16Mb		£74
8M x 36	32Mb		£148
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Converts 4x30pin SIMMS to 1x72pin SIMM. Can use 3 or 9 chip to give 32 or 36bit. Please specify FORWARD or REVERSE version

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Pentium P166 MMX			£269
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Pentium Overdrives - See advert

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- Equipped with Over Current Protection
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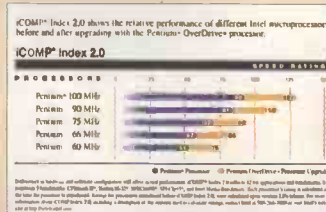
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pentium[®]
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EXTRA POWER

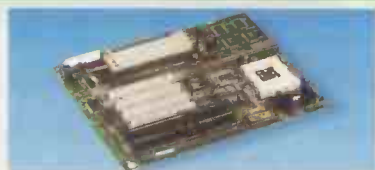
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Pentium P200 + M/B + Fan + 8Mb EDO	£449
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Pentium P133 + M/B + Fan + 16Mb EDO	£225
Pentium P150 + M/B + Fan + 16Mb EDO	£251
Pentium P166 + M/B + Fan + 16Mb EDO	£331
Pentium P200 + M/B + Fan + 16Mb EDO	£471
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Pentium P200 MMX + M/B + Fan + 8Mb EDO	£499
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Aries Perfecta Case



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AST

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KST800N/16	16Mb	501488-003	£149	KTD-GXPRO/64	64Mb	N/A	£825
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KST1392/8	8Mb	501392-002	£79				
KST1392/16	16Mb	501392-003	£149				

COMPAQ

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KTC1481/16	16Mb	148189-001	£135	KTM755/D16	16Mb	84G2153, 92G7257	£169
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KTC-E5000/32	32Mb	213515-003	£235				
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KTC-A4100/8	8Mb	217914-001	£72				
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KTT650/32	32Mb	PA2043U, NW2043U	£278
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KTT700/32	32Mb	NW2015U	£355
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DELL

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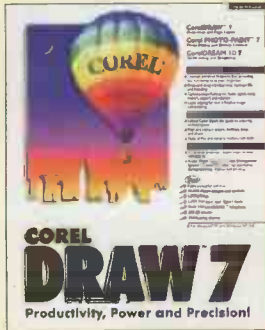
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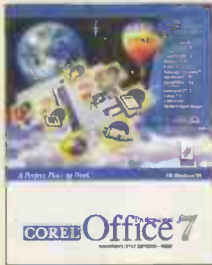
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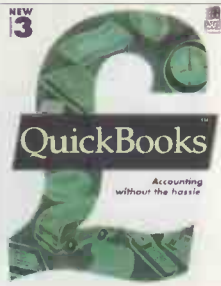
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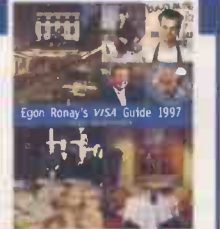
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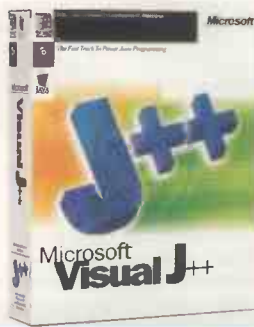
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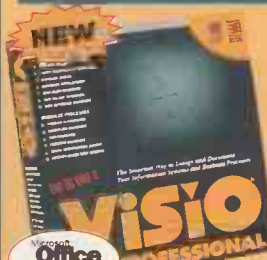
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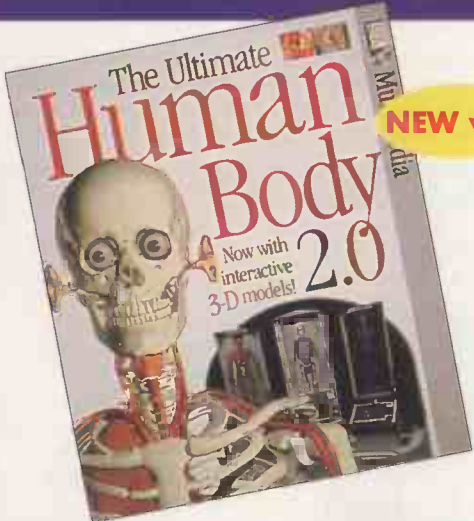


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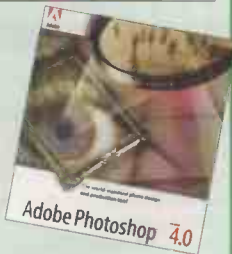


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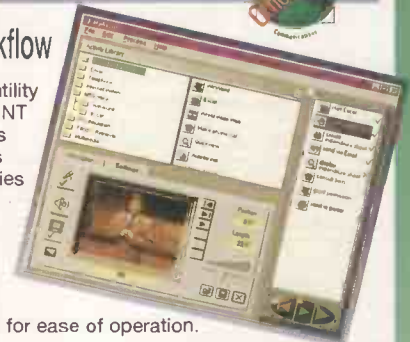
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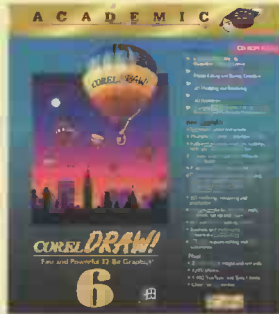
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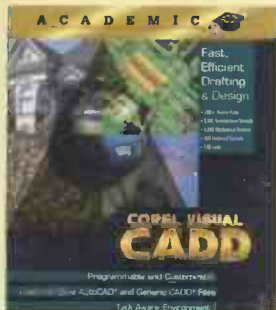
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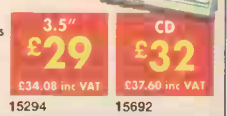
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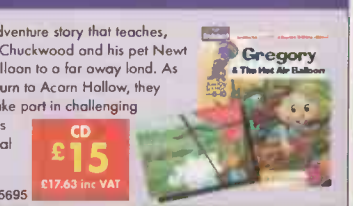
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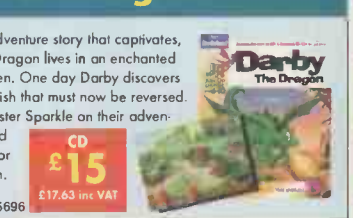
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15696

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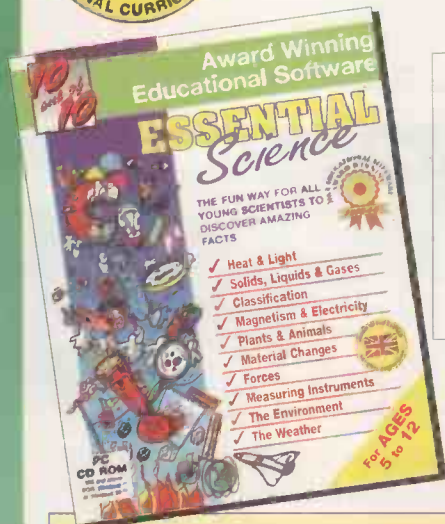
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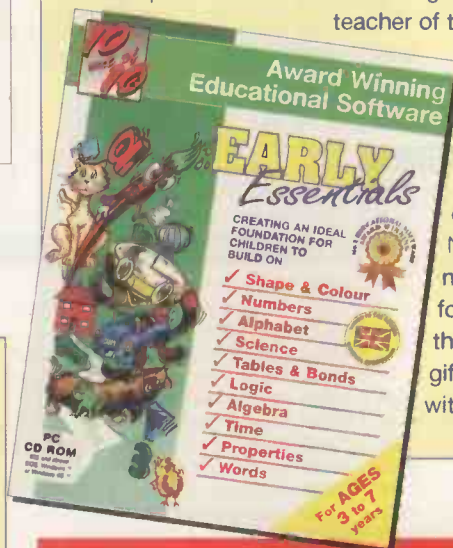
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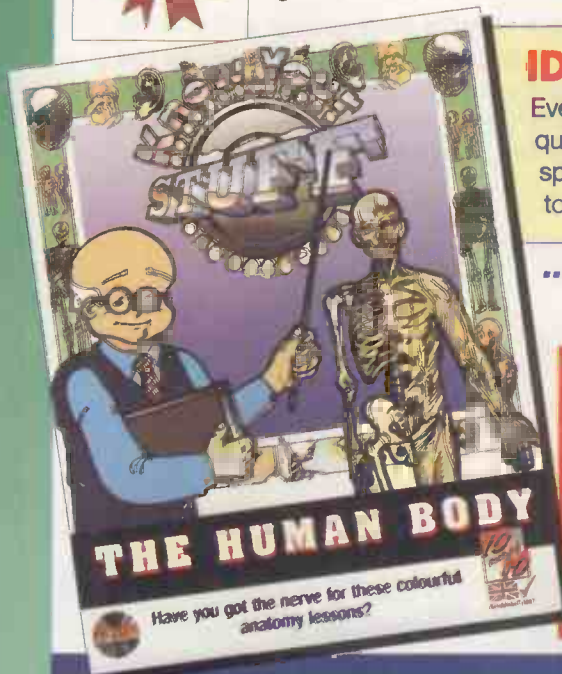
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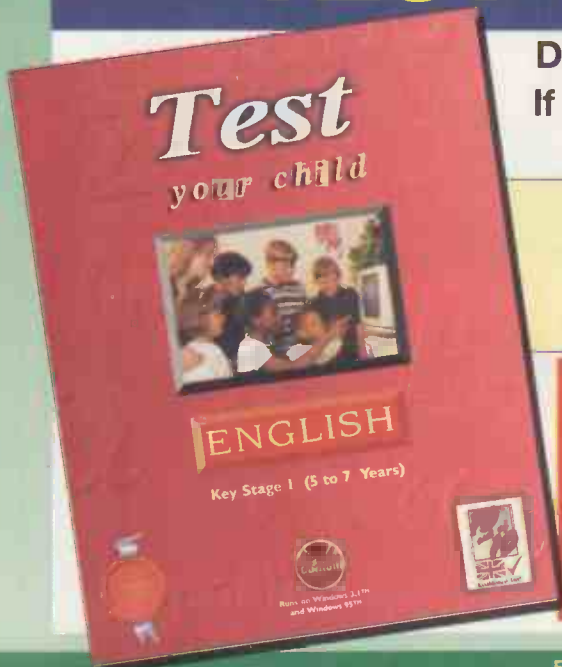
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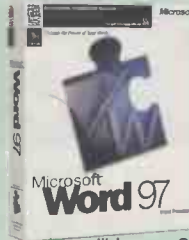
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The world's best-selling word processor is now better than ever

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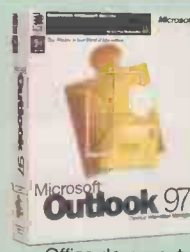
- Create dramatic presentations right away with PowerPoint® Central's links to learning aids and multimedia bits.
- Tailor the same presentation

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Microsoft OFFICE 97 PRO

Microsoft Office 97

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Microsoft® Office 97, the world's best-selling office suite, now with the power of the Web. Microsoft® Office 97, Professional Edition. Now for a limited time and a special price you can get Microsoft® Office 97 Professional Edition with Bookshelf® Basics and IntelliMouse™

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Upgrade with IntelliMouse
£225
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Microsoft IntelliMouse™

The IntelliMouse™ is similar to the popular Microsoft Mouse but now incorporates a wheel located between the two buttons to make navigating documents faster and easier. With the wheel, users can "zoom and scroll" within Office 97 applications, Microsoft Internet Explorer 3.0 and Windows 95. Functionality of the wheel is application dependent but is consistent across the Office suite.

Microsoft Access 97



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Microsoft Access 97 provides relational database power to give you the information you need to make better decisions. It integrates data from spreadsheets and other databases, shares information over intranets and the Internet and build faster business solutions. Corporate Web pages. Sales figures and invoices. Customer names and on the Internet. But how do you make sense of it all? The Microsoft Access 97 relational database management system structures your data so you can find answers easily, share timely information and build faster solutions that help you make better business decisions.

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Office Professional	16287 £419 £522.85 inc VAT	16288 £206 £242.85 inc VAT	16398 £408 £492.40 inc VAT
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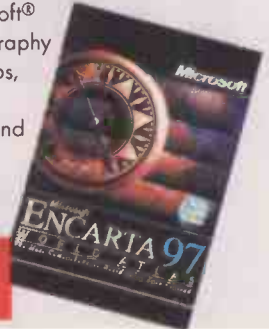
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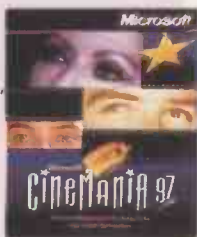
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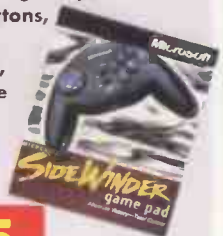
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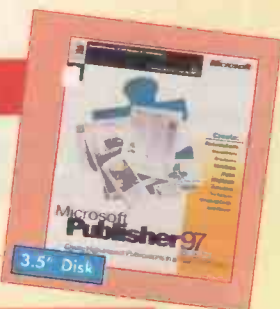


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System Requirements

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- Recommended 16MB RAM
- Windows 95, Windows 3.1 or above
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Speakers required for text-to-speech output



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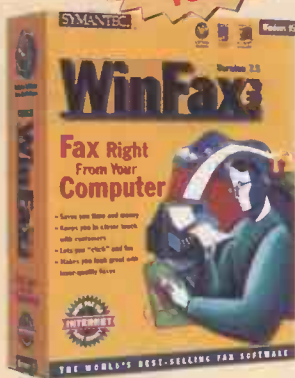
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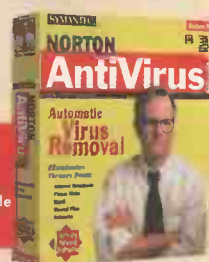
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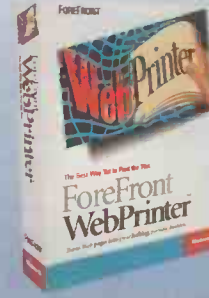
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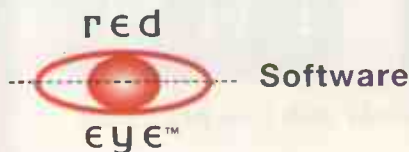
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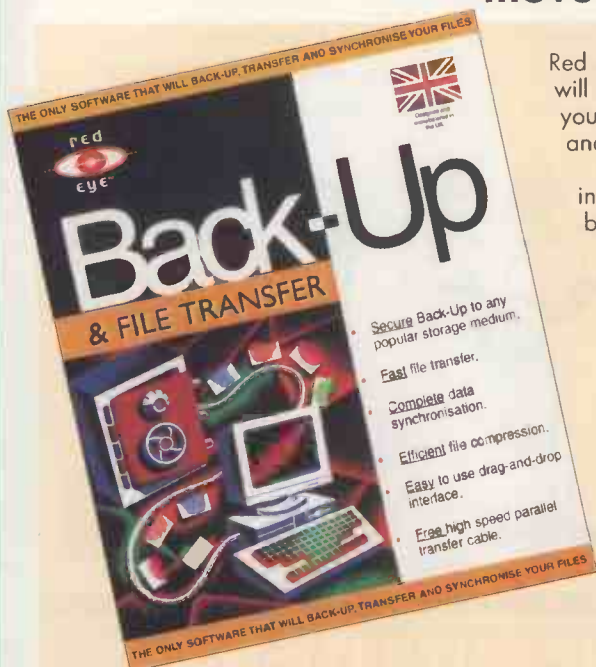
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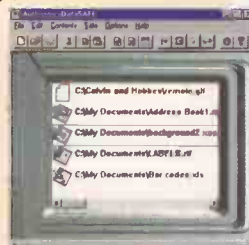
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This unique software can significantly reduce waiting time and can increase the speed at which you can view pages and links within a site, as well as when travelling from site to site. Just like adding a turbocharger to a car engine, adding Net Jet to a computer can result in dramatic surfing speed improvements.

Net.jet makes your modem usage up to 9 times more efficient.

Net Jet preloads links as you browse the Web. It anticipates which links you might click on next and loads them in the background as you read your current page. Peak Net Jet does this by utilising the unused modem bandwidth when the modem is idle during a surfing session. With Net Jet, modem capacity improves from a typical 11% per session to as high as 90%. And that translates into reduced waiting time during your Web browsing.

Intelligent features.

Peak Net Jet learns from your browsing habits. By recognising your favourite sites and those you visit most often, it refreshes these sites so they are always up to date in the Net Jet cache.

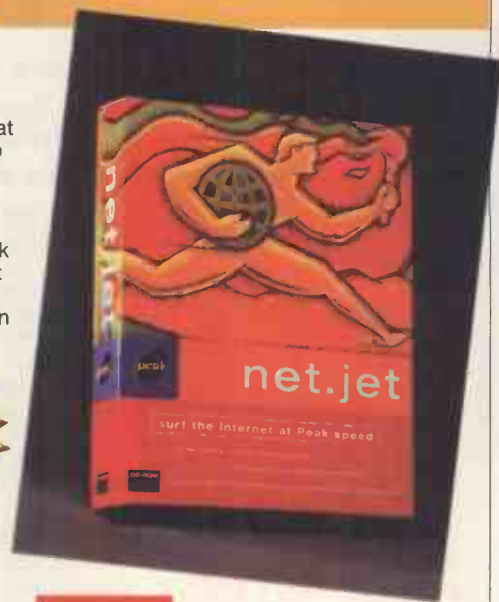
Easy to use

With Net Jet, you don't have to learn yet another piece of software. It installs easily and automatically and then runs in the background. Net Jet doesn't require you to change the way you browse the Web, it simply makes it faster.

Unique direct updater

Users can update Net Jet over the Internet as enhancements are developed, so you'll always have the most current version of Net Jet available.

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JOT-IT!

JOT-IT™ is the easy way to leave notes and reminders. Just drop a blank note from the JOT-IT! pad anywhere you want - on a spreadsheet, on a letter, or at a Web site. Then write your note or even record your voice.

From then on, your JOT-IT! note will be where you placed it...ready to remind you!

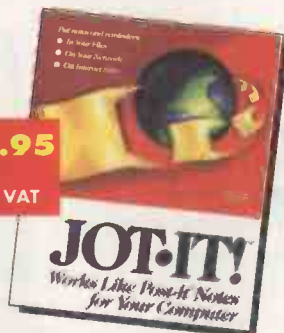
JOT-IT! Works great with all major word processing, spreadsheet and business applications - database, finance, project management, etc:

- Word®
- PowerPoint™
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Works like Post-It® Notes on your PC

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15151



JOT-IT! works seamlessly with these and countless other software applications or internet browsers on the market!

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Inso CORPORATION Quick View Plus!

Quick View Over 200 applications!

View over 200 file formats: Quick View Plus brings you the world's leading technology, letting you view over 200 different file formats. It's like having hundreds of applications inside your PC!

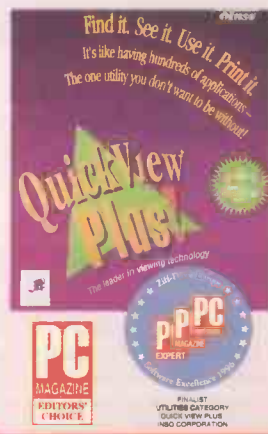
View internet files without downloading: look at Internet files before you download them, saving hours of wasted time and phone bills and saving your hard disk from unwanted clutter!

View .zip files without decompression: Quick View plus will look at .zip files from the inside out, letting you select files and view them without decompression, saving both time and disk space.

Print, copy and paste: Quickly print, copy and paste all or part of a file without opening or even having the application. New Quick View Plus 4.0 will even print files without viewing them first.

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IBM

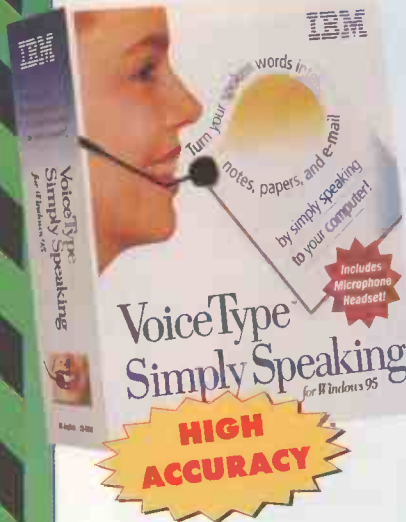
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Imagine simply speaking text faster than most people can type...

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The IBM VoiceType range of speech recognition products lead the industry in performance, accuracy and ease of use. There is a VoiceType product to suit every application from Simply Speaking for simple dictation at home to fully featured *VoiceType Dictation Solutions for business and professional applications.

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personal NAVIGATOR™



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So, what does Personal Navigator consist of?

Personal Navigator is supplied on CD-ROM ready for installation on your desktop PC or notebook computer.

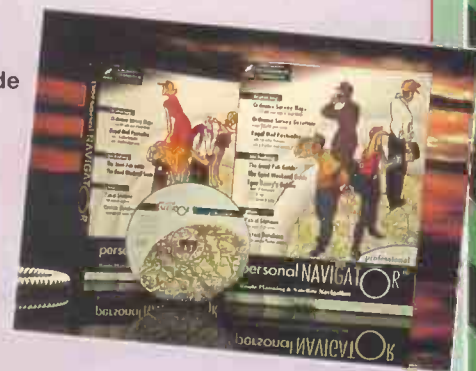
- Digital Maps
- The Good Pub Guide & The Good Weekend Guide
- Route Planning
- Postcode Database
- Custom Database
- Petrol Stations Database
- Gazetteer Database
- Egon Ronay's Guides*

*professional version only

System Requirements

- Personal computer with 486 or higher microprocessor; 8MB of memory (RAM); disk space requirement dependent upon components installed (most components can be run from the CD); CD-ROM drive; VGA or higher resolution monitor capable of displaying 256 simultaneous colours (512 recommended)
- Microsoft Windows® 95 or Windows NT™: please note product does not run on Windows 3.1 or earlier
- Microsoft Mouse or compatible pointing device
- GPS receiver for moving map and satellite navigation capability*

*professional version only



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Standard
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Professional
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SOFTWARE

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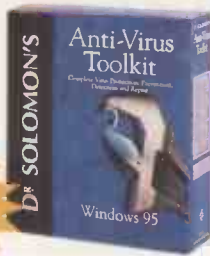
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Dr Solomon's Anti-Virus For Netware Server	11798	£239	£280.83 inc. VAT
Dr Solomon's Anti-Virus Toolkit for NT	11701	£72	£84.60 inc. VAT

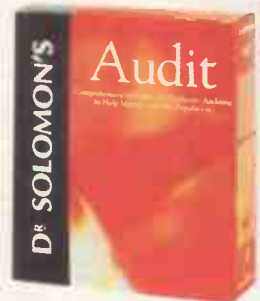
Comprehensive software and hardware auditing to help manage your PC population

Dr. Solomon's Audit is a comprehensive software & hardware audit package which assists you in maintaining control of your PC assets. As well as making the task of support very much simpler, it will also help to ensure that you keep within the terms of your software licences. It features ease of use together with speed of scanning and accuracy in software package and PC configuration identification - minimising disruption to end users.

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Dr. Solomon's Audit version 2.5 brings you the indispensable features of previous versions but also includes the following additional functionality:

- Improved Hardware Scanning
- Windows 95 Scanner (software & hardware)
- Window NT Scanner (software & hardware)
- Improved Windows 3.x/DOS Scanner
- Detection of packages using Windows property information
- Multiple search queries
- Compatibility with Microsoft SMS (System Management Server) i.e. the ability to export audit information to SMS



11809

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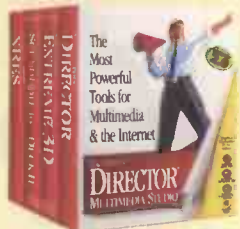
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The Most Powerful Tools for Multimedia & the Internet

Macromedia's Director Multimedia Studio offers the best products for the best price - everything you need to create professional multimedia projects from the ground up.

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- **Macromedia xRes** - The total creative tool for high-resolution image editing, natural texture painting and compositing. The perfect complement to Adobe Photoshop.
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The Most Powerful Design Tools For Print & Internet Graphics

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- **Macromedia Extreme 3D** - 3D modeling, animation and rendering. The most powerful 3D authoring tool for design, multimedia and the Internet.
- **Macromedia Fontographer** - Typeface creation and modification. Fontographer provides precision drawing tools that make font design as easy or as advanced as you need it to be.
- **Macromedia Shockwave** - Web graphics and on-line publishing. Shockwave makes true vector art on the Web a reality. Take existing artwork to the Web or create new vector and bitmap-based artwork.



Includes - 10,000 clip art images, 500 fonts, 500 FreeHand templates, 250 MB of high-resolution photographs, and dozens of 3D models.

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Visual dBASE combines leading edge visual tools with a flexible, yet easy, programming language - to deliver the most productive database solution for business professionals and application developers.

Now you can quickly create tables, forms, reports and labels with easy to use Two-Way-Tools™ that allows you to work the way you want to. Additionally, your database applications will run on both Windows 3.x and Windows 95 - Visual dBASE automatically senses the environment and adjusts its look and feel accordingly.

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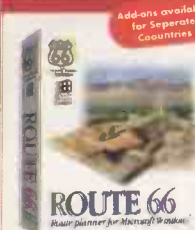
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- Easy-to-fill out on-screen cards
- Automatically creates ancestor and descendant trees
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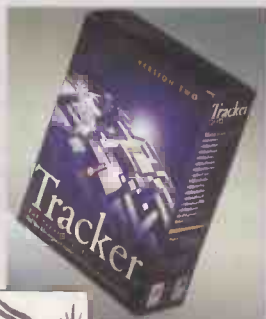
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The Clever Contact Manager

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with

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The Best Way to Scan, Organise and Use Your Colour Documents

Pagis Pro 97 from Xerox is the first full-featured scanning software to be completely integrated into the Windows 95/NT desktop. It allows you to capture, organise and use your colour documents and incorporate them easily into the Windows® Explorer file system.

Pagis Pro 97 brings together your paper and electronic worlds by allowing you to store, locate and use your documents with existing desktop applications.

With Pagis Pro, you can easily scan, copy, fax, find, print and drag-and-drop scanned documents to your preferred desktop applications. Scanning colour documents is a simple, one-touch operation that takes the guess work out of achieving quality results.



System Requirements
Windows 95 or Windows NT 4.0
Intel 486 or Pentium PC
VGA, SVGA or Multisync
colour monitor
16MB of RAM

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ModemShare™

One phone line, one modem for everyone in the office.

ModemShare enables businesses with mixed environments of Windows 95, Windows and DOS PCs to share phone lines and modems across a local area network. Instead of buying a modem and dedicating a phone line for each user, everyone on the network can use their favourite communications software and share modems and phone lines. This new and more powerful version of ModemShare makes it easy to fax, access the Internet and more, without ever leaving your desk.



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15297
2 PC Host & Viewer
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To combat these risks, MIS Europe - International Consultants in Computer Security and Data Protection - have developed a range of user-friendly, Windows-compatible, software security products, ideal for all users - at home or for any size business.



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16417	Ironwall	Prof Win95	£144

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Lotus Introducing SmartSuite 97

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SmartSuite 97 delivers a complete set of up-to-date, 32-bit applications specifically designed to take advantage of Windows 95 and Windows NT. Every application in the Suite includes a host of innovations and improvements designed to help users:

- Increase their individual productivity.
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The SmartSuite 97 team includes:



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1-2-3 97 is a completely rearchitected, 32-bit spreadsheet that delivers a host of new and enhanced capabilities to automate everyday tasks and simplify processes.

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- Team Computing tools enable users to share ideas and collaborate on work-in-progress.
- Built-in tools enable users to create custom solutions.
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Lotus Word Pro

Word Pro 97 provides users all the tools they need to quickly and easily create powerful, compelling, great-looking documents.

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- Word Pro's exceptional tools enable users to edit, format, organise and spell-check documents.
- Team Computing tools enable users to electronically share and collaborate on documents.
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Lotus Approach

Approach 97 leads the database world in delivering an unparalleled combination of ease-of-use and power

- Approach is a full-featured, relational database designed to cover the entire range of database tasks.
- Approach provides users more ways to tap into their existing information from SQL, DB2, or other large data sources.
- Approach provides more power to write custom applications using LotusScript and other popular programming tools.

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Lotus Freelance Graphics

Freelance Graphics 97 continues its long tradition of simplifying the creation and delivery of highly effective presentations.

- Includes valuable content suggestions, tools for outlining and diagramming and a wide variety of animations.
- Powerful TeamReview features and the Freelance Presentation Library gives users the tools they need to work together.
- Freelance Graphics offers remote ScreenShow capability and a wide range of output options.



Lotus ScreenCam

ScreenCam 97 is a fast, easy way for users to show what they mean when they can't be there in person. With ScreenCam, a PC acts as a VCR to record every on-screen click, scroll and action. Captions and sound can be added to create mini-movies, delivering marketing messages, on-line tutorials, or product demonstrations.



Lotus Organizer

- Enhanced calendar and notebook functions, as well as TAPI support, give users new time management tools.
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The major enhancements contained in cc:Mail Release 6.1 keeps your organisation communicating more efficiently than ever before.

Administrators will appreciate the more reliable and more scalable cc:Mail infrastructure. Management has never been easier. End users will appreciate the ability to automatically route electronic forms, organise meetings and communicate effortlessly across platforms.

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£116.33 inc VAT



Release 6.1 includes cc:Mail LAN, Mobile & Router. Lotus Organizer 2.21, Form Filler & Form Designer are now bundled with Lotus cc:Mail Release 6.1, making Lotus cc:Mail R6.1 the most complete enterprise wide communications system available.

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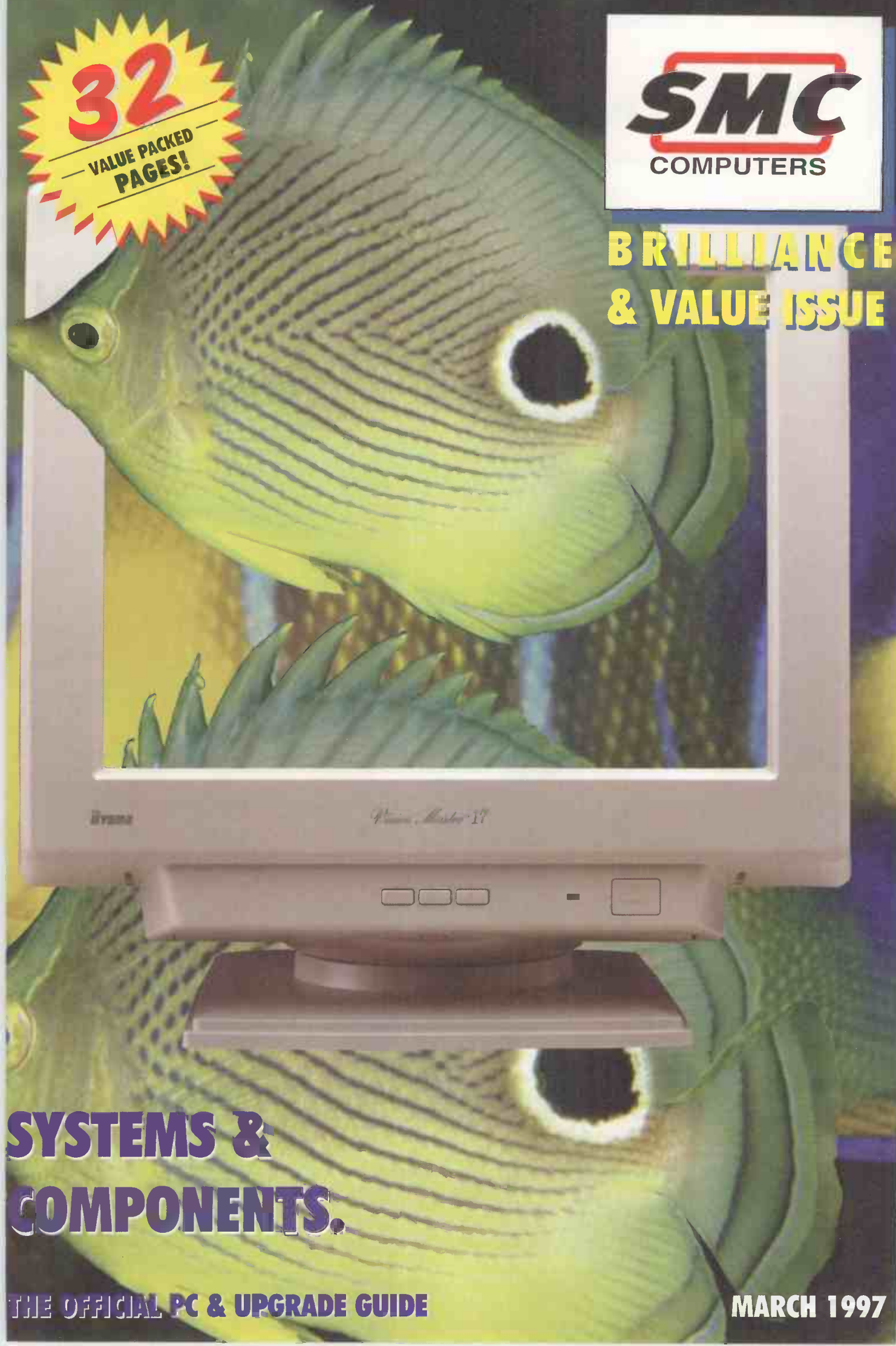


32

— VALUE PACKED
PAGES! —

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**BRILLIANCE
& VALUE ISSUE**



**SYSTEMS &
COMPONENTS.**

THE OFFICIAL PC & UPGRADE GUIDE

MARCH 1997



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This does not apply to PC systems, printers, software, made to order cables and carriage charges. E&OE. Prices and specifications subject to change without notice. Please ask our advice before ordering to avoid any foreseeable incompatibility problems. All trademarks acknowledged. SMC Computers PLC terms and conditions on request. This does not affect your statutory rights. Prices exclude delivery. Carriage charges are £5.50 for orders under £50, £8.50 for memory & CPU, and £12 for other products.

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It's Your Choice!

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We also pride ourselves on our efficiency and customers will normally collect their PC after only 4-5 working days. Shorter times can be achieved if required.

Don't sell yourself short, insist on the best. Insist on INFINITE.

CHOOSE YOUR MONITOR

To give you an even wider choice Infinite systems are listed without monitors. Select your preferred display from our range overleaf.

MULTIMEDIA OPTIONS

When configuring your INFINITE system don't forget the vast array of multimedia for professional and home entertainment applications.

PRINTERS & SCANNERS

We can offer a full range of printers and scanners to suit all budgets whether it's for the home or the office.

MEMORY OPTIONS

All Pentium systems now come with faster EDO memory as standard, and the minimum entry level has been raised from 4Mb to 8Mb as standard.

SOFTWARE CHOICES

We can offer a full range of System and Application software, including Multimedia titles to suit all configurations, whether it's for the home or the office.

Infinite



ON ALL SYSTEMS CHOOSE EITHER



WINDOWS 3.11
OR
WINDOWS 95

ALL SYSTEMS
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PIPELINE BURST CACHE

THIS IS STANDARD FITMENT. CHECK MEMORY
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In the home or office!

Absolute Beginner

Ex VAT **£766**
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To show we listen to our customers we have put together a system that is specially designed for those home users who are new to the world of computing. We have taken the components you asked for most in your entry level systems in the family environment.

- Pentium P133 Processor
- 16 Mb EDO RAM
- 1.2Gb EIDE Hard Drive
- Diamond 2Mb DRAM Graphics Card
- 8 x EIDE CDROM
- MS Mouse
- Soundblaster 16 bit Plun'n'Play Soundcard
- Yamaha 10 Watt Speakers
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- 3.5" Floppy Drive
- Windows'95 Software



FOR MONITOR OPTIONS SEE PAGE 7.



FOR MONITOR OPTIONS SEE PAGE 7.

Serious Gamer

Ex VAT **£1260**
Inc VAT £1480.50

Built for the real game player who knows how speed can make or break on some of today's and tomorrow's intensive games. We haven't held back as we know what it takes for a serious game machine. The 2Gb drive will hold many of the larger games, a 10x CDROM with 32bit sound card will make for brilliant effect, combined with the latest in graphical technology.

- Pentium P200 Processor
- 32Mb EDO RAM
- 2.0Gb EIDE Hard Drive
- Matrox Mystique 2Mb Graphics Card
- 10x EIDE CDROM
- MS Mouse
- Soundblaster AWE32+ PNP sound card
- Yamaha 10 Watt speakers
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- 3.5" FDD
- Dos/Windows 3.x or Windows'95
- See page 7 for monitor options

Family Multimedia

Ex VAT **£895**
Inc VAT £1051.63

A great place to start with the Pentium technology and equipped with the latest Matrox Mystique graphics card with EDO memory, making it faster than other 2Mb cards. Combined with an 8x CDROM player and 32bit sound card with Yamaha speakers, it is certain to keep the whole family entertained.

- Pentium P133 Processor
- 16 Mb EDO RAM
- 1.7Gb EIDE Hdd
- Matrox Mystique 2Mb WRAM graphics card
- 3.5" Floppy Drive
- 8 Speed EIDE CDROM Drive
- Soundblaster AWE32+ PNP Sound Card
- Yamaha 10 Watt Speakers
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- MS Mouse
- DOS/Windows 3.x or Windows'95



FOR MONITOR OPTIONS SEE PAGE 7.

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Choosing INFINITE will give you a system that is not only built to your specification, but which carries a brand that is now recognised to stand for high quality, high performance, reliability and full compatibility.



**BUY
= OF THE =
MONTH**

Win TV Ex VAT **£855**
Inc VAT **£1004.63**

The TV now really comes to your screen. With the latest Win/TV PCI card you can have TV, Teletext and cable TV all on your monitor. This P133 with 16Mb system is designed as a complete home or office PC with complete sound and graphics, while the TV picture can be viewed as an icon on the desktop or full screen for full viewing pleasure.

- Pentium P133 Processor
- 16Mb EDO RAM
- 1.2Gb EIDE hdd
- 8x speed CDROM drive
- Soundblaster 16bit PNP Sound Card
- Yamaha 10 Watt speakers
- DOS/Windows 3.x or Windows'95
- TV/TELETEXT Capture Card complete with 1Mb Accelerated Graphics
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- MS Mouse
- 3.5" Floppy Drive
- Monitor Options, See Page 7

Starting Blox

Ex VAT **£679**
Inc VAT **£797.83**

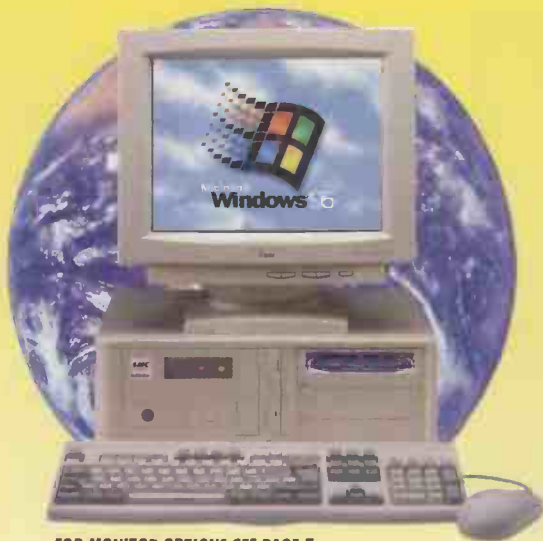
An ideal base to start from, with infinite choices and possibilities on which to build. Designed with room to expand in any direction, but powerful enough to tackle most applications as it stands. All the components from the Pentium P133 processor and 16Mb of EDO RAM coupled with accelerated graphics and an eight speed CDROM drive have been chosen for their compatibility as well as performance, ensuring expansion is effortless.

- Pentium P133 Processor
- 16 Mb EDO RAM
- 1.2Gb EIDE HDD
- 3.5" Floppy Drive
- 1Mb DRAM Graphics Card
- 8x EIDE CDROM
- Microsoft Mouse
- Desktop Case
- Windows'95
- 105 Win'95 Keyboard



FOR MONITOR OPTIONS SEE PAGE 7.

A FEW SAMPLES OF INFINITE SYSTEMS
SPECIFY YOUR OWN PC!..... See back page



FOR MONITOR OPTIONS SEE PAGE 7.

Windows Power + **Ex VAT £1111** Inc VAT £1305.43

A P166 with high ram for those who use database and spreadsheet programmes in Windows. With this highly intensive windows processing in mind, we have added a high spec graphics card to keep everything running smoothly. An 8 speed CDROM means loading software is easy and any amount of upgrades can be added.

- Pentium P166 Processor
- 32 Mb EDO RAM
- 1.6Gb EIDE Hard Drive
- 2Mb EDO graphics card
- 8 speed EIDE CDROM
- 3.5" Floppy Drive
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- MS Mouse
- DOS/Windows 3.x or Windows'95
- Monitor Options, See Page 7
- Triple Software Pack inc MS Encarta '96 and Grolier Encyclopedia

Midi Music Machine **Ex VAT £829** Inc VAT £974.08

At the heart of this machine is the widely acclaimed Creative Labs AWE 32 P'N'P sound card and Yamaha speakers. The AWE 64 allows you to compose your own music, with complete wave table, true sound and midi capability your options are vast. The voice assist allows the computer to read back your text while you check your work. Raw samples of instruments are held on the Vienna studio with plenty of room to add your own recordings through the dedicated memory. What musician wouldn't have fun with this?

- Pentium P133 Processor
- 8 Mb EDO RAM
- 1.7Gb EIDE HDD
- Mouse
- 3.5" Floppy Drive
- Soundblaster AWE64+ Sound Card
- 8x EIDE CDROM
- Yamaha 10W speakers
- 105 Win'95 Keyboard
- 2 Mb Dram Graphics Card
- Choice of Mini Tower/Desktop Case
- DOS/Windows 3.x or Windows'95



FOR MONITOR OPTIONS SEE PAGE 7.

Infinite Surfer **Ex VAT £679** Inc VAT £797.83

Equipped with a fast 28.8 modem and the latest Internet software ensuring that your computing surfboard is waxed and ready to go, you are bound to be surfing the net. Built to be upgradeable for the future you are sure to have fun with this internet starter.

- DX4-100 Processor
- 8Mb Non Parity RAM
- 1.7Gb EIDE hdd
- 1Mb DRAM graphics card
- 8 Speed EIDE CDROM Drive
- Internal 28.8 Fax Modem with Internet Software
- MS Mouse
- Choice of Mini Tower/Desktop Case
- 105 Win'95 Keyboard
- 3.5" Floppy Drive
- DOS/Windows 3.x or Windows'95



FOR MONITOR OPTIONS SEE PAGE 7.

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The new range of ATX & Pentium Pro systems



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The new ATX motherboard and case design from Intel has been developed with ease of use and expandability and improved reliability in mind. The motherboard has been redesigned so that all the expansion slots are capable of using full length cards. The CPU and SIMM sockets are now repositioned so that they are easily accessible for upgrading. The power supply unit now blows air directly over the processor assisting the heatsink fan, which in turn lowers the noise level. The floppy and EIDE/ATAPI connectors have been repositioned close to the drive bays so there are no untidy cables in the way. The rearrangement inside also means the system produces lower emissions. All these improvements plus support for upcoming technologies such as USB ensure that the systems are easier and more expandable than ever before.



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PENTIUM ATX STARTER

ONLY £1485 Inc VAT £1744.88

Take a close look and you'll see why it's one of our most popular machine configurations on which to build your system.

- Intel Pentium P133MHz processor
- ATX Midi Tower case
- 8 Speed EIDE CD-ROM
- Pipeline Burst Cache
- 2.5Gb EIDE hard drive
- 17" IYAMA MF-8617E monitor - 0.26mm grille, 1280 x 1024 resolution @72Hz refresh
- Intel 'MARI' ATX motherboard
- 2Mb WRAM Graphics Card
- SoundBlaster AWE32+ PnP Audio card
- 16Mb 60ns EDO memory
- 105 Keyboard & Microsoft Mouse



SUPPLIED WITH 17" IYAMA MONITOR

ATX Pro 200

Ex VAT £2039
Inc VAT £2395.85

The ultimate power tool, ideal for true 32 bit operating systems like Windows NT or even Windows'95. This machine can cope with the most daunting of tasks with performance to spare. Even the Saturn V rocket and the NASA moon missions were successfully manned with less processing power than is available to you with a machine like this!

- ATX Midi Tower Case
- Intel Pentium Pro 200 processor
- INTEL 'Venus' Motherboard
- 2.5Gb EIDE HDD
- 32Mb 60ns EDO RAM
- Intel Venus motherboard
- 105 Win'95 Keyboard
- MS Mouse
- 3.5" Floppy Drive
- Dos/Windows 3.x or Windows'95
- Iiyama 17" MF Monitor
- 4Mb WRAM graphics card
- 8x EIDE CDROM
- SoundBlaster AWE32+ PnP sound card
- Yamaha 10 Watt Speakers

A FEW SAMPLES OF INFINITE SYSTEMS
CUSTOM BUILT TO SPECIFICATION - TELL US YOURS NOW..... See back page

MMX Starter

Ex VAT **£1129**
Inc VAT **£1326.58**

Utilising the new MMX multimedia technology from intel, this system pushes the doors wide open on a new and exciting world of multimedia, expanding the boundries of video and audio to their limits, with enhanced graphics display and picture rendering. The P166 will push normal applications to the limits of performance. A superb all-rounder.

- Pentium MMX P166 Processor ● 32 Mb EDO RAM ● 1.7Gb EIDE Hard Drive
- 2Mb MATROX Mystique Graphics Card ● 8 x EIDE CDROM ● MS Mouse
- ATX Mini Tower Case ● 105 Win'95 Keyboard ● 3.5" Floppy Drive
- DOS/Windows 3.x or Windows'95 ● 10W Speakers

Using the new Intel "Tucson" MMX ready Motherboard with on-board 16bit sound



MONITORS

SONY

	Ex VAT	Inc VAT
68-71-1515 - CPD100SX - 15 inches, 0.25mm grille, 1024 x 768 Max. res	£255	£299.63
68-71-1501 - CPD15SF2 - 15 inches, 0.25mm grille, 1280 x 1024 Max. res	£299	£351.33
68-71-1703 - GDM17SE2 - 17 inches, 0.25mm grille, 1600 x 1200 Max. res	£719	£844.33
68-71-1731 - CPD17SF2 - 17 inches, 0.26mm dot pitch, 1280 x 1024 Max. res	£499	£586.33
68-71-2032 - CPD20SF2T - 20 inches, 0.30mm grille pitch, 1280 x 1024 Max	£995	£1169.13
68-71-2014 - GDM20SHT - 20inches, 0.25mm grille pitch, 1600 x 1200 Max	£1559	£1831.83



All the above iiyama monitors are supplied with a 3* year back to base warranty (*15" is 2 years).

We can now offer Vision Care, by iiyama - an on-site next day swap-out contract (See Right).

IIYAMA

68-93-9151 - MF-8515F - 15 inches, 0.28mm dot pitch, 1280 x 1024 Max. res	£249	£292.58
68-93-9171 - MF-8617E - 17 inches, 0.26mm dot pitch, 1280 x 1024 Max. res	£479	£562.83
68-93-9175 - MF-8617ES - 17 inches as MF-8617E with built in stereo speakers	£489	£574.58
68-93-9173 - MT-9017E - 17 inches, 0.25mm dot pitch, 1600 x 1200 Max. res	£506	£594.55
68-93-9211 - MF-8221T - 21 inches, 0.28mm dot pitch, 1600 x 1200 Max. res	£925	£1086.88
68-93-9213 - MT-9021T - 21 inches, 0.30mm dot pitch, 1600 x 1200 Max. res	£959	£1126.83

MONITORS

AOC

68-90-1405 - AOC4VLR - 14 inches, 0.28mm dot pitch, 1024x768 Max. res	£149	£175.08
68-90-1505 - AOC5VLR - 15 inches, 0.28mm dot pitch, 1280x1024 Max. res	£199	£233.83
68-90-1715 - AOC7NLR - 17 inches, 0.28mm dot pitch, 1280x1024 Max. res	£399	£468.83

GOLDSTAR

68-26-1468 - GS1468DM - 14 inches, 0.28mm dot pitch, 1024x768 Max. res	£159	£186.83
68-26-1505 - GS1505DM - 15 inches, 0.28mm dot pitch, 1024x768 Max. res	£202	£237.35
68-26-1557 - GS56i - 15 inches, 0.28mm dot pitch, 1024x768 Max. res	£239	£280.83
68-26-1776 - GS76i - 17 inches, 0.28mm dot pitch, 1280x1024 Max. res	£389	£457.08
68-26-2020 - GS20i - 20 inches, 0.28mm dot pitch, 1600x1280 Max. res	£765	£898.88
68-26-1444 - StudioWorks 44M - 14 inches, 0.28mm dot pitch, 1024x768 Max. res	£165	£193.88

Including built-in Stereo amplifier and speakers

68-26-1556 - StudioWorks 56M - 15 inches, 0.28mm dot pitch, 1280x1024 Max. res

Including built-in Stereo amplifier and speakers

68-26-1778 - StudioWorks 78I - 17 inches, 0.26mm dot pitch, 1600x1280 Max. res

Including XGA FST with optional Stereo Speakers

£449 £527.58

PANASONIC

68-57-1734 - TX1734 - 17 inches, 0.27mm dot pitch, 1280x1024 Max. res

£379 £445.33

TAXAN

68-93-2003 - K20E1080 - 20 inches, 0.28mm dot pitch, 1600x1200 Max. res

£789 £927.08

PHILIPS

68-59-1404 - 104B - 14 inches, 0.28mm dot pitch, 1024 x 768 Max. resolution

£172 £202.10

68-59-1403 - 14C - 14 inches, 0.28mm dot pitch, 1024 x 768 Max. resolution

£159 £186.83

68-59-1513 - 105BR - 15 inches, 0.28mm dot pitch, 1280 x 1024 Max. resolution

£249 £292.58

Including built-in STEREO SOUND

68-59-1505 - 105S - 15 inches, 0.28mm dot pitch, 1024 x 768 Max. resolution

£209 £245.58

68-59-1703 - 107BR - 17 inches, 0.27mm dot pitch, 1280 x 1024 Max. res.

£665 £781.38

68-59-1713 - 107B - 17 inches, 0.28mm dot pitch, 1280 x 1024 Max. resolution

£389 £457.08

Including built-in STEREO SOUND

68-59-2004 - 200B - 20 inches, 0.31mm dot pitch, 1280 x 1024 Max. res.

£829 £974.08

68-59-2003 - 20C - 20 inches, 0.31mm dot pitch, 1280 x 1024 Max. res.

£679 £797.83

68-59-2103 - 201BRC - 21 inches, 0.20mm dot pitch, 1600 x 1200 Max. res.

£1699 £1996.33

68-59-2104 - 201B - 21 inches, 0.28mm dot pitch, 18800 x 1440 Max. res.

£1189 £1397.08

68-59-2113 - 201BR - 21 inches, 0.26mm dot pitch, 1600 x 1200 Max. res.

£1559 £1831.33

All the above monitors are non-Interlaced unless otherwise stated. All monitors are Energy Star compliant.



IIYAMA VISION CARE (Extended Warranty Options)

68-93-9915 - 15" Upgrade on MF-8515F - 2 year on-site swap-out	£15	£17.63
68-93-9917 - 17" Upgrade on MF-8617E/ES & MT-9017E - 3 year on-site swap-out	£39	£45.83
68-93-9921 - 21" Upgrade on MF-8221T & MT-9021T - 3 year on-site swap-out	£49	£57.58

Only available when purchasing an Award winning iiyama monitor.

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The Toolkit is currently available for DOS, Windows 3.x, Windows '95, Windows NT, OS/2, SCO UNIX, Novell NetWare and Apple Macintosh. Updates are available quarterly or monthly.



AS USED BY SMC COMPUTERS PLC

TITLE	3.5" FLOPPY	CDROM DISC
PUBLISHER/TITLE SPECIAL UTILITIES		
Dr. SOLOMON'S		
01-93-9305 Anti-Virus Toolkit* - WIN 95	£69	£81.08
01-93-9303 Anti-Virus Toolkit* - WINDOWS	£68	£79.90
01-93-9301 Anti-Virus Toolkit* - DOS	£59	£69.33
00-00-0000 Audit Starter Pack (5 Users)	£350	£411.25
00-00-0000 Support Software Starter Pack	£459	£539.33

LICENSE PACKS AVAILABLE FOR THE ANTI-VIRUS TOOLKIT. PLEASE CALL.
*Version supplied has 4 quarterly up dates FREE OF CHARGE.

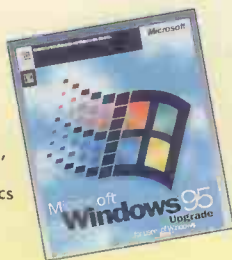
O/S SOFTWARE

PUBLISHER/TITLE	3.5" FLOPPY	CDROM DISC
OPERATING SYSTEM SOFTWARE		
MICROSOFT		
Windows '95 Upgrade	01-50-1957 £59 £69.33	05-50-9509 £59 £69.33
Windows '95 - Full Version	01-50-9503 £129 £151.58	NA NA
Windows 3.11	01-50-0703 £65 £76.38	00-00-0000 £89 £104.58
Windows NT Version 4 Workstation & Server Packs	05-50-1013 £214	£251.45

01-50-1957/05-50-9509 WINDOWS '95

The most exciting software development for the PC environment from Microsoft. Designed to give you more power to perform everyday tasks, with improved memory management, data handling and multimedia, graphics processing. (UPGRADE PACK.)

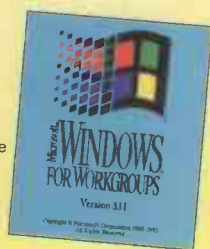
Ex VAT £59 Inc VAT £69.33



01-50-0703 WINDOWS 3.11 FOR WORKGROUPS

The largest selling operating system for the PC environment after DOS. Totally transformed the PC desktop overnight making it more attractive to a wider range of users, more than just an extension to the original DOS only based systems. Opens up a whole new world.

Ex VAT £69 Inc VAT £81.08



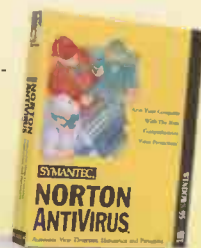
UTILITY SOFTWARE

PUBLISHER/TITLE	3.5" FLOPPY	CDROM DISC
SPECIAL UTILITIES		
NORTON		
01-95-9103 Anti-Virus - Windows	£94	£110.45
01-95-9105 Anti-Virus - WIN 95	£49	£57.58
Navigator 95	00-00-0000 £67	00-00-0000 £78.73
00-00-0000 Utilities V8	£83	£97.53
Utilities - WIN 95	05-95-9060 £99	00-00-0000 £116.33
		£83 £97.53

01-95-9105 ANTI-VIRUS

Probably the most widely known of the Anti-Virus products. A hugely popular program that has been continually developed over the years to detect & protect against even the most destructive of viruses. If your software or data is at risk can you afford to be without it? (WIN 95.)

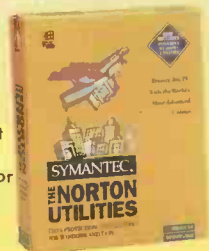
Ex VAT £49 Inc VAT £57.58



05-95-9060 NORTON UTILITIES

A complete package of disk and data recovery tools, a must in any sensitive environment. Can recover and restore lost and deleted files and data, as well as repairing or protecting against damaged or volatile disk areas. Protect and recover your investment now!

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APPLICATION SOFTWARE

PUBLISHER/TITLE

3.5" FLOPPY

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CDROM DISC

OFFICE UTILITIES

MICROSOFT

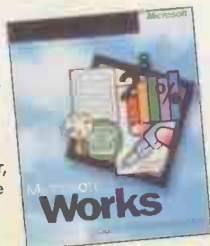
01-50-3155 WORD - WIN 95	£224	£263.20		
01-50-3153 WORD V6	£225	£264.38		
03-50-0154 Works for Windows 95	£76	£89.30		
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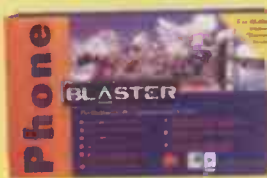
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4.4 Speed, 150ms, 600Kb/s, Tray loading, Internal

£99 £116.33



Pioneer DRM-624X - 51-62-1406

6 disc - 4.4 Speed, 150ms, 600Kb/s, Magazine loading, Audio cable, External

£329 £386.58

Plextor 8Plex -

Eight Speed, 115ms, 1200Kb/s, 256Kb Cache, Caddy loading.

51-93-0800 Internal £239 £280.83

51-93-0805 External £299 £351.33



Panasonic CR-506B - 51-57-0506

Eight Speed, 150ms, 1200Kb/s, 256Kb Cache, Tray loading, Internal

£99 £116.33



Toshiba XM5701B - 51-75-5701

12 Speed, 190ms, 600Kb/s, 256Kb Cache, Tray loading, Internal

£95 £111.63



INFORMATION

The industry compliance standard for Multi-Media is set at two levels, MPC-I and MPC-II (multimedia personal computer). These are in brief, MPC-I single speed CD and 8bit sound and MPC-II dual speed or higher and 16bit sound based on 386sx with 2mb RAM and 486sx with 4mb RAM respectively.



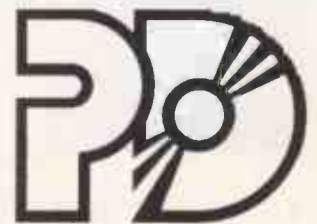
THE NEW 2-IN-1 650MB OPTICAL DISK AND CD-ROM FROM PANASONIC

The PD System from Panasonic is a combined 650Mb rewritable Optical Disk and Quad speed CD-ROM drive.

- 650Mb removable rewritable Optical Disk provides limitless expandable storage which is easy to use as a floppy or hard disk.
- Ideal for data archiving, data back-up, large file storage and data distribution.
- Compatible with DOS, Windows 3.1x, Windows 95, Windows NT and O/S2 Warp.
- Photo-CD, Video CD, and CD-i compatible.
- SCSI-2 interface compatible with the majority of SCSI host adaptors.
- Easy to use tray mechanism accepts both PD Optical Disks and Bare CD-ROMs.
- Apple kit includes Software architects Mac-PC Manager which enables the user to read and write PC formatted PD Optical Disks.

PART No.	MODEL	DESCRIPTION	Ex VAT	Inc VAT
51-57-0400	LF1004B	Internal PD drive	£289	£339.58
51-57-0410	LF1004BK	Internal PD drive kit with SCSI adaptor	£315	£370.13
51-57-0405	LF1000HB	External PD drive	£389	£457.08
51-57-0415	LF1000HBK	External PD drive kit with SCSI adaptor, 1x optical media	£419	£492.33
51-57-0408	LF1000HBA	External PD drive kit for Apple Mac, 1x optical media	£432	£507.60
95-97-0653	LMR650A	Optical Media for Panasonic PD Drive	£33	£38.78
00-00-0000	LMR650A/5	5 Pack Optical Media for Panasonic PD Drive	£149	£175.08

All kits include cables and software. External kits include one PD Optical Disk. Fully featured SCSI adaptor included in kits is an Adaptec AHA1520A.



Panasonic

CD ROM RECORDERS etc.

Ex VAT Inc VAT

52-93-1005 Yamaha CDE-100 - Quad Speed, 650Mb, 512Kb Cache, 614Kb/s, 800ms

External.....£579 £680.33

52-93-1001 Yamaha CDR-100 - Quad Speed, 650Mb, 512Kb Cache, 614Kb/s, 800ms

External.....£519 £609.83

52-28-6020 **HP SURESTORE 6020i KIT**
6 Speed play, 2 Speed Write, 650Mb
145ms, 600Kb/s, 1Mb Cache, Controller
Card, Software, SCSI, Internal

Ex VAT £339 Inc VAT £398.33



52-28-6025 HP Surestore 6020E - Six Speed, Dual speed write, 650Mb, 512Kb Cache, 600Kb/s, 145ms, 1Mb cache
52-28-6027 HP Surestore 6020EP - Six Speed, Dual speed write, 650Mb, 512Kb Cache, 600Kb/s, 145ms, 1Mb cache

External.....£479 £562.83

P/Port.....£479 £562.83

52-95-0122

Plasmon CDR4240I-P1, KIT

4 Speed play, 2 Speed Write, 650Mb
700Kb/s, 1Mb Cache, SCSI controller,
CD Record* and multimedia software
Internal Kit. Ex VAT £419 Inc VAT £492.33



52-95-0127 Plasmon CDR4240E-P1 Complete Kit as above* External.....£469 £551.08

52-95-0120 Plasmon CDR4240I Bare Drive with CD* software Internal.....£379 £445.33

52-95-0125 Plasmon CDR4240E Bare Drive with CD* software External.....£429 £504.08

*Plasmon Drives have full Version of Incat Easy CD PRO, supports Windows 3.1x, NT and Windows 95.

CD ROM JUKEBOXES

Ex VAT Inc VAT

51-62-1406 Pioneer DRM-624X - 4 Speed,
6 CDs, 1 Drive, 600Kb/s, 150ms

External.....£329 £386.58

51-62-1418 **PIONEER DRM-1804X**

Quad Speed, 300ms, 600Kb/s,
18 CD's, 3 Drives, External

Ex VAT £1339 Inc VAT £1573.33



51-62-1450 Pioneer DRM-5004X - Quad Speed, 500 CDs,
1 Drive (max 4), 600Kb/s, 280ms

External ..£12,959 £15,226.83

PARALLEL PORT CD ROM

Ex VAT Inc VAT

51-42-0400 Backpack quad speed CD ROM from Micro
Solutions- 250ms, 700Kb/s max, Tray loading, Data cable

External.....£139 £163.33

51-42-0404 Backpack quad speed + MS SOUND from Micro
Solutions- 250ms, 700Kb/s max, Tray loading, Data cable

External.....£215 £252.63

51-42-0800 Backpack Eight speed CD ROM from Micro Solutions-
145ms, 700Kb/s max, Tray loading, Data cable

External.....£199 £233.83

51-42-0804

Backpack Eight Speed - with MS sound

Eight Speed, 700Kb/s max, Tray loading,
Data cable. External parallel port

Ex VAT £315 Inc VAT £370.13



OPTICAL RECORDERS etc.

Ex VAT Inc VAT

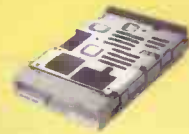
OPTICAL DRIVES

50-24-0230 Fujitsu M2512A - 230Mb,
237Kb cache, 2.1Mb/s, 18ms

Internal.....£279 £327.83

50-24-0640 **FUJITSU M2513A**
640Mb, 21Mb/s, 237Kb Cache,
Internal

Ex VAT £319 Inc VAT £374.83



50-57-1505 Panasonic LF7300B - 1.5Gb,
512Kb Cache, 1.5Mb/s, 45ms

External ..£1495 £1756.63

50-57-1500 **PANASONIC LF7304**
1.5GB, 45ms, 1.5Mb/s, 512Kb
Cache, Internal

Ex VAT £1415 Inc VAT £1662.63



50-28-1300 Hewlett Packard C1716T Dual Capacity -
650Mb, 512Kb Cache, 1Mb/s, 8.3ms

Internal ..£1329 £1561.58

HEWLETT PACKARD C1716T

Dual Capacity, 650Mb, 8.3ms, 1Mb/s,
512Kb Cache, Inc. External Box

Ex VAT £1429 Inc VAT £1679.08



50-28-1305 Hewlett Packard C2550A Dual
Capacity - 1.3Gb, 1.6Mb/s, 1.6ms

External ..£1429 £1679.08

OPTICAL MEDIA

Ex VAT Inc VAT

95-97-0230 230Mb for Fujitsu M2512A

Media.....£18 £21.15

95-97-0640 640Mb for Fujitsu M2513A

Media.....£40 £47.00

95-97-0653 650Mb for Panasonic LF1004

Media.....£35 £41.13

95-97-1300 1.3Gb HP C1716T, HP C2550A

Media.....£67 £78.73

95-97-1500 1.5Gb for Panasonic LF7304, LF7300B

Media.....£95 £111.63

CD ROM ACCESSORIES

Ex VAT Inc VAT

75-95-1402 EIDE Data Cable for up to 2 drives

£10 £11.75

51-95-9700 CD-ROM Caddy (spare drive caddy)

£9 £10.58

75-51-0310 Sound cables: NEC

£8 £9.40

75-57-0570 Panasonic

£8 £9.40

75-75-0751 Toshiba 3x4 for 3xxx series

£8 £9.40

75-75-0757 Toshiba 4x4 for 4xxx series

£8 £9.40

75-75-0753 Toshiba 4x4 for 5xxx series

£8 £9.40

75-75-0753 Gravis Toshiba

£8 £9.40

These cables are only available when purchasing a CD-ROM Drive.

95-97-7174 Blank writeable CDs - 650Mb (74 mins)

Media.....£9 £10.58

**BLANK RECORDABLE
CD WRITER MEDIA
(10 pack)**

Ex VAT £90 Inc VAT £105.75



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Thank you for purchasing your new hard drive from SMC Computers. As part of our commitment to total customer service, we have produced this guide to assist you. It contains important information which will give you a smooth and trouble-free installation. This is intended as a guide and, as such, details may vary slightly depending on your hard drive and PC system manufacturers. Make sure you have your system and DOS manuals to hand for reference.

The guide covers IDE / EIDE and SCSI drives.

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- Installing without a translating BIOS
- SCSI Hard Drive installation
- Basic Troubleshooting
- CMOS configuration
- Installing with a translating BIOS
- SCSI Hard Drive configuration
- Creating a bootable floppy disk

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79-97-3102 - Removable drive caddy for 3.5" drives. Requires 5.25" mounting bay	£35	£41.13
79-95-1135 - Mounts 3.5" drive into a 5.25" bay. All screws supplied. No slide rails.	£10	£11.75

IDE/EIDE CABLES

Ex VAT Inc VAT

75-95-1401 Single Drive, 40 Way Ribbon, 12.5", 2 x IDC40	£8	£9.40
75-95-1402 Dual Drive, 40 Way Ribbon, 20" (4" gap), 3 x IDC40	£10	£11.75
75-95-0400 Custom made to order, 40 Way Ribbon, up to 20". Per metre.	£POA	£POA

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SOFTWARE**



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Model	Ex VAT	Inc VAT
24-95-1300 IDESPC, ISA Bus, 2HDD/2FDD, Standard I/O Port	£13	£15.28
24-97-0300 ADP 60, ISA Bus, 2HDD, LBA Support	£25	£29.38
24-97-0355 ADP 60F, ISA Bus, 2HDD/2FDD, LBA Support	£32	£37.60
24-91-4132 Promise DC - 4030VL2, VESA Bus, 4HDD/2FDD, LBA Support	£35	£41.13
EIDE		
24-97-1360 Promise EIDEMAX, ISA Bus, 2HDD, ATAPI/CD-ROM, LBA Support	£25	£29.38
24-97-1350 EIDEVLB, VESA Bus, 4HDD/2FDD, ATAPI/CD-ROM	£29	£34.08
24-97-1365 Promise EIDEPRO, ISA Bus, 4HDD/2FDD, ATAPI/CD-ROM, Fast I/O Port, LBA Support	£39	£45.83
24-91-2300 Promise DC2300 + VESA Bus, 4HDD/2FDD, ATAPI/CD-ROM, Fast I/O Port, LBA Support	£35	£41.13
24-91-4032 Promise 4030 + Cache, 4x HDD, 1x ATAPI/CD-ROM, Fast I/O Port, LBA Support	£85	£99.88
EIDE/CD ROM		
24-91-5171 Future Domain 16002CD, ISA Bus, ATAPI/CD-ROM	£19	£22.33
24-91-5175 Future Domain 16030/CD 32, ISA Bus, 4HDD, ATAPI/CD-ROM, LBA support	£39	£45.83

STEPPING UP TO ENHANCED IDE
Enhanced IDE (or ATA) has been designed to overcome the limitations of the standard IDE interface. It offers some significant advantages:

- Drive capacities over 528Mb
- More than two drives per system
- Other drives inc Tape, CD-ROM & Removable
- Faster transfer rates



You may require software or Bios upgrade to overcome system limitations.
(all SMC EIDE drives supplied with software)

EIDE 3.5" HARDDRIVES

Ex VAT Inc VAT

3.5" drives All the hard drives come with a 3 year warranty unless otherwise stated

1.0Gb - 1.6Gb

30-64-1288	1.2Gb	Quantum	BF1280AT	128k Cache	15.5ms	£112	£131.60
30-24-1200	1.2Gb	Fujitsu	M1636T	64k Cache	11ms	£125	£146.88
30-70-1201	1.2Gb	Seagate	ST31276A	64k Cache	12.5ms	£119	£139.83
30-64-1281	1.2Gb	Quantum	TM1280AT	128k Cache	11ms	£125	£146.88
30-86-1204	1.2Gb	WD	AC21200A	128k Cache	10ms	£125	£146.88
30-86-1602	1.6Gb	WD	AC21600A	128k Cache	12ms	£135	£158.63

1.7Gb-4.2Gb

30-24-1700	1.7Gb	Fujitsu	M1623T	128k Cache	10ms	£139	£163.33
30-70-2132	2.0Gb	Seagate	ST32132A	128k Cache	10.5ms	£159	£186.83
30-30-2000	2.0Gb	IBM	46H3424	128k Cache	9.5ms	£159	£186.83
30-86-2005	2.0Gb	WD	AC22100A	128k Cache	12ms	£155	£182.13
30-64-2110	2.1Gb	Quantum	TM2100AT	128k Cache	10.5ms	£162	£190.35
30-64-2118	2.1Gb	Quantum	BF2110AT	128k Cache	15.5ms	£139	£163.33
30-64-2550	2.5Gb	Quantum	TM2550AT	128k Cache	10.5ms	£175	£205.63
30-64-2558	2.5Gb	Quantum	BF2550AT	128k Cache	15.5ms	£145	£170.38
30-64-2554	2.5Gb	Quantum	SR2550AT	128k Cache	11ms	£169	£198.58
30-24-2500	2.5Gb	Fujitsu	M1638T	128k Cache	10ms	£169	£198.58
30-86-2500	2.5Gb	WD	AC32500A	128k Cache	12ms	£185	£217.38
30-70-2507	2.5Gb	Seagate	ST52520A	128k Cache	11ms	£169	£198.58
30-30-3000	3.0Gb	IBM	46H3426	128k Cache	9.5ms	£219	£257.33
30-86-3100	3.1Gb	WD	AC33100A	128k Cache	12ms	£195	£229.13
30-64-3200	3.2Gb	Quantum	TM3200AT	128k Cache	10.5ms	£188	£220.90
00-00-0000	3.4Gb	Seagate	ST33440A	128k Cache	10.5ms	£POA	£POA
30-64-3840	3.8Gb	Quantum	TM3840AT	128k Cache	10.5ms	£212	£249.10
00-00-0000	4.2Gb	Seagate	ST34250A	128k Cache	10.5ms	£POA	£POA

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EIDE 2.5" HARDDRIVES

Ex VAT Inc VAT

All the Hard Disk Drives come with a 2 year warranty unless otherwise stated.
(These drives have a 44-pin connector. Please check your system for compatibility).

540mb-1.3Gb

30-75-0810	810Mb	Toshiba	MK1928FC	128k Cache	13ms	£159	£186.83
30-75-1303	1.3Gb	Toshiba	MK1301MAV	128k Cache	14ms	£279	£327.83

NEW

PARALLEL PORT DRIVES

Ex VAT Inc VAT

35-35-0000	IOMEGA ZIP-1.0Gb, Removable Media Drive (see also removable drives)	£108	£126.90
37-42-0850	BPHD-850Mb Parallel port, 14ms, 64Kb Cache, 600Kb/s	£249	£292.58
37-42-1200	BPHD-1.2Gb Parallel port, 14ms, 64Kb Cache, 600Kb/s	£269	£316.08
73-97-1183	Parallel port box for IDE/EIDE drives (any hard drive option)	£79	£92.83



73-97-1183
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REMOVABLE DRIVES

IOMEGA ZIP DRIVES

	Ex VAT	Inc VAT
35-35-0100 100Mb, SCSI(External) Interface, 1.24Mb per second	£105	£123.38
35-35-0105 100Mb, SCSI(Insider) Interface, 1.24Mb per second	£108	£126.90
37-35-0000 100Mb, Parallel port, 1.25Mb per second	£108	£126.90

IOMEGA JAZ DRIVES

35-35-1000 1.0Gb, SCSI(Internal) Interface, 10Mb per second	£259	£304.33
35-35-1005 1.0Gb, SCSI(External) Interface, 10Mb per second	£319	£374.83

IOMEGA ZIP CARTRIDGES

95-35-0101 100Mb, Single	£12	£14.10
95-35-0103 100Mb, 6 Pack	£60	£70.50
95-35-0105 100Mb, 10 Pack	£92	£108.10

IOMEGA JAZ CARTRIDGES

95-35-1001 1.0Gb, Single	£75	£88.13
95-35-1003 1.0Gb, 5 Pack	£360	£423.00

For a full range of data storage products see also Tape Back-up for a listing of Iomega Ditto tape drives.



Iomega Value Data Cartridge Packs

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zip - 100Mb removable Drive



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NEW

26-03-2947 AHA2940UW

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26-03-2920 AHA2920

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26-03-1515 AHA1515UTC, ISA Bus, 25 Pin D-type, max 7 Devices	£56	£65.80
26-03-1542 AHA1542CP, ISA Bus, Micro-D, max 7 Devices + FDD	£157	£184.48
26-03-2842 AHA2842VL, VESA Bus, Micro-D, max 7 Devices + FDD	£149	£175.08
26-03-2825 AHA2825VL, VESA Bus, Micro-D, max 7 Devices (+2 EIDE)+FDD	£85	£99.88
26-03-2941 AHA2940U, PCI Bus, Micro-D, Fast SCSI 2, max 7 Devices	£157	£184.48
26-03-1640 AHA1640, MCA Bus, Micro-D, max 7 devices	£192	£225.60
26-03-2742 AHA2742, EISA Bus, Micro-D, max 14 Devices + FDD	£222	£260.85
26-03-2747 AHA2742W, EISA Bus, Wide SCSI, max 14 Devices + FDD	£242	£284.35
26-03-1460 APA1460, PCMCIA, Centronics, max 7 Devices	£112	£131.60
26-03-3947 AHA3940W, PCI Bus, Wide SCSI, max 14 Devices	£309	£363.08

NEW

NEW

26-03-3940 AHA3940

PCI BUS, MICRO-D INTERFACE SUPPORTS UPTO 14 DEVICES

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26-91-0853 1610MCD, ISA Bus, 25 pin D-type, supp up to 7 devices

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OTHER

26-97-0382 SP328VL, VESA Bus, Micro-D, supports up to 7 devices + FDD

£55 £64.63

Kits are Adaptec products only.



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SCSI MOUNTING KITS

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Mounts 3.5" drive into a 5.25" bay. All screws supplied.

No slide rails (Part No. 79-95-1135)

£10 £11.75

Removable drive caddy for 3.5" drives. Requires 5.25"

mounting bay (Part No. 79-97-3502)

£39 £45.83

Metal version of above plus high performance

drive support (Part No. 79-97-3504)

£69 £81.08

Removable Caddy accepts

3.5" drives in a 5.25"

docking bay. Options for Fast &

Wide are available. Can be used

as a high security option, allowing

quick removal to a secure place, or for

easy movement/ and or change of data

disks between sites.



SCSI CABLES

Ex VAT Inc VAT

Internal

75-95-1501 Single drive, 19 inches

£8 £9.40

75-95-1502 Dual drive, 38 inches

£10 £11.75

75-95-1503 Triple drive, 38 inches

£15 £17.63

75-95-0500 Custom made to order, as required. Per metre.

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FAST & WIDE SCSI & Audio/Video HARD DISKS

Guide:

All SCSI Hard Drives marked with (*)

are Ultra SCSI compliant.

All SCSI Hard Drives come with a 5 year warranty

unless marked with (*) these

come with a 3 year warranty.

All SCSI Hard Drives marked with (A/V) are Audio &

Video compatible, ideal for recording applications with

minimal data loss.



SCSI TOWER AND HARD DRIVE ENCLOSURE

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Connect any SCSI Hard Drive to any SCSI chain. Ideal for Notebook/Laptop users & for exchanging/sharing data.

SCSI HARD DRIVES

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3.5" - 5.25" drives

1.0Gb - 1.2Gb

35-70-1005	1.0Gb	Seagate	ST51080N Medalist *	128k Cache	12.5ms	£1 69	£198.58
35-70-1007	1.0Gb	Seagate	ST31051N Hawk **	256k Cache	10.5ms	£2 24	£263.20
35-64-1281	1.2Gb	Quantum	TM1280S Fireball*	128k Cache	10.5ms	£1 65	£193.88

2.0Gb - 4.4Gb

35-70-2175	2.0Gb	Seagate	ST32171N Barracuda	512k Cache	8ms	£4 79	£562.83
35-13-2107	2.1Gb	Canner	CFP2107S	512k Cache	9ms	£3 59	£421.83
35-30-0000	2.1Gb	IBM	46H6124	512k Cache	8.5ms	£2 29	£269.08
35-64-2110	2.1Gb	Quantum	TM2110S	128k Cache	10.5ms	£1 99	£233.83
35-70-2150	2.1Gb	Seagate	ST32155N Hawk **	512k Cache	10.5ms	£2 97	£348.98
35-70-2105	2.1Gb	Seagate A/V	ST32550N Barracuda	512k Cache	8ms	£4 75	£558.13
35-24-2200	2.2Gb	Fujitsu	M2952S *	512k Cache	8ms	£3 59	£421.83
35-64-3200	3.2Gb	Quantum A/V	TM3200S	128k Cache	10.5ms	£2 45	£287.88
35-70-4375	4.0Gb	Seagate	ST34371N Barracuda	512k Cache	8ms	£7 55	£887.13
35-70-4005	4.0Gb	Seagate A/V	ST15150N Barracuda	1Mb Cache	8ms	£6 69	£786.08
35-13-4207	4.2Gb	Canner A/V	CFP4207S Filepro	512k Cache	9ms	£6 49	£762.58
35-30-4303	4.3Gb	IBM	46H6127	512k Cache	8.5ms	£4 39	£515.83
35-64-4500	4.3Gb	Quantum A/V	XP34550S Atlas	512k Cache	8ms	£5 95	£699.13
35-46-4550	4.3Gb	Micropolis	MIC4345 Capricorn 4	512k Cache	8.5ms	£6 59	£774.33
35-24-4400	4.4Gb	Fujitsu A/V	M2954S *	512k Cache	8ms	£5 75	£675.63
35-70-0000	4.5Gb	Seagate	ST34371N Barracuda	512k Cache	7.5ms	£9 69	£1138.58

9.0Gb - +

35-30-9035	9.0Gb	IBM	9363007	512k Cache	8.5ms	£11 59	£1361.83
35-70-9175	9.1Gb	Seagate	ST19171N Barracuda	512k Cache	8ms	£12 99	£1526.33
35-24-9100	9.1Gb	Fujitsu A/V	M2949S *	512k Cache	8ms	£9 49	£1115.08
35-46-9100	9.1Gb	Micropolis	MIC3391	512k Cache	8.5ms	£11 79	£1385.33
35-70-9000	9.1Gb	Seagate A/V	ST410800N Elite	1Mb Cache	11ms	£11 69	£1373.58
35-64-9100	9.1Gb	Quantum	XP39100S	512k Cache	8ms	£9 95	£1169.13

WIDE SCSI HARD DRIVES

Ex VAT Inc VAT

3.5"-5.25" drives All the Hard drives below come with 5 year warranty (These drives have a 68 pin WIDE SCSI Connector)

2.0Gb - 9.0Gb

35-70-2177	2.0Gb	Seagate	ST32171W Barracuda	512k Cache	8ms	£4 89	£574.58
35-70-2102	2.1Gb	Seagate A/V	ST32155W Hawk *	512k Cache	10.5ms	£3 45	£405.38
35-70-2107	2.1Gb	Seagate A/V	ST32550W Barracuda	512k Cache	8ms	£5 35	£628.63
35-24-2203	2.2Gb	Fujitsu	M29520A	512k Cache	8ms	£4 19	£492.33
35-70-4377	4.0Gb	Seagate	ST34371W Barracuda	512k Cache	8ms	£7 79	£915.33
35-70-4002	4.0Gb	Seagate A/V	ST15230W Hawk	512k Cache	10.5ms	£5 89	£692.08
35-70-4007	4.0Gb	Seagate A/V	ST15150W Barracuda	1Mb Cache	8ms	£7 15	£840.13
35-46-4557	4.3Gb	Micropolis	MIC4345W Capricorn	512k Cache	8.9ms	£6 95	£816.63
35-24-4403	4.4Gb	Fujitsu A/V	M2954QA *	512k Cache	8ms	£6 29	£739.08
35-30-4500	4.5Gb	IBM A/V	9362961	512k Cache	7.5ms	£6 39	£750.83
35-70-0000	4.5Gb	Seagate A/V	ST34501W	512k Cache	7.5ms	£7 15	£840.13
35-64-4507	4.5Gb	Quantum	XP34550W Atlas	512k Cache	8ms	£6 25	£734.38
35-30-9037	9.0Gb	IBM	9362962	512k Cache	8.5ms	£11 79	£1385.33
35-70-9177	9.0Gb	Seagate	ST19171W Barracuda	512k Cache	8ms	£13 35	£1568.63
35-24-9103	9.1Gb	Fujitsu A/V	M2949QA *	512k Cache	8ms	£10 29	£1209.08
35-46-9007	9.1Gb	Micropolis	MIC33911W Scorpion	512k Cache	12ms	£11 99	£1408.83
35-64-9107	9.1Gb	Quantum	XP39100W Atlas	512k Cache	7.5ms	£9 99	£1173.83

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19

"DATA PROTECTION" Tape Back-Up Solutions..

DAT DRIVES

Ex VAT Inc VAT



42-28-0120
C1534 (Replaces HP35470A)
2Gb, 11Mb/min, SCSI interface
Tape G, Internal
Ex VAT £359 Inc VAT £421.83



42-28-0125 C1534-X, 2Gb, 11Mb/min	External G	£459	£539.33
42-28-0130 C1536 (replaces HP 35480A) 4Gb, 22Mb/min	Internal G	£399	£468.83
42-28-0135 C1536-X, 4Gb, 22Mb/min	External G	£519	£609.83
42-28-0160 C1533A, 8Gb, 44Mb/min	Internal G,H	£579	£680.33
42-28-0165 C1533A-X, 8Gb, 44Mb/min	External G,H	£659	£774.33

42-28-0480
C1553A AUTOLOADER
48Gb, 44Mb/min, SCSI interface
Tape G, Internal
Ex VAT £1429 Inc VAT £1679.08



42-28-0485 C1553A-X Autoloader, 48Gb, 44Mb/min	External G,H	£1529	£1796.58
42-28-9505 HP JetStore Warranty (Optional 3 year on-site)		£175	£205.63

HEWLETT PACKARD SURESTORE
42-28-2020 Surestore 2000, 2Gb, 11Mb/min, Internal G £459 £539.33
42-28-2025 Surestore 2000, 2Gb, 11Mb/min, External G £529 £621.58
42-28-2055 Surestore 5000, 4Gb, 22Mb/min, External G £599 £703.83

42-28-2050
SURESTORE 5000
4Gb, 22Mb/min, SCSI interface
Tape G, Internal
Ex VAT £519 Inc VAT £609.83



42-28-3045 Surestore 5000 (Complete Kit)	External	£1589	£1867.08
42-28-2060 Surestore 6000, 8Gb, 44Mb/min,	Internal G,H	£645	£757.88
42-28-2065 Surestore 6000, 8Gb, 44Mb/min,	External G,H	£715	£840.13
42-28-3165 Surestore 6000 (Complete Kit)	External	£1499	£1761.33
42-28-9503 Surestore Warranty (HP 3 Year on site additional warranty)		£109	£128.08

42-28-4120
SURESTORE 12000E AUTOLOADER
48Gb, 44Mb/min, SCSI interface
Tape G,H External
Ex VAT £1739 Inc VAT £2043.33



At SMC we carry a huge range of quality backup and storage products... from tape drives to harddrives, from CD writers to Optical drives.

42-28-9503 HP SURESTORE

3 Year On-Site
Additional Warranty
£109 Ex.VAT
Inc VAT £128.08



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DAT DRIVES

Ex VAT Inc VAT

42-13-0205 **CONNER 4350**
2Gb, 11Mb/min, SCSI interface
Tape G, External
Ex VAT £455 Inc VAT £534.63



CONNER

42-13-0200 4320, 2Gb, 11Mb/min,	Internal G	£365	£428.88
42-13-0400 4324, 4Gb, 22Mb/min,	Internal G	£415	£487.63
42-13-0405 4354, 4Gb, 22Mb/min,	External G	£505	£593.38
42-13-0800 4326, 8Gb, 44Mb/min,	Internal G,H	£515	£605.13
42-13-0805 4356, 8Gb, 44Mb/min,	External G,H	£595	£699.13

SONY

42-71-0020 SDT-2000E, 2Gb, 11Mb/min,	Internal G	£399	£468.83
42-71-0040 SDT-5200, 5Gb, 22Mb/min,	Internal G,H	£489	£574.58
42-71-0090 SDT-5000, 4.8Gb, 22Mb/min,	Internal G,H	£529	£621.58
42-71-0320 TSL-7000 Autoloader, 64Gb, 22Mb/min	Internal G,H	£1429	£1679.08

42-71-0080

SDT-7000 QUAD
4.8Gb, 44Mb/min, SCSI interface, Tape G,H Internal
Ex VAT £579 Inc VAT £680.33



WANGDAT

42-84-1000 3100, 2Gb, 11Mb/min,	Internal G	£379	£445.33
42-84-1005 3100, 2Gb, 11Mb/min,	External G	£535	£628.63
42-84-2000 3200, 4Gb, 22Mb/min,	Internal G	£449	£527.58
42-84-4000 3400DX, 8Gb, 44Mb/min,	Internal G,H	£549	£645.08
42-84-4005 3400DX, 8Gb, 44Mb/min,	External G,H	£629	£739.08

42-84-2005 3200

4Gb, 22Mb/min, SCSI interface
Tape G, External
Ex VAT £539 Inc VAT £633.33



BACK-UP SOFTWARE

Ex VAT Inc VAT

CHEYENNE

01-90-4001 **ArcSolo, DOS**, Single user, Workstation based, Netware aware, Will backup any workstation or network. £66 £77.55
01-90-5001 **ArcSolo, Windows 3.x**, Single user, Workstation based, Supports Windows for Workgroups, Personal Network & LanTastic workgroups and even Server volumes. £95 £111.63
01-90-6011 **ArcSolo, Windows 95**, Single user, Multi-Threaded operation, Backup Recovery disk - complete restore from one Floppy £89 £104.58
01-90-6003 **ArcSolo, Windows 95, Upgrade**, Single user Upgrade from previous versions. £25 £29.38

Arcserve for Network Windows Editions are Server based, will allow automated backup of all connected file servers and workstations running DOS, OS/2 and Windows 3.x. Optional support packs are available for UNIX and Macintosh.

01-90-5005 ArcServe, Netware-Windows, 5 User/server	£159	£186.83
01-90-5010 ArcServe, Netware-Windows, 10 User/server	£349	£410.08
01-90-5025 ArcServe, Netware-Windows, 25 User/server	£588	£690.90
01-90-5050 ArcServe, Netware-Windows, 50 User/server	£739	£868.33

Note: We can also supply Arc Serve for DOS-based NetWare systems plus 100, 250 and 500 user NetWare networks. Versions for many other operating systems including UNIX & SUN are also available. Please call for more details and prices.

Arcserve 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), better support for NetWare 4.1 than previous versions, improved Windows 95 style user interface.

01-90-6011 Single Workgroup Edition	£320	£376.00
01-90-6015 Enterprise Edition (Supports Multiple Servers).	£789	£927.08

Arcserve 6 for Windows NT. Supports Windows NT, Windows 95 and Windows 3.x. Clients (optional agents available for NetWare, UNIX, OS/2 and Macintosh). Windows NT 4.0 compatible, Built in Virus Scanner.

01-90-6033 Workstation Edition	£125	£146.88
01-90-6031 Single Server Edition	£330	£387.75
01-90-6035 Enterprise Edition (Supports Multiple Servers).	£559	£656.83

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TAPE DRIVES

Ex VAT Inc VAT

Use the Tape Selector chart on page XX to identify the tape you need.



48-10-0800

TRAVAN T1000

800Mb, 9.5Mb/min, Floppy interface,
Optional dedicated controller.

Incl: Dos/Windows software.

FREE Tape A,B. **Internal**

Ex VAT £79 Inc VAT £92.83



48-10-8005

TRAVAN T4000S

8Gb, 62Mb/min, SCSI required,

Incl: Dos/Win3.x, Win'95 software,

1x FREE tape, Tape N. **Internal**

Ex VAT £232 Inc VAT £272.60



WANGTEK Backup software required. SCSI controller required. Ask sales contact for options available.

48-84-0525

5525ES

525Mb wide tape, 12Mb/min, SCSI
interface, Tape D,E **Internal**

Ex VAT £295 Inc VAT £346.63



48-84-0525 5525ES, 525Mb, 12Mb/min,
48-84-1000 51000ES, 1Gb, 17Mb/min,

Internal D,E £295 £346.63
Internal D,E,F £359 £421.83



CONNER All drives include Dos/Win 3.x, Win'95 software, 1x FREE tape. TSM3200/400R-A controller card

48-13-0800

TST 800R TRAVAN

800Mb, 9.5Mb/min, Floppy interface,
DOS/Win software, Tape A,B, **Internal**

Ex VAT £75 Inc VAT £88.13



48-13-3200 TSM 3200R, 3.2Gb, 19Mb/min,
48-13-8000 TST 8000R-A EIDE, 4.0Gb, 54Mb/min,
48-13-8005 TST 8000R-S SCSI, 4.0Gb, 54Mb/min,
48-13-8015 TST 8000ES-S SCSI, 4.0Gb, 54Mb/min,

Internal L £122 £143.35
Internal M £227 £266.73
Internal M £229 £269.08
External M £295 £346.63

TAPE BACKUP!
Protection against.....
FIRE - THEFT - DAMAGE

TAPE DRIVES

Ex VAT Inc VAT

Use the Tape Selector chart on page XX to identify the tape you need.



All DITTO drives come with DOS/Win 3.x and Win'95 software. Optional dedicated controller available

46-35-2000

Ditto 2000

2.0Gb Ditto tape, 19Mb/min, Floppy
interface, Tape D,E **Internal**

Ex VAT £95 Inc VAT £111.63



46-35-2009 Ditto 2000, P/Port, 2.0Gb, 19Mb/min

External M £129 £151.58



All Trakker drives include Dos/Win 3.x, Win'95 software. T1000E/Travan 800 includes 1x FREE tape.

PARALLEL PORT

All drives run from standard ports and have a pass-through port for printers.

46-10-0800 Trakker T1000E Travan, 800Mb, 8Mb/min External A,B £99 £116.33

46-42-0800

BACKPACK 800 TRAVAN

800Mb, 8Mb/min, parallel port
interface, Backup software,
Tape A,B, **External**

Ex VAT £99 Inc VAT £116.33



46-42-0800 Backpack 800 Travan, 800Mb, 8Mb/min,

External A,B £105 £123.38

PARALLEL PORT ACCESSORIES

70-10-0400 Trakker Carry Case £39 £45.83

COLORADO ACCESSORIES

00-00-0000 Backup Software for Unix/Xenix (Unix/Xenix dedicated backup software) £75 £88.13
00-00-0000 Backup Software for OS/2 (OS/2 dedicated backup software) £79 £92.83

00-00-0000

WINDOWS 3.1x SOFTWARE

Dedicated software for Windows
interface, full backup options incl,
scheduled

Ex VAT £49 Inc VAT £57.58



CONNER TST800P includes Dos/Win 3.x, Win'95 software, 1x FREE tape.

48-13-0809

TST 800EP TRAVAN

800Mb, 9.5Mb/min, Parallel port
interface, Tape A,B, **External**

Ex VAT £105 Inc VAT £123.38



**CHECK TAPE SELECTOR CHART ON
PAGE. 31 FOR TAPE TYPE & PRICE.**

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SALES FAX

01753 524443

WORLD CLASS SERVICE & PERFORMANCE



We remember when 20Mb was the standard for Hard Drives...

Unfortunately, you can't tell if a memory module is absent-minded just by looking at it.

So, it's reassuring to know that at SMC we haven't forgotten the importance of quality control. By instigating more frequent batch checks and tougher tests we aim to maintain the quality of our goods, and safeguard our hard won reputation for reliability.

Our range of SIMMS and Matched Memory is exhaustive. And because we stock in depth we can guarantee swift delivery times and

very competitive prices.

Unlike other suppliers we won't have a convenient memory block if you need our help. All SMC customers have access to a superb level of technical support.

Best of all, you only need to take a glance at our prices to see that you won't pay any extra for an extra special service. In fact, once you've done business with us, we think you'll recall us again and again.



72 PIN SIMM ACTUAL SIZE. CHIP CONFIGURATIONS MAY VARY.

How is your Memory?

SIMMS - 30 PIN

Ex VAT Inc VAT

Note: Standard 9 & 36-bit SIMMs have full parity checking. We batch test SIMMs to ensure quality & reliability.

1Mb	60ns	70ns	80ns
Full Parity, 1Mb x 9bit, 3 Chip	10-97-1963 £15 £17.63	10-97-1972 £9 £10.58	10-97-1983 £17 £19.98
Full Parity, 1Mb x 9bit, 9 Chip	10-97-1969 £22 £25.85	10-97-1979 £12 £14.10	10-97-1989 £24 £28.20
4Mb			
Full Parity, 4Mb x 9bit, 3 Chip	10-97-4963 £24 £28.20	10-97-4973 £18 £21.15	
Full Parity, 4Mb x 9bit, 9 Chip	10-97-4969 £25 £29.38	10-97-4979 £25 £29.38	
16Mb			
Full Parity, 16Mb x 9bit, 9 Chip		10-97-7979 £339 £398.33	

SDRAM MEMORY - 168 PIN

8 Mb, Non Parity, 1Mb x 64bit	19-95-0821	£99	£116.33
16 Mb, Non Parity, 2Mb x 64bit	19-95-1622	£136	£159.80
32 Mb, Non Parity, 4Mb x 64bit	19-95-3224	£269	£316.08

SDRAM requires motherboard support - uses dedicated 168 pin connector

DIMM MEMORY - 72 PIN

4 Mb, 3.3V, 1 x 4, 70ns	19-93-0447	£119	£139.83
4 Mb, 3.3v, 1 x 16, 70ns	19-93-0417	£50	£58.75
8 Mb, 3.3v, 1 x 16, 70ns	19-93-0817	£79	£92.83
8 Mb, 3.3v, 2 x 8, 70ns	19-93-0827	£80	£94.00
16 Mb, 3.3v, 4 x 4, 70ns	19-93-1641	£119	£139.83
4 Mb, 5v, 1 x 4, 70ns	19-93-0427	£50	£58.75
4 Mb, 5v, 1 x 16, 70ns	19-93-0437	£49	£57.58
8 Mb, 5v, 1 x 16, 70ns	19-93-0817	£79	£92.83
8 Mb, 5v, 2 x 8, 70ns	19-93-0831	£80	£94.00
16 Mb, 5v, 4 x 4, 70ns	19-93-1647	£119	£139.83

Please check machine compatibility before ordering - for voltage and fitting: i.e 1 x 4 chip 5v etc.

Not sure which module to use?

Our sales staff can quickly identify the right memory for your system. Call SMC for the best in memory upgrades.



SIMMS - 72 PIN

Ex VAT Inc VAT

Note: Standard 9 & 36-bit SIMMs have full parity checking. We batch test SIMMs to ensure quality & reliability.

1Mb	60ns	70ns
Full Parity, 256k x 36bit		13-97-0117 £26 £30.55
2Mb		13-97-0217 £39 £45.83
Full Parity, 512k x 36bit		
4Mb		
Non Parity, 1Mb x 32bit	13-97-0406 £15 £17.63	13-97-0407 £13 £15.28
Full Parity, 1Mb x 36bit	13-97-0416 £22 £25.85	13-97-0417 £21 £24.68
8Mb		
Non Parity, 2Mb x 32bit	13-97-0806 £22 £25.85	13-97-0807 £21 £24.68
Full Parity, 2Mb x 36bit	13-97-0816 £35 £41.13	13-97-0817 £33 £38.78
16Mb		
Non Parity, 4Mb x 32bit	13-97-1606 £49 £57.58	13-97-1607 £48 £56.40
Full Parity, 4Mb x 36bit	13-97-1616 £65 £76.38	13-97-1617 £62 £72.85
32Mb		
Non Parity, 8Mb x 32bit	19-97-3206 £97 £113.98	13-97-3207 £96 £112.80
Full Parity, 8Mb x 36bit	13-97-3216 £128 £150.40	13-97-3217 £126 £148.05

EDO MEMORY - 72 PIN

EDO Memory	60ns	
4 Mb, Non Parity, 1Mb x 32bit	£14	£16.45 13-97-0400
8 Mb, Non Parity, 2Mb x 32bit	£23	£27.03 13-97-0801
16 Mb, Non Parity, 4Mb x 32bit	£48	£56.40 13-97-1601
32 Mb, Non Parity, 8Mb x 32bit	£98	£115.15 13-97-3201
64 Mb, Non Parity, 16Mb x 32bit	£465	£546.38 13-97-6401

EDO Memory requires Motherboard support. Offers faster performance.

Buy 5 or more SIMMS and SAVE £0.25 pence per Mb

Buy 13 or more SIMMS and SAVE £0.50 pence per Mb

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Kingston

TECHNOLOGY CORPORATION



If all memory is the same, why do some brands fail more often than others?

Increasing memory is the single best way to improve system performance and computing efficiency. PC Computing's recent study on productivity demonstrated how adding just 4Mb of memory increased managers productivity by 26%.

Why Kingston memory?

Kingston makes sure you get the exact product that you need & then guarantees it for compatibility, and value for money - for a lifetime. Every Kingston module is designed for and tested in each specific machine, ensuring total compatibility. Kingston can do this because it is the world's biggest DRAM manufacturer. **Buying Kingston is buying peace of mind.**

Kingston produces memory which is guaranteed compatible with all the major computer manufacturers including:

ACER, ALR, APPLE, AST, AT+T - NCR, BROTHER, CANON, COMPAQ, DELL, DIGITAL, EPSON, EVEREX, GATEWAY, HEWLETT PACKARD, IBM, IBM/ LEXMARK, INTEL, NEC, OKI, PACKARD BELL, PANASONIC, SAMSUNG, SHARP, SILICON GRAPHICS, SUN, TEKTRONIX, TEXAS INSTRUMENTS, TOSHIBA & ZENITH - TO NAME BUT A FEW.

FREE
KINGSTON MOUSEMAT WITH EVERY ORDER OVER 15Mb
APPLIES TO ANY COMBINATION i.e. 4X 4Mb OR 2X 8Mb etc.

KINGSTON GENERIC MEMORY - 30PIN, 72 PIN & EDO Ex VAT Inc VAT

	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb
30 Pin 3 Chip Simms 60 or 70Ns	KTM1000/9-70 £2.5 £29.38		KTM4000/9-70s £3.8 £44.65				
30 Pin 9 Chip Simms 60 or 70Ns	KTM1100/9-70s £1.2 £14.10		KTM4900/9-70 £3.8 £44.65				
72 Pin Non-Parity Simms 60 or 70Ns			KTM1x32L-60T £2.9 £34.08	KTM2x32L-60T £5.9 £69.33	KTM4x32L-60T £10.7 £125.73	KTM8x32L-60T £21.3 £250.28	KTM16x32L-60T £46.2 £542.85
72 Pin Parity Simms 60 or 70Ns			KTM1x36L-60T £3.8 £44.65	KTM2x36L-60T £7.8 £91.65	KTM4x36L-60T £12.2 £143.35	KTM8x36L-60T £24.3 £285.53	KTM16x36L-60T £51.9 £609.83
72 Pin EDO Non-Parity Simms 60Ns			KTM1x32L-60ET £2.9 £34.08	KTM2x32L-60ET £5.9 £69.33	KTM4x32L-60ET £10.7 £125.73	KTM8x32L-60ET £21.3 £254.98	KTM16x32L-60ET £46.2 £542.85

KINGSTON MEMORY

SYSTEM	4Mb	8Mb	16Mb	32Mb	64Mb	KIT
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AST						
Advantage, Adventure & Pro, Bravo LC/ LCIV/LCIVL, LP, MS, MS-L, MS-T, MT	KST0987/4 £29	KST0987/8 £34.08	KST0987/16 £59	KST0987/32 £69.33	KST0987/64 £107	YES on 8Mb & 32Mb
Manhattan G, V, Premia, MTE, SE		KST486P/8 £79	KST486P/16 £92.83	KST486P/32 £156	KST486P/64 £183.30	YES
Ascentia 800N, 810N Series	KST800N/4 £49	KST800N/8 £57.58	KST800N/16 £79	KST800N/32 £92.83	KST800N/64 £150	£176.25
Ascentia 900N, 910N Series	KST1392/4 £89	KST1392/8 £104.58	KST1392/16 £130	KST1392/32 £152.75	KST1392/64 £243	£285.53
COMPAQ						
Deskpro XL, ProSignia 300/500 Series		KTC1481/8 £68	KTC1481/16 £79.90	KTC1481/32 £135	KTC1481/64 £158.63	£224 £263.20
LTE 5000, 5100, 5200, 5300		KTC-E5000/8 £68	KTC-E5000/16 £79.90	KTC-E5000/32 £122	KTC-E5000/64 £143.35	£232 £271.90
Presario 577/9000 Series, 972/978/982 CDS & 992 CDS, ProLinea 575e, 5100e, 5120e	KTC-PNP/4T £45	KTC-PNP/8T £52.88	KTC-PNP/16T £90	KTC-PNP/32T £105.75	KTC-PNP/64T £170	£199.75
Presario CDS 510/520/524/526/720/724 CDS 774/860/920, ProLinea Desktop 450	KTC-PNP/4 £45	KTC-PNP/8 £52.88	KTC-PNP/16 £90	KTC-PNP/32 £105.75	KTC-PNP/64 £170	£199.75
Presario 800 r/s Series, Deskpro 486XE ProSignia VS, ProLinea MT/CDS/Net/Enhanced	KTC-PL433/4 £56	KTC-PL433/8 £65.80	KTC-PL433/16 £111	KTC-PL433/32 £130.43	KTC-PL433/64 £190	£223.25
DELL						
Dimension XPS P166C, OptiPlex GL, GW, GWL, GX, GXM, GXMT		KTD-OPGL/8 £98	KTD-OPGL/16 £115.15	KTD-OPGL/32 £195	KTD-OPGL/64 £229.13	£367 £431.23
Dimension XPS P75, P90, P100, P100 to 133C, OptiPlex XL, XM, XMT Peripherals		KTD-NPOP/8 £90	KTD-NPOP/16 £105.75	KTD-NPOP/32 £180	KTD-NPOP/64 £211.50	£339 £398.33
Dimension XPS 486, XPS P60FS, NetPlex 486, Omni & OptiPlex/Performance/PowerEdge 486s	KTD-LMT/4 £29	KTD-LMT/8 £34.08	KTD-LMT/16 £57	KTD-LMT/32 £66.98	KTD-LMT/64 £107	£125.73
Latitude 433m, 433mc, 450mc, 450mcx, 475mc, Latitude LX 4750, 4100D, 4100T	KTD-LTDM/4 £58	KTD-LTDM/8 £79.90	KTD-LTDM/16 £115	KTD-LTDM/32 £135.13	KTD-LTDM/64 £212	£249.10
OptiPlex GX Pro Series				KTD-GXPRO/32 £291	KTD-GXPRO/64 £341.93	£631 £741.43
IBM						
Aptiva 486 Series, PC 300-330/350 Series	KTM-APTIV/4 £29	KTM-APTIV/8 £34.08	KTM-APTIV/16 £59	KTM-APTIV/32 £69.33	KTM-APTIV/64 £107	£125.73
PC 300 Series 300-6576, 350-6586 range	KTM-APTIV/4T £45	KTM-APTIV/8T £52.88	KTM-APTIV/16T £90	KTM-APTIV/32T £105.75	KTM-APTIV/64T £170	£199.75
PS/1 486 Series, PS/ValuePoint 486 Series, PS/2 Model 53, 56, 57, 76, 77, 90, 95, 95XP, 486s	KTM-0128 £58	KTM-0130 £79.90	KTM-0132 £111	KTM-0134 £130.43	KTM-0136 £190	£223.25
ThinkPad 340, 345, 355, 360, 370, 730 Series	KTM-TP360/4 £74	KTM-TP360/8 £86.95	KTM-TP360/16 £125	KTM-TP360/32 £146.88	KTM-TP360/64 £227	£266.73
ThinkPad 760 Series		KTM-TP760/8 £130	KTM-TP760/16 £152.75	KTM-TP760/32 £315	KTM-TP760/64 £370.13	£1476 £1734.30
ThinkPad 750, 755 Series	KTM-TP750/4 £99	KTM-TP750/8 £116.33	KTM-TP750/16 £176	KTM-TP750/32 £206.80	KTM-TP750/64 £258	£303.15
PC365 S180 6589-10U, 6589-17U, S200 6589-12U, 6589-18U				KTM0274/16 £153	KTM0274/32 £179.78	£296 £347.80
TOSHIBA						
T2100, T2105, T2110, T2115, T2130	KTT2100/4 £49	KTT2100/8 £57.58	KTT2100/16 £82	KTT2100/32 £96.35	KTT2100/64 £156	£183.30
T2135, T2150 & T2155 Series, Satellite Pro 410CDT, 410CS, 415CS		KTT610/8 £87	KTT610/16 £102.23	KTT610/32 £160	KTT610/64 £188.00	£329 £386.58
Portege 610CT, T4400, T4600 & T6600 Series	KTT4400SV/4 £109	KTT4400SV/8 £128.08	KTT4400SV/16 £197	KTT4400SV/32 £231.48	KTT4400SV/64 £227	£266.73
T1900, T1910, T1950, T1960 Series, T4500, T4600, T4700, T4800, T4850 Series	KTT4600/4 £79	KTT4600/8 £92.83	KTT4600/16 £135	KTT4600/32 £158.63	KTT4600/64 £248	£291.40

SALES HOTLINE TEL 01753 550333
SALES FAX 01753 524443
WORLD CLASS SERVICE & PERFORMANCE



Making the perfect match

Matched memory modules from SMC are designed to the original manufacturers specifications. So they will slot perfectly into your PC with the minimum of fuss. It's important to remember that although some system modules may look similar they are generally specifically configured for a particular system.

All our matched memory upgrades are supplied with a full 5 year warranty. When ordering don't forget to ask about our free anti-static wrist straps to ensure safer installation.



Right across the board

We can supply system matched memory for PCs built by the world's leading manufacturers - including AST, Ambra, Apple, Apricot, Canon, Compaq, Dell, Elonex, Escom, Gateway, Hewlett Packard, IBM, NEC, Toshiba and Zenith. Don't worry if your PC isn't listed here. We cater for many more systems and our memory module experts will be only too happy to help.

Memory upgrades for all popular PCs.

We can supply memory modules for PCs from all the major manufacturers. If you cannot find your system listed here, please call our components sales team.

PLEASE NOTE: Prices are set according to the PC's requirements. Kits are complete upgrades which often include several modules.

IBM MEMORY

SYSTEMS	Ex VAT Inc VAT					
	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb
APTIVA 300, 500 & 700 486s		13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	
APTIVA PENTIUM Series (Kit-2)			13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10
IBM PC300, 330, 350 486s		13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	
IBM PC300, 330, 350 Pentiums (Kit-2)			13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10
IBM PC700, 730, 750 Pentiums (Kit-2)			17-30-9108 £55 £64.63	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63	00-00-0000 £398 £467.65
PC SERVER 77i (ECC)		00-00-0000 £69 £81.08	00-00-0000 £135 £158.63	00-00-0000 £489 £574.58		
PC SERVER 300, 320, Server 85 (Kit-2)			17-30-9108 £55 £64.63	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63	00-00-0000 £398 £467.65
PC SERVER 95 & 500 Series (ECC) (Kit-2)			17-30-2908 £138 £162.15	17-30-7816 £499 £586.33	17-30-7832 £649 £762.58	
PC SERVER 486 & Pentium Series (Kit-2)		00-00-0000 £60 £70.50	17-30-9108 £55 £64.63	00-00-0000 £192 £225.60	00-00-0000 £398 £467.65	
PS/1 486 Series with IBM 72pin slots	17-30-9302 £38 £44.65	17-30-9204 £32 £37.60	17-30-9208 £198 £232.65	17-30-1516 £189 £222.08	00-00-0000 £199 £233.83	
PS/1 486 Series with IBM 30pin slots		17-30-1404 £95 £111.63		10-97-4973 x4 £136 £159.80		
PS/1 2011 & 2121 286/386sx Series	17-30-1202 £55 £64.63	17-30-1304 £85 £99.88				
PS/1 2123 PRO 386SX	17-30-9302 £38 £44.65	17-30-9204 £37 £43.48	17-30-9108 £55 £64.63			
PS/1 386SX Series	17-30-9102 £69 £81.08	17-30-9204 £32 £37.60	17-30-9108 £55 £64.63			
PS/2 SERIES - PLEASE CALL - MODEL SPECIFIC						
PS/VP 6382, 6384, 6387 with IBM 72pin slots	17-30-9302 £38 £44.65	17-30-9204 £32 £37.60	17-30-9108 £55 £64.63	13-97-1617 £68 £79.90		
PS/VP 6384 Series with IBM 30pin slots		17-30-1404 £94 £110.45		10-97-4973 x4 £136 £159.80		
PS/VP 6384 C00, C20, C40 Series	17-30-9102 £69 £81.08	17-30-9304 £44 £51.70	17-30-9208 £198 £232.65			
PS/VP 6381 SI Series		00-00-0000 £30 £35.25		13-97-1617 £68 £79.90		
ValuePoint Performance 6472, 6482, 6484, 6492, 6494 Series		00-00-0000 £30 £35.25	17-30-9108 £55 £64.63	13-97-1617 £68 £79.90	00-00-0000 £199 £233.83	
ValuePoint P60/D 6384 189, 193, 199, 1A3, 1A9 (Kit-2)			17-30-9108 £55 £64.63	17-30-1516 £158 £185.65	00-00-0000 £378 £444.15	00-00-0000 £384 £451.20
LAPTOPS						
PS/2 Model L40 SX, N33 SX, CL57 SX	17-30-7502 £55 £64.63	17-30-7504 £89 £104.58	17-30-7508 £199 £233.83			
PS/2 Model N51 SL, SX	17-30-5102 £55 £64.63	17-30-5104 £79 £92.83	17-30-5108 £99 £116.33			
PS/Note 182, 2141 N82 Series	17-30-7502 £55 £64.63	17-30-7504 £89 £104.58	17-30-7508 £199 £233.83			
PS/Note 2618 C45, E35, M40		17-30-7504 £89 £104.58	17-30-5108 £99 £116.33	17-30-0416 £225 £264.38		
PS/Note N45 SL (Call)	00-00-0000 £POA	00-00-0000 £POA				
Portable PS/2 Model P70-031, 061, 121	17-30-9202 £49 £57.58					
Portable PS/2 Model P75-161, 401	17-30-9302 £42 £49.35	17-30-9204 £37 £43.48				
ThinkPad 340, 355, C/CS, 360 Series	17-30-0902 £99 £116.33	17-30-0504 £75 £88.13	17-30-0508 £125 £146.88	17-30-0516 £169 £198.58		
ThinkPad 350, 350C		17-30-7504 £89 £104.58	17-30-5108 £99 £116.33	17-30-0416 £225 £264.38		
ThinkPad 500, 500CS, 510CS		17-30-0704 £75 £88.13	17-30-0708 £169 £198.58	17-30-0716 £439 £515.63		
ThinkPad 700, 700C, 720, 720C		17-30-4204 £89 £104.58	17-30-4208 £175 £205.63			
ThinkPad 701C, 701CS		00-00-0000 £POA	17-30-0898 £59 £69.33	00-00-0000 £POA		
ThinkPad 750, 755 Series		17-30-4204 £89 £104.58	17-30-4208 £175 £205.63	15109 £199 £233.83		
ThinkPad 760 Series (Call)			17-30-0908 £95 £111.63	17-30-0916 £189 £222.08		

SMC PROVIDES A 7 DAY NO QUIBBLE REFUND GUARANTEE

This does not apply to PC systems, printers, software, made to order cables and carriage charges. E&OE. Prices and specifications subject to change without notice. Please ask our advice before ordering to avoid any foreseeable incompatibility problems. All trademarks acknowledged. SMC Computers PLC terms and conditions on request. This does not effect your statutory rights. Prices exclude delivery.

NO HIDDEN EXTRAS FROM SMC

Prices in RED Exclude VAT
Prices in Black Include VAT

COMPAQ MEMORY

Ex VAT Inc VAT

SYSTEMS	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb
Deskpro 286e, 386/20, 25, 20e, 25e	17-09-0301 £56 £65.80		17-09-0304 £79 £92.83					
Deskpro 386/25M, 33M	17-09-0701 £49 £57.53	13-97-0217 £39 £45.83	17-30-9204 £37 £43.48	13-97-0817 £46 £54.05				
Deskpro 486s/76M, 25M, 33M, 50M, 66M	00-00-0000 £43 £50.53	00-00-0000 £56 £65.80	00-00-0000 £37 £43.48	00-00-0000 £46 £54.05				
Deskpro 3/25i, 33, 4/25iS, 33i, 66i			17-30-9204 £37 £43.48	13-97-0817 £46 £54.05				
Deskpro 386/33		17-09-1002 £84 £98.70						
Deskpro 386S/16, 386s	17-09-0401 £62 £72.85		17-09-0405 £95 £111.63					
Deskpro 386S/20, 20N, 386N		13-97-0217 £39 £45.83	17-30-9204 £37 £43.48					
Deskpro 386/33L, 486/25, 33L, 50L	17-09-1002 £84 £98.70			17-09-1008 £109 £128.08		17-09-1032 £599 £703.83		
Deskpro 450, 466, 4100			13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98		
Deskpro MX 590MX, 575MX (Kit-2)				13-97-0407 x2 £30 £35.25	13-97-0807 x2 £48 £56.40	13-97-1607 x2 £106 £124.55	13-97-3207 x2 £194 £227.95	
Deskpro XE 560, 5/60M, 5/66M Kit				17-09-8008 £98 £115.15	17-09-8016 £119 £139.83	17-09-8032 £195 £229.13	17-09-8064 £375 £440.63	17-09-8088 £725 £851.88
Deskpro 575, 590, 5100, 5120, 5133 (Kit-2)				13-97-0407 x2 £30 £35.25	13-97-0808 x2 £76 £89.30	13-97-1607 x2 £156 £183.30	13-97-3207 x2 £332 £390.10	
Deskpro XE 4/33, 33S, 50, 66, 100	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05					
Deskpro XL 450, 466, 560, 566, 575, 590, 5100, 5120, 5133 Kit		17-09-0804 £79 £92.83	17-09-0808 £55 £64.63	17-09-0816 £95 £111.63	17-09-0832 £169 £198.58	00-00-0000 £POA £POA		
Enhanced Prolinea 425, 433, 33s, 50, 50s, 66, 100	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63			
Presario 425, 433		13-97-0417 £21 £24.68	13-97-0817 £46 £54.05					
Presario 633, 650, 660	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63			
Presario 833 CDS, 850, 866 C/F/S Series	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63			
Presario 520, 720, 744, 920, 924, 954 Series		13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98			
Presario CDS-510, 520, 524, 526, 720, 724, 860, 920, 924 Series		13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98			
Presario CDTV-520, 528, 920 Series		13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98			
Presario 7170, 7180, 9546, 9548, 9564 Series (Kit-2)			13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10		
Presario CDS-774, 972, 982, 992, CDTV-978 Series (Kit-2)			13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10		
Proliant 1000 486DX2/66, 1000R				13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63		
Proliant 1000 5/60, 2000 486/50, 5/66, 90, 2000R Kit					17-09-8016 £119 £139.83	17-09-8032 £195 £229.13	17-09-8064 £375 £440.63	17-09-8088 £725 £851.88
Proliant 4000 486/50, 4000 5/66, 90, 100, 4000R 5/66, 5/100, 4500 133, 4500R Kit					17-09-8016 £119 £139.83	17-09-8032 £195 £229.13	17-09-8064 £375 £440.63	17-09-8088 £725 £851.88
Proliant 1500 & 1500R 5/75, 100, 120 Kit			17-09-0808 £55 £64.63	17-09-0816 £119 £139.83	17-09-0832 £195 £229.13	17-09-8064 £375 £440.63		
Prolinea 3/25s, 3/25s Kit	17-09-0002 £35 £41.13		17-09-0004 £79 £92.83					
Prolinea Ner 1/25s, 33s		17-09-0102 £47 £55.23	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05				
Prolinea 4/25s, 33, 33s, 50, 66 CDS	17-09-0101 £34 £39.95	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3217 £135 £158.63		
Prolinea Desktop 450, 466, 4100		17-09-0102 £39 £45.83	13-97-0407 £15 £17.63	13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98		
Prolinea 575, 590, 5100, 5133 Series (Kit-2)				13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10	
Prolinea 575s, MX, 590MX, 5100e, 5120e, MX Series (Kit-2)				13-97-0807 £24 £28.20	13-97-1607 £53 £62.28	13-97-3207 £97 £113.98	00-00-0000 £332 £390.10	
Prolinea MT 4/33s, 50, 66	17-09-0102 £39 £45.83	13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3207 £97 £113.98			
Prosignia PC Server 486/33, 486DX2/66		17-30-9204 £37 £43.48	13-97-0817 £46 £54.05	13-97-1617 £68 £79.90	13-97-3207 £97 £113.98			
Prosignia 300 5/75, 5/90, 5/120, 500 5/90 Kit			17-09-0808 £55 £64.63	17-09-0816 £95 £111.63	17-09-0832 £169 £198.58	00-00-0000 £POA £POA		
Prosignia VS 486SV/33, DV/33, DX2/66		13-97-0417 £21 £24.68	13-97-0817 £46 £54.05	17-09-6216 £96 £112.80	17-09-6232 £199 £233.83			



SMC'S 5 YEAR WARRANTY PROVES THE QUALITY OF ALL MEMORY SUPPLIED



Not sure which module to use ?

Our sales staff can quickly identify the right memory for your system. Call SMC for the best in memory upgrades.

30 PIN SIMM ACTUAL SIZE. CHIP CONFIGURATIONS MAY VARY.

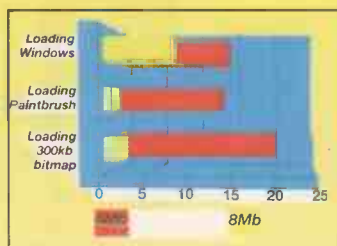


Being the Best takes power

SALES HOTLINE TEL 01753 550333
SALES FAX 01753 524443
WORLD CLASS SERVICE & PERFORMANCE



The difference 4MB makes



To find out the difference that 4Mb of memory can make, SMC conducted a series of tests using one of its own 486DX2-66 PCs. The results were startling. As the graph above shows, adding just 4Mb of memory to the system resulted in a dramatic speed increase.

With more and more power hungry software packages being released every day, it makes sense to consider a memory upgrade now. To find out how even a small increase in your PC's RAM capabilities can dramatically improve its performance, call our Technical Sales line today.



Static Electricity WARNING

Memory modules and processor chips are particularly sensitive to static electricity and can easily be damaged. When fitting memory you should ensure that you have discharged any static. The most effective way of ensuring this is to wear an anti static wrist strap. Alternatively you can touch the casing of your PC (provided it is connected to the mains but NOT turned on.)

Anti-Static Wrist Strap

Anti-static wrist-straps will protect your memory modules during installation - earthing your body by connecting it with a metal object such as your PC. These straps are free and available on request from SMC when ordering your memory modules.

DELL MEMORY

SYSTEMS

	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb
4000/XE Series 486/3350,66 Kit				17-20-1208 £129 £151.58		00-00-0000 £370 £434.75	13-97-3217 x2 £430 £505.25
Dimension 425s, 433/s/450i, 466i, XPS 450V, 466V			13-97-0407 £15 £17.63		17-20-1416 £77 £90.48		
Dimension XPS 486 Midsize 466, 4100			13-97-0407 £15 £17.63		17-20-1416 £77 £90.48		
Dimension XPS P60 FS (Kit-2)				17-20-3108 £49 £57.58	17-20-1416 £77 £90.48	17-20-3132 £199 £233.83	00-00-0000 £530 £622.75
Dimension XPS P60, P90, P100, C, P120C/T (Kit-2)			17-20-1704 £29 £34.08	17-20-3108 £49 £57.58	17-20-1716 £79 £92.83	17-20-3132 £199 £233.83	
Dimension P75T, P90T etc., E00 Kits				00-00-0000 £44 £51.70	00-00-0000 £80 £94.00	00-00-0000 £164 £192.70	00-00-0000 £336 £394.80
Low Profile Power Desktop 486 P Series			13-97-0418 £34 £39.95		13-97-1617 £96 £112.80		
NetPlex 486/25s, 33s, 33d, 50d, 66d			13-97-0407 £15 £17.63	17-20-3108 £49 £57.58	17-20-1416 £77 £90.48		
OmniPlex 433ME, 450ME, 466ME, 4100ME			13-97-0407 £15 £17.63	17-20-3108 £49 £57.58	17-20-1416 £77 £90.48	17-20-3132 £199 £233.83	
OmniPlex 560/ME, 566/ME, 590/ME Kit				17-20-1208 £129 £151.58	13-97-0817 x2 £238 £279.65	00-00-0000 £370 £434.75	13-97-3217 x2 £430 £505.25
OptiPlex 433/e, 450/e, 466/e, 4100/e, 466/L(E)			13-97-0407 £15 £17.63		17-20-1416 £77 £90.48		
OptiPlex (V) Series 486 s/L, s/M, MX, MX Series				13-97-0407 £15 £17.63	17-20-1416 £77 £90.48		
OptoPlex DGX 590, 5100, 5120, 5133 Kit				17-20-1208 £129 £151.58	00-00-0000 £238 £279.65	00-00-0000 £370 £434.75	00-00-0000 £474 £556.95
Optiplex XL/MX/MT 575, 590, 5100, 5120, 5133 (Kit-2)			17-20-1704 £29 £34.08	17-20-3108 £49 £57.58	13-97-1607 £130 £152.75	17-20-3132 £298 £350.15	00-00-0000 £530 £622.75
Performance 486 s/L, s/M, M.T Series			00-00-0000 £20 £23.50		17-20-1416 £77 £90.48		
Performance 425s/ME, 433/ME, 433s/ME, 450/ME, 466/ME Kit			17-20-1204 £49 £57.58	17-20-1208 £69 £81.08	17-20-1216 £99 £116.33	00-00-0000 £370 £434.75	
Power Desktop 486 D Series			00-00-0000 £34 £39.95		13-97-1617 £96 £112.80		
PowerEdge SP 433, 450, 466 Kit				17-20-1208 £69 £81.08	13-97-0817 x2 £238 £279.65	00-00-0000 £370 £434.75	13-97-3217 x2 £430 £505.25
PowerEdge SP 560, 566, 590, 5100 Pentium Series Kit				17-20-1208 £69 £81.08	13-97-0817 x2 £238 £279.65	00-00-0000 £370 £434.75	13-97-3217 x2 £430 £505.25
PowerEdge XE 433, 433s, 450, 466			00-00-0000 £20 £23.50	17-20-3108 £49 £57.58	17-20-1416 £155 £182.13	17-20-3132 £265 £311.38	
PowerEdge XE 560, 566, 590, 5100 Kit				17-20-1208 £69 £81.08	13-97-0817 x2 £238 £279.65	00-00-0000 £370 £434.75	13-97-3217 x2 £430 £505.25
Powerline Workstation 486 DE, DE/2 Series Kit			17-20-1004 £79 £92.83	17-20-1008 £95 £111.63	17-20-1016 £169 £198.58		
Powerline Workstation 486 SE, SE/2 Series Kit			17-20-1002 £63 £74.03	17-20-1004 £77 £90.43	17-20-1008 £85 £99.88	17-20-1016 £149 £175.08	
Precision 486			13-97-0407 £15 £17.63		13-97-1607 £78 £91.65		
System 316SX, 320SX (Rev.1), 325SX Kit			17-20-0202 £35 £41.33				
System 320SX (Rev.2), 3250/P, 333D/P, 433P			17-20-0501 £35 £41.13		13-97-0418 £34 £39.95		
System 425TE, 433TE Kit				17-20-1004 £79 £92.83	17-20-1008 £95 £111.63	17-20-1016 £169 £198.58	

LAPTOPS

	2Mb	4Mb	8Mb	16Mb
System 316LT, 320LT, 320LX Kit	17-20-0202 £35 £41.13			
System 325N, 325NC	17-20-0602 £95 £111.63			
Latitude M 433m/mc, 450m/mc, 475m Series		17-20-5104 £63 £74.08	00-00-0000 £159 £186.83	17-20-5116 £172 £202.10
Latitude 425, 433, 450 a/bx Series Kit		17-20-5104 £63 £74.03		17-20-5116 £172 £202.10
Latitude LX 475D, 4100D, 4100T		00-00-0000 £POA	00-00-0000 £POA	00-00-0000 £POA
Latitude XP 450C, 475C, 4100CX		00-00-0000 £POA	17-20-5308 £78 £91.65	17-20-5316 £155 £182.13
Latitude XPI P75, P90, P90ST, P120		00-00-0000 £POA	17-20-5608 £78 £91.65	17-20-5316 £155 £182.13

Not sure which module to use ?

Our sales staff can quickly identify the right memory for your system. Call SMC for the best in memory upgrades.

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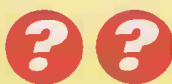
TOSHIBA MEMORY

LAPTOPS	Ex VAT Inc VAT					
	2Mb	4Mb	8Mb	16Mb	24Mb	32Mb
Portage 610CT/Satellite Pro 410, 415			00-00-0000 £89 £104.58	00-00-0000 £259 £304.33		00-00-0000 £495 £581.63
Satellite 100, 105 Series			17-75-6108 £89 £104.58	17-75-6116 £259 £304.33		17-75-6132 £495 £581.63
Satellite PRO 400, 405 Series			17-75-6108 £89 £104.58	17-75-6116 £259 £304.33		17-75-6132 £495 £581.63
T1000LE	17-75-1302 £59 £69.33	17-75-2004 £54 £63.45	17-75-2008 £82 £96.35			
T1000SE, T1000XE	17-75-1302 £55 £64.63					
T1600	17-75-1202 £69 £81.08					
T1800, T1850, T1850x	17-75-1002 £57 £66.98	17-75-2004 £54 £63.45	17-75-2008 £82 £96.35			
T1900, C, T1910, CS, T1950, C, CS, CT, T1960C, CS, CT		17-75-1904 £47 £55.23	17-75-1908 £59 £69.33	17-75-1916 £129 £151.58		
T200, T200CS (Dynapod)		17-75-1904 £47 £55.23	17-75-1908 £59 £69.33	17-75-1916 £129 £151.58		
T2000, T2000SX	17-75-1002 £57 £66.98	17-75-2004 £54 £63.45	17-75-2008 £82 £96.35			
T2000Sx, T2200SX	17-75-1002 £57 £66.98	17-75-2004 £54 £63.45	17-75-2008 £145 £170.38			
T2100, CS, CT, T2105, CS, CT, T2150C05, CD, T2155 CDS		17-75-2104 £44 £51.70	17-75-2108 £56 £65.80	17-75-2116 £86 £101.05	17-75-2124 £197 £231.48	
T2110, T2115, T2130, T2150		17-75-2104 £44 £51.70	17-75-2108 £54 £65.80	17-75-2116 £86 £101.05	17-75-2124 £197 £231.48	
T2400CS, CT, T2450CT (24Mb, T2450 only)		17-75-3604 £56 £65.80	17-75-3608 £73 £85.78	17-75-3516 £166 £195.05	00-00-0000 £POA £POA	
T3100e	17-75-3202 £51 £59.93					
T3100SX	17-75-3002 £75 £88.13	17-75-3004 £53 £62.288				
T3200, T3200SX	17-75-3102 £59 £69.33	17-75-3304 £58 £66.15				
T3200SXC	17-75-3202 £52 £61.10	17-75-3204 £57 £66.98				
T3300 SL		00-00-0000 £POA £POA		17-75-3408 £177 £207.98		
T3400, CT, T3600CT		17-75-3604 £65 £76.38	17-75-3608 £85 £99.88	17-75-3616 £245 £287.88		
T4400SX, Sx, C, Dx, C, Sx	17-75-4402 £68 £79.90	17-75-4404 £79 £92.83	17-75-4408 £88 £103.40	17-75-4416 £144 £169.20		17-75-4432 £439 £515.83
T4500, C, T4600, C, T4700CS, CT, T4800CT, T485CT, 4900CT		17-75-1904 £49 £57.58	17-75-1908 £59 £69.33	17-75-1916 £129 £151.58		17-75-4732 £1099 £1291.33
T5200, C, T5200/100, 200	17-75-5202 £65 £76.38		17-75-5208 £89 £104.58			
T6400SX, Sx, Dx, DxC	17-75-4402 £68 £79.90	17-75-4404 £79 £92.83	17-75-4408 £88 £103.40	17-75-4416 £144 £169.20		17-75-4432 £439 £515.83
T6600C, C/CD, C/CDV		17-75-4404 £89 £104.58	17-75-4408 £185 £217.38	17-75-4416 £235 £276.13		17-75-4432 £439 £515.83
T8500 Desktop	17-75-5202 £65 £76.38		17-75-5208 £89 £104.58			
TECRA 500CS, 500COT Series			17-75-6508 £185 £217.38	17-75-6516 £229 £269.08		17-75-6532 £299 £351.33
TECRA 700CS, 700COT Series			17-75-6308 £139 £163.33	17-75-6316 £227 £266.73		17-75-6332 £386 £453.55
TECRA 710 / 720 Series			17-75-6108 £69 £81.08	17-75-6116 £129 £151.58		17-75-6132 £222 £260.85

INFORMATION

Windows '95 requires a minimum of 8Mb of RAM memory. An upgrade now will do wonders for your systems performance.

'BP' memory simulates parity with 'logic parity' and may cause compatibility problems with some systems that require standard 9bit or 36bit SIMM's that have full parity, self checking built in. Check system requirements, or ask your sales contact who can advise you.



Not sure which module to use?

Our sales staff can quickly identify the right memory for your system. Call SMC for the best in memory upgrades.

Intel overdrive options for many of the systems listed.



Please call for details and prices



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MOTHERBOARDS - 486

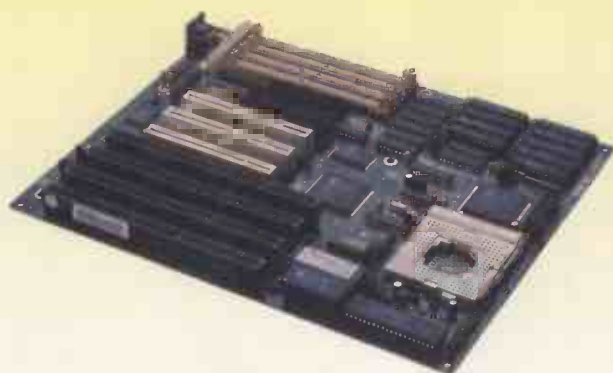
486 PCI motherboards are fitted with Controllers for Floppy Drives, 4 EIDE devices, 1 Enhanced Parallel and Fast Serial Ports.

MOTHERBOARDS - TMC 486

Ex VAT Inc VAT

07-97-0571 **PCI MOTHERBOARD** TMC 3 x PCI Bus, 4 x ISA Bus 486 CPU, B socket, ALU Chipset, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb cache

£65
£76.38



"THE NAME 'TRITON' IS NOT A TRADEMARK OF INTEL CORPORATION"

MOTHERBOARDS - PENTIUM / PENTIUM PRO / ATX / ATX DUAL PENTIUM

All Pentium motherboards are fitted with controllers for Floppy Drives, 4 EIDE devices, 1 Enhanced Parallel & Fast Serial Ports. They all support pairs of 32bit, 36bit or EDO SIMMs. Windows 95 Plug & Play.

MOTHERBOARDS - TMC PENTIUM

Ex VAT Inc VAT

07-97-5177

TMC 4 x PCI Bus, 3 x ISA Bus, Pentium CPU, C socket 7, **Intel VX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Burst Pipeline cache. SDRAM socket.
(TMC 512Kb cache upgrade - part no. 07-95-0259)

£79
£92.83

07-97-5175

TMC 4 x PCI Bus, 3 x ISA Bus, Pentium CPU, C socket 7, **Intel Triton II HX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Burst Pipeline cache, upgradable to 512Kb with separate CELP socket.
(TMC 512k upgrade part no. 07-95-0257)

£89
£104.58

TMC PENTIUM PRO

Ex VAT Inc VAT

07-97-5801

TMC 4 x PCI Bus, 4 x ISA Bus, Pentium CPU, C socket 8, **Intel FX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Burst Pipeline cache. SDRAM socket.
(TMC 512Kb cache upgrade - part no. 07-95-0259)

£169
£198.58

MOTHERBOARDS - PENTIUM

All Pentium motherboards are fitted with controllers for Floppy Drives, 4 EIDE devices, 1 Enhanced Parallel & Fast Serial Ports. They all support pairs of 32bit, 36bit or EDO SIMMs. Windows 95 Plug & Play.

MOTHERBOARDS - INTEL PENTIUM

Ex VAT Inc VAT

07-31-2031 **Intel 'Marl' ATX*** - P75-P200 Pentium CPU, C socket 7, 3 x PCI, 2 x ISA, 1 x shared PCI/ISA Bus, Intel Triton II, **HX Chipset**, AMI BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Pipeline Burst cache soldered on, no additional CELP socket.

£105
£123.38

07-31-2041 **Intel 'Tucson' ATX*** - P75-P200

£119 **£139.83**

MOTHERBOARDS - PENTIUM PRO

MOTHERBOARDS - INTEL PENTIUM

Ex VAT Inc VAT

07-31-2051 **Intel 'Venus' ATX*** - Pentium Pro Socket 8, D Socket, 150/180/200MHz, 4 x 72 pin SIMM, 128 Mb max memory, 4 x PCI 2/3 ISA Slots, Intel Natoma chipset, PS2 Mouse/Motherboard style connector, 2 x Serial, 1 x Parallel Port.

£179
£210.33

Cache memory for Atlantis, Endeavour, TMC only available when purchasing Motherboard.

07-95-0251 - 256Kb Asynchronous	£20	£23.50
07-95-0253 - 256Kb Pipeline burst	£22	£25.85
07-95-0259 - 256Kb Pipeline burst for 07-97-5177 M/board	£25	£29.38
07-97-0257 - 256Kb Pipeline burst for 07-97-5175 M/board	£25	£29.38
07-95-0513 - 512Kb Pipeline burst	£35	£41.13

CPU SOCKET TYPES

A = ZIF-DX2 + Pentium Overdrive. B = ZIF-DX4 + Pentium Overdrive.
C = Pentium processor. D = Pentium Pro Processor.

***ATX MOTHERBOARDS REQUIRE ATX CASES
SEE PAGE 31 FOR RANGE AND SPECIFICATIONS**

TMC ATX PENTIUM

Ex VAT Inc VAT

07-97-5775

TMC 4 x PCI Bus, 4 x ISA Bus, Pentium CPU, C socket 7, **Intel HX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Level 2 cache. SDRAM socket.
(TMC 512Kb cache upgrade - part no. 07-95-0259)

£99
£116.33

07-97-5777

TMC 4 x PCI Bus, 3 x ISA Bus, Pentium CPU, C socket 7, **Intel VX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Level 2 cache. SDRAM socket. 2x 168pin DIMM sockets
(TMC 512Kb cache upgrade - part no. 07-95-0259)

£88
£103.40

TMC ATX DUAL PENTIUM

Ex VAT Inc VAT

07-97-5799

TMC 4 x PCI Bus, 3 x ISA Bus, 2X Pentium CPU, C socket 7, **Intel HX Chipset**, AMI/Award BIOS, 4 x 72 pin, 128Mb max memory, 256Kb Level 2 cache. SDRAM socket.
(TMC 512Kb cache upgrade - part no. 07-95-0259)

£199
£233.83

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INTEL OVERDRIVE PROCESSORS

PENTIUM P75,P90,P100 (3V)

	Ex VAT	Inc VAT
09-31-5123 Pentium 125Mhz OverDrive, 296-pin, 3v, built on fan, for a PENTIUM running at 75Mhz with a Socket 5 or 7 ZIF	£164	£192.70
09-31-5153 Pentium 150Mhz OverDrive, 296-pin, 3v, built on fan, for a PENTIUM running at 90Mhz with a Socket 5 or 7 ZIF	£205	£240.88
09-31-5163 Pentium 166Mhz OverDrive, 296-pin, 3v, built on fan, for a PENTIUM running at 100Mhz with a Socket 5 or 7 ZIF <i>FOR PENTIUM P75, P90, P100 BASED SYSTEMS (3V)</i>	£285	£334.88

PENTIUM P60/P66 (5V)

	Ex VAT	Inc VAT
09-31-5105 Pentium 120/133Mhz OverDrive, 273-pin, 5v, built on fan, for a PENTIUM running at 60 or 66Mhz with a Socket 4 ZIF <i>For Pentium P60, P66 based systems (5v)</i>	£164	£192.70

486 OVERDRIVE CPU's

	Ex VAT	Inc VAT
09-31-6075 75Mhz DX-4 486 OverDrive, 169-pin, 5v, built on fan, for a 486 running at 25Mhz with a Single socket	£85	£99.88
09-31-8075 75Mhz DX-4 486 OverDrive, 169-pin, 5v, built on fan, for a 486 running at 25Mhz with a Dual socket (Overdrive socket)	£87	£102.23
09-31-6100 100Mhz DX-4 486 OverDrive, 169-pin, 5v, built on fan, for a 486 running at 33Mhz with a Single socket	£108	£126.90
09-31-8100 100Mhz DX-4 486 OverDrive, 169-pin, 5v, built on fan, for a 486 running at 33Mhz with a Dual socket (Overdrive socket)	£107	£125.73

PENTIUM 486 OVERDRIVE CPU's

	Ex VAT	Inc VAT
09-31-5063 63Mhz Pentium OverDrive, P24T 238-pin, 5v, built on fan, from a 486 PC running at 25Mhz with Socket 3 or a ZIF socket	£89	£104.58
09-31-5083 83Mhz Pentium OverDrive, P24T 238-pin, 5v, built on fan, from a 486 PC running at 33Mhz with Socket 3 or a ZIF socket	£119	£139.83

STEP 1



STEP 2



STEP 3



STEP 4



UPGRADE PATH



PROCESSORS

PENTIUM PRO PROCESSORS

	Ex VAT	Inc VAT
09-31-3200 Intel Pentium Pro 200Mhz - with 256k cache	£388	£455.90

PENTIUM & MMX PROCESSORS

	Ex VAT	Inc VAT
09-17-5106 Cyrix 6X86-100 - P120+, 296-pin, 3.3v	£65	£76.38
09-17-5126 Cyrix 6X86-120 - P150+, 296-pin, 3.3v	£85	£99.88
09-17-5136 Cyrix 6X86-133 - P166+, 296-pin, 3.3v	£119	£139.83
09-31-2120 Intel Pentium P120 - 120Mhz, 296-pin, 3.3v	£79	£92.83
09-31-2133 Intel Pentium P133 - 133Mhz, 296-pin, 3.3v	£95	£111.63
09-31-2150 Intel Pentium P150 - 150Mhz, 296-pin, 3.3v	£115	£135.13
09-31-2166 Intel Pentium P166 - 166Mhz, 296-pin, 3.3v	£209	£245.58
09-31-4166 Intel Pentium MMX P166 - 166Mhz, 296-pin, 3.3v	£269	£316.08
09-31-2200 Intel Pentium P200 - 200Mhz, 296-pin, 3.3v	£349	£410.08
09-31-4200 Intel Pentium MMX P200 - 200Mhz, 296-pin, 3.3v	£389	£457.08

486

	Ex VAT	Inc VAT
09-17-4066 Cyrix 486DX2-66 - 66Mhz, 168-pin, 5V	£22	£25.85
09-05-4100 AMD 486DX4-100 - 100Mhz, 168-pin, 3.3v	£25	£29.38
09-17-4105 Cyrix 5X86-100 - 100Mhz, 168-pin, 3.3v	£42	£49.35

HEAT SINKS

	Ex VAT	Inc VAT
09-95-4240 486 processor low profile	£7	£8.23
09-95-5090 Pentium P75 through to P200	£9	£10.58
09-95-6000 Pentium Pro 200	£12	£14.10



With Intel MMX technology, PCs get a new level of multimedia performance and other new capabilities going beyond anything you've experienced before. You'll get:

- vivid sound
- rich colors
- realistic 3D rendering
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DATA - FAX - VOICE - WEB...

If you want to get on the Internet you need a modem - and they don't come any better than the **NEW** US Robotics

Sportster Voice 33,600 Faxmodem

Call discrimination:

The Sportster Voice will automatically detect an incoming fax or voice call and switch functions to it.

Multiple voice mailboxes:

Allows each person in your home or office to retrieve messages conveniently and even listen to their messages at another location.

Fax on demand:

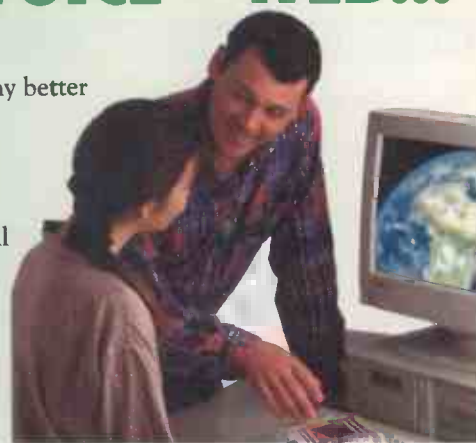
Up to 100 pre-configured faxes can be directed instantly to the callers' fax machine for popular information such as price lists etc.

Hands free telephone:

The speaker phone facility allows the Sportster Voice to be used as a telephone.* *A Soundcard & external speaker or headset is required to utilise all voice features including hands-free.

In the world of modems, it's one of the most impressive performers around, capable of **running up to 33,600bps**. Which is why SMC has come up with an equally impressive price.

£133 Ex.VAT
Inc VAT £156.28



MODEMS

Ex VAT Inc VAT

US Robotics - SPORTSTER Range - 5YR Warranty, free Lifetime tech. support

Features and benefits - Compact, easy to use products designed to offer the fastest connection to the outside world. Based on an Award winning series - their performance, features, reliability & low price are hard to beat.

91-79-1442 Sportster 14.4, 14,400bps Data/Fax Speed, Internal with Data and Fax software	£76	£89.30
91-79-2892 Sportster 33.6 Voice, 33,600bps Data Speed, Internal 14,400bps Fax Speed, with Data and Fax software	£133	£156.28
91-79-1466 Sportster 14.4 V1, 14,400bps Data/Fax Speed, External personal voice messaging (with voice mail/Data/Fax/Internet software & cables)	£76	£89.30
91-79-2896 Sportster 33.6 Voice, 33,600bps max. Data Speed, External 14,400bps Fax Speed, (with voice mail/Data/Fax/Internet software & cables)	£133	£156.28
91-79-4288 Sportster 28.8 PCMCIA XJACK, 28,800bps Data Speed, 14,400bps Fax Speed uses standard PCMCIA Type II/III slot, inc. software	£131	£153.99

US Robotics - COURIER Range - 5YR Warranty, free Lifetime tech. support

Features and benefits - Dial security with passwords for optimum security, Adaptive Speed Levelling (reduces speed in the transmit & receive channels when line conditions are poor), automatic Fax/Data selection, Universal Connect - automatically detects & connects at the fastest speed. Upgradable flash memory. For the communications professional looking for advanced performance at an affordable price - the COURIER delivers.

91-79-3402 Courier Dual Standard V34 + Fax, 33,600bps Data Speed, Internal 14,400bps Fax Speed, with Data and Fax software	£197	£231.48
91-79-3406 Courier Dual Standard V34 + Fax, 33,600bps Data Speed, External 14,400bps Fax Speed, with Data and Fax software	£197	£231.48

Creative Labs

57-15-5111 Creative Labs PhoneBlaster message centre, 28,800bps, with built in 16-bit stereo, Voice mail & music on hold. IDE CD int., 14,400bps Fax Speed, Internal

91-91-1342 Linnet 34FX, 28.8Kbps Data Speed, 14,400bps Fax Speed, External	£135	£158.63
91-91-1340 Linnet 34FX, 28.8Kbps Data Speed, 14,400bps Fax Speed, Internal	£149	£175.08
91-91-3604 Microlin NB34 PCMCIA, 28,800bps Data Speed, 14,400bps Fax Speed, External	£135	£158.63
91-91-1362 Message Desk 34, 28.8Kbps Data, 14.4Kbps Fax Speed & Voice, External	£149	£175.08

MODEMS

Ex VAT Inc VAT

Pace

91-91-1360 Message Desk 34, 28.8Kbps Data, 14.4Kbps Fax Speed & Voice, Internal	£142	£166.85
91-91-2022 Netlink Gold, 28,800bps Data Speed, 14.4Kbps Fax Speed, Internet Bundle, External	£85	£99.88
91-91-2020 Netlink Gold, 28,800bps Data Speed, 14.4Kbps Fax Speed, Internet Bundle, Internal	£119	£139.83

Modular Technology

91-97-2400 V32 Plus Fax, 14,400bps Data/Fax Speed, External	£115	£135.13
91-97-2402 V32 Plus PC, 14,400bps Data/Fax Speed, External	£115	£135.13
91-97-2620 V34 Plus Fax, 28,800bps Data Speed, 14,400bps Fax Speed, External	£199	£238.83
91-97-2622 V34 Plus PC, 28,800bps Data Speed, 14,400bps Fax Speed, External	£205	£240.88
91-97-2624 V34 Plus PCMCIA, 28,800bps Data Speed, 14,400bps Fax Speed, External	£185	£217.38

Motorola

91-97-5128 3400 Online, 28,800bps Data Speed, 14,400bps Fax Speed (with Internet Software), External	£99	£116.33
91-97-5328 3400 Pro, 28,800bps Data Speed, 14,400bps Fax Speed, External	£93	£109.28

Hays

91-95-1314 Accura 14.4, 14,400bps Data/Fax Speed, External	£77	£90.48
91-95-1328 Accura 28.8, 28,800bps Data Speed, 14,400bps Fax Speed, External	£99	£116.33

NETWORK CABLES

Ex VAT Inc VAT

86-95-1371 Thin Ethernet cable, segments made to order	£0.90/metre	£1.06
86-95-1311 BNC solderless crimp connectors	£2.50	£2.94
86-95-1353 BNC Ethernet terminator	£5	£5.88
86-95-1331 BNC T piece	£6	£7.05

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NETWORK CARDS

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	BNC	TP	COMBO	
NOVELL				
84-91-2011 Novell NE 2000+ - 16-bit ISA Bus, for workstations/small servers	£49	£57.58		
SMC				
SMC E16 - 16-bit ISA Bus, for workstations/small servers	84-93-1611 £55	84-93-1631 £64.63	84-93-1651 £56	£65.80
	84-93-2411 £58		84-93-2451 £65	£76.38
SMC EZ P'n P - 16-bit ISA Bus, for workstations/small servers	£58	£68.15		
84-93-3211 SMC E32 - EISA Bus, for high end workstations/servers	£139	£163.33		
84-93-1811 SMC E16MCA - MCA Bus, for IBM workstations/small servers	£125	£146.88		
3COM				
3COM 509 - 16-bit ISA Bus, for high end workstations/servers		84-90-0931 £65	84-90-0951 £76.38	£75 £88.13
84-90-8951 3COM 589 - PCMCIA Bus, for laptops				£129 £151.58
84-90-9951 3COM 900 - PCI Bus, for high end workstations/servers				£99 £116.33
00-00-0000 3COM 595 - PCI Bus, for high end workstations/servers				£POA £POA
COMPEX				
00-00-0000 Compex V16 - 16-bit ISA Bus, for workstations/small servers.	£33	£38.78		



KEYBOARDS & MICE

	Ex VAT		Inc VAT	
KEYBOARDS				
GENERIC				
82-50-3505 iFor Windows 95 - 105 keys, 5-pin DIN connector	£19	£22.33		
CHERRY				
82-91-3595 Cherry 681 3000 Lamb - 105 keys, 5-pin DIN connector, soft touch	£27	£31.73		
82-91-3597 Cherry 680 - 3000HFM - AT, 102 keys, 6-pin DIN connector, click touch	£45	£52.88		
82-91-3599 Cherry 680 3000 HPM-PS/2 AT, 105 keys, 5-pin DIN connector, click touch	£48	£56.40		
MICE				
GENERIC				
82-53-3151 Mouse - 9 pin serial, 2 buttons	£11	£12.93		
MICROSOFT				
82-50-3192 Microsoft 'Home' - 9 pin serial, 2 buttons	£25	£29.38		
LOGITECH				
82-97-1511 Pilot Mouse, New shape - 9-pin serial, 3 buttons	£16	£18.80		
82-97-1531 MouseMan 96 - 9pin Serial, 3 buttons, designed to be faster for Windows (Win 3.1x & W95) use	£32	£37.60		
82-97-0202 Pilot Trackball - 9-pin serial, 2 buttons, 200dpi	£25	£29.38		
82-97-1317 Trackman Live - 9-pin serial, 3 buttons, 400dpi	£102	£119.85		
82-97-1315 Trackman Portable - 9-pin serial, 3 buttons, 200dpi	£32	£37.60		
82-97-1319 Trackman Vista - 9-pin serial, 3 buttons, 320dpi	£42	£49.35		
82-97-1313 Trackman Voyager - 9-pin serial, 3 buttons, 250dpi	£45	£52.88		

PC CASES (All cases are CE Approved)

	Ex VAT		Inc VAT	
70-97-0300 Super-Slimline Desktop, 100w PSU, 2 x 3.5" bays (ISA use only)	£52	£61.10		
70-97-0500 Slimline Desktop, 200w PSU, 2 x 3.5" bays, 2 x 5.25" bays (ISA use only)	£49	£57.58		
70-97-1000 Standard Desktop, 200w PSU, 2 x 3.5" bays, 3 x 5.25" bays	£39	£45.83		
70-97-1510 Mini Tower, 200w PSU, 3 x 3.5" bays, 2 x 5.25" bays	£39	£45.83		
70-97-1730 Midi Tower, 200w PSU, 5 x 3.5" bays, 3 x 5.25" bays	£55	£64.63		
70-97-1910 Full Tower, 200w PSU, 3 x 3.5" bays, 6 x 5.25" bays	£65	£76.38		
70-97-3330 ATX - Desktop, 200w PSU, 2 x 3.5", 3 x 5.25" bays	£POA	£POA		
70-97-3730 ATX - Midi Tower, 200w PSU, 4 x 3.5", 3 x 5.25" bays	£119	£139.83		
70-97-3930 ATX - Full Tower, 200w PSU, 5 x 3.5" low profile, 5 x 5.25" bays	£135	£158.63		



TAPE SELECTOR CHART

	Ex VAT		Inc VAT	
for tape drives listed on pages 20 - 21				
TAPE TYPE				
A 95-95-0805 T1000 (TR1)	£21	£24.68		
B1 95-95-0250 DC2120 unformatted	£8	£9.40		
B2 95-95-0125 DC2120 pre-formatted	£12	£14.10		
C 95-95-0150 DC6150	£10	£11.75		
D 95-95-0250 DC6250	£14	£16.45		
E 95-95-0520 DC6525	£14	£16.45		
F 95-95-1000 DC9100	£23	£27.03		
G 95-95-9409 DAT 4mm 90metre	£7	£8.23		
H 95-95-9412 DAT 4mm 120metre	£14	£16.45		
I 00-00-0000 DC2120XL pre-formatted	£16	£18.80		
J1 95-95-0680 DC3000XL unformatted	£15	£17.63		
J2 00-00-0000 DC3000XL pre-formatted	£22	£25.85		
K 95-95-1365 DC1400	£26	£30.55		
L 95-95-3405 TR3	£25	£29.38		
N 95-95-8005 TR4	£POA	£POA		
M 95-95-4005 DC3080XLF	£26	£30.55		
ACCESSORIES				
95-95-9130 DAT (4mm TCDAT) 4mm Tape Cleaner	£12	£14.10		

SCSI MOUNTING KITS

	Ex VAT		Inc VAT	
for hard drives listed on page 19				
79-97-3502 Removable drive caddy for 3.5" drives. Requires 5.25" mounting bay.	£39	£45.83		
79-97-3504 Metal version of above plus high performance drive support.	£69	£81.08		
79-95-1135 Mounts 3.5" drive into a 5.25" bay. All screws supplied. No slide rails.	£10	£11.75		

IDE/EIDE MOUNTING KITS

	Ex VAT		Inc VAT	
for hard drives listed on page 17				
79-97-3102 Removable drive caddy for 3.5" drives. Requires 5.25" mounting bay.	£35	£41.13		
79-95-1135 - Mounts 3.5" drive into a 5.25" bay. All screws supplied. No slide rails.	£10	£11.75		

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 8Mb 64Mb
 16Mb 128Mb

MEMORY TYPE

- Non-Parity
 Parity
 EDO
 SDRAM (VX Chipset)

SOUND CARD

- SoundBlaster**
 SB16+ - PNP
 SB32+ - PNP
 AWE32+ - PNP
 Other (please specify)

MONITORS

All monitors are SVGA non-interlaced

- 14" 15"
 17" 20"
 21" Other (please specify)

HARD DRIVE

Interface

- | | |
|--------------------------------|--------------------------|
| EIDE | SCSI-2 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> 1.0Gb | <input type="checkbox"/> |
| <input type="checkbox"/> 1.2Gb | <input type="checkbox"/> |
| <input type="checkbox"/> 1.7Gb | <input type="checkbox"/> |
| <input type="checkbox"/> 2.1Gb | <input type="checkbox"/> |
| <input type="checkbox"/> 2.5Gb | <input type="checkbox"/> |
| <input type="checkbox"/> 4.3Gb | <input type="checkbox"/> |

Other (please specify)

PROCESSOR

- 486**
 DX2-66
 DX4-100
Intel Pentium®
 P100 P150
 P120 P166
 P133 P200

FLOPPY DRIVE

- 3.5" DUAL

CD ROM DRIVE

Interface

- | | |
|------------------------------------|--------------------------|
| EIDE | SCSI-2 |
| <input type="checkbox"/> 8X Speed | <input type="checkbox"/> |
| <input type="checkbox"/> 10X Speed | <input type="checkbox"/> |
| <input type="checkbox"/> 12X Speed | <input type="checkbox"/> |

CASE

- Desktop
 Mini Tower
 Full Tower

KEYBOARD

- Win 95 Ready 105 Key
 Cherry 105 Key

SPEAKERS

- None
 10 Watt
 80 Watt

MODEM

Internal External

- 14.4Kb/s
 28.8Kb/s

GRAPHICS CARD

- 1Mb DRAM
 2Mb DRAM
 2Mb VRAM
 4Mb VRAM
 2Mb MYSTIQUE
 4Mb MYSTIQUE
 2Mb MILLENIUM
 4Mb MILLENIUM
 Other (please specify)

OPERATING SYSTEM

- DOS-6.22 & Windows 3.11
 Windows 95 (CD)

PRINTER Please specify your choice

Other options

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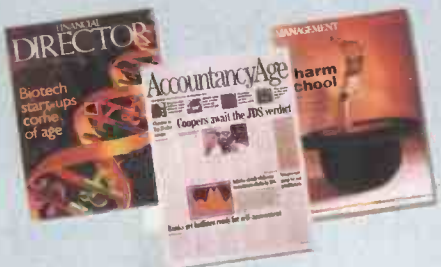
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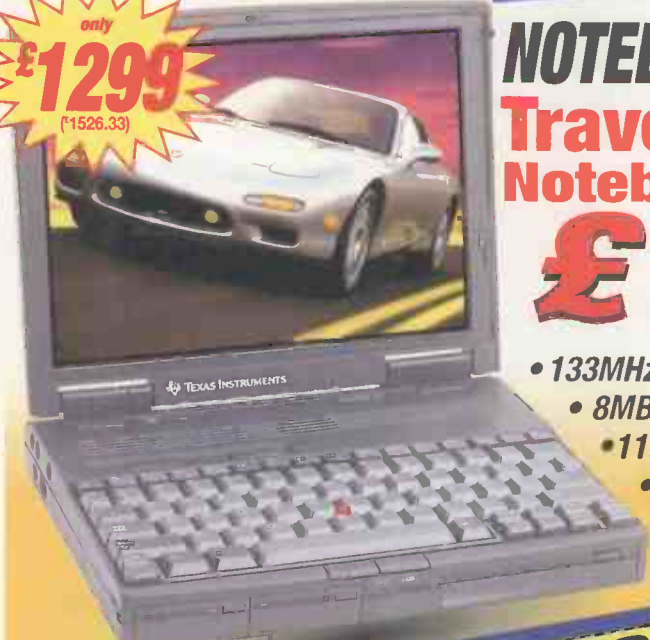
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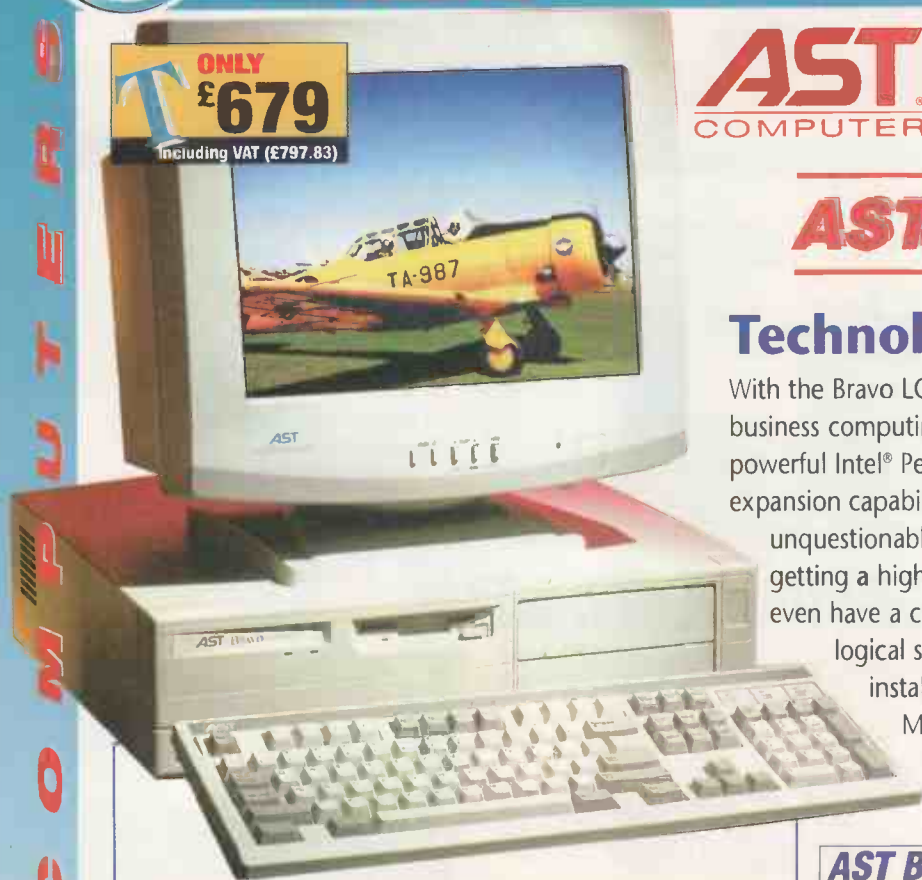
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EURCP3232	Intel P/166	1.2GB	16MB/128MB	Desktop	£849 (997.58)
MY6256	8MB Memory Upgrade for Bravo LC, MS				£99 (116.33)
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Monitor not included

Monitors

No	Model	Size	Pitch	Max Res	Price	Inc VAT
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EURMT0505	AST Vision 5L	15" FST Digital	.28mm	1280 x 1024ni	£239	(280.83)
EURMT0504	AST Vision 7L	17" FST Digital	.28mm	1280 x 1024ni	£475	(558.13)

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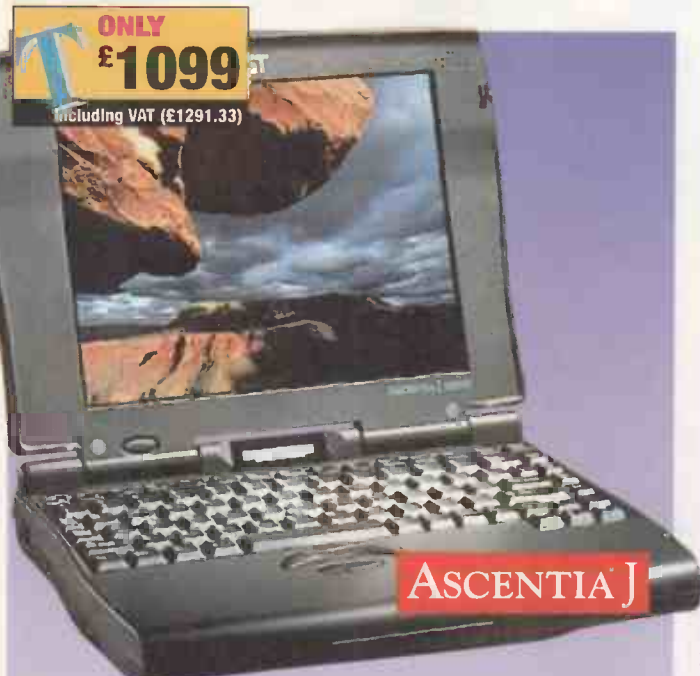


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EURMY1567 8MB Memory Upgrade Module (J20)					£115	(£135.13)	
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CP3756	P41 P/120	2GB	6 X CD-ROM	16MB/40MB	11.3 SVGA TFT	£2379	(£2795.33)
CP3755	P55 P/133	1GB	6 X CD-ROM	24MB/40MB	12.1 SVGA TFT	£2805	(£3296.88)
CP3754	P55 P/133	2GB	6 X CD-ROM	24MB/40MB	12.1 SVGA TFT	£2975	(£3498.83)
EURMY15688MB Memory Upgrade Module						£119	(£135.13)
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CP3802	A42 P/120	1Gb	6 X CD-ROM	16Mb/80Mb	12.1 SVGA DSTN	£1699	(£1996.33)
MY6500	8Mb Memory Upgrade Module					£99	(£116.33)
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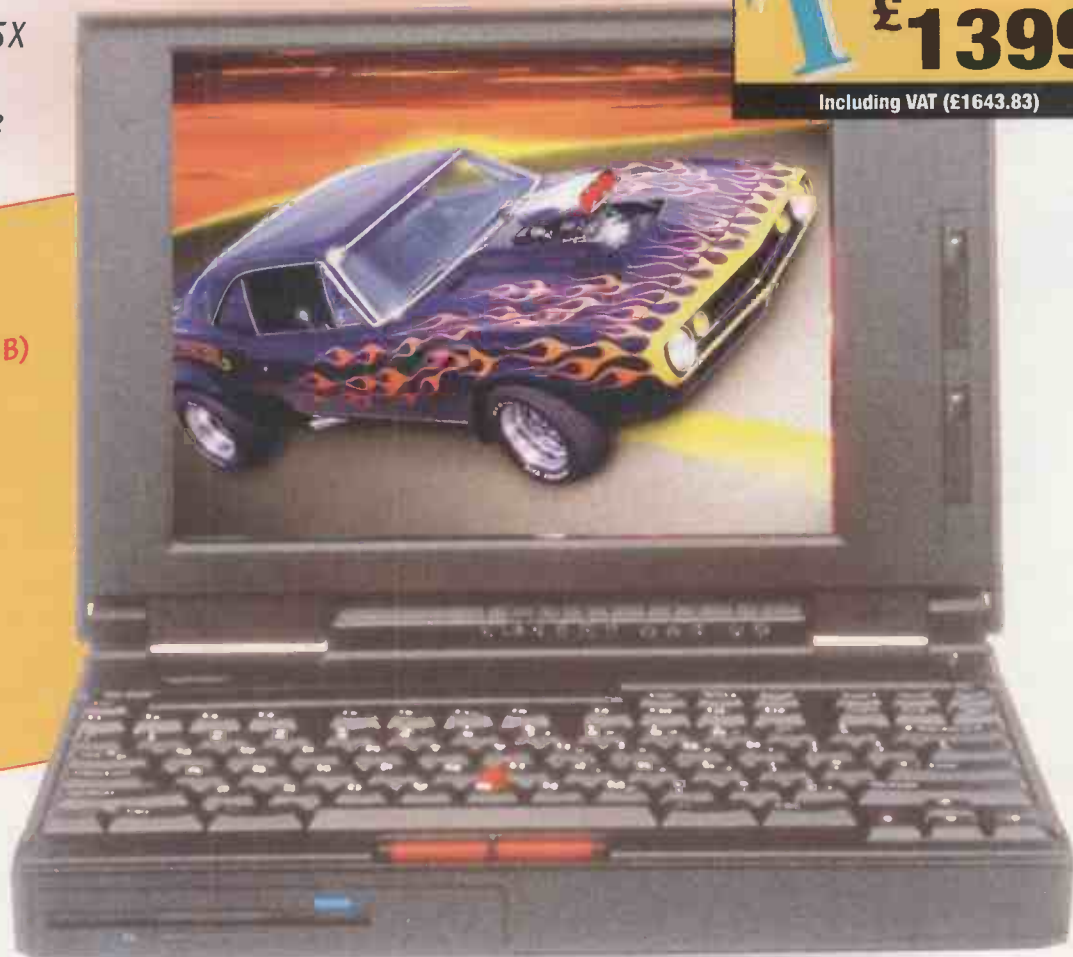
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EURAC2083	1 Year Warranty Upgrade	£79	(£92.18)
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CP3930	365XD 4X9	P/120	810MB	4 X CD-ROM	8MB/40MB	10.4" SVGA TFT	£1999	(£2348.83)
CSR0148	365XD CD9	P/120	1.08GB	4 X CD-ROM	8MB/40MB	10.4" SVGA DSTN	£1565	(£1838.88)
CP4199	365X 2X9	P/133	1.08GB	Optional	8MB/40MB	10.4" SVGA DSTN	£1569	(£1843.58)
CP4198	365XD 1X9	P/133	1.35GB	6 X CD-ROM	8MB/40MB	10.4" SVGA TFT	£2555	(£3002.13)

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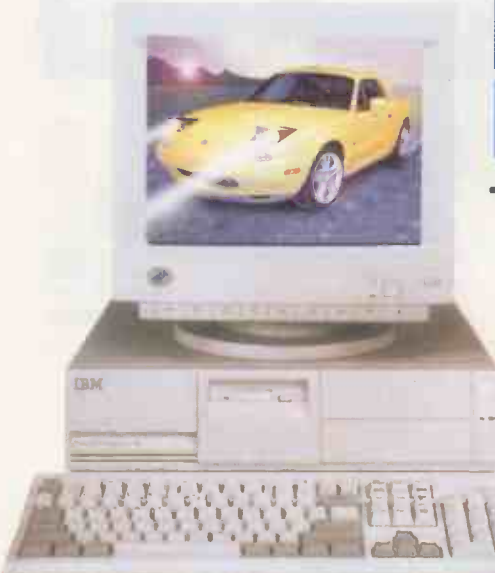
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T **PC50 FROM**
£869
Including VAT (£1021.08)

SKU	CPU	Ram/Max	HDD	CD-ROM	Software	Price	Inc. VAT
PC 340 RANGE							
CP4211	5/100	8MB/128MB	850MB		Win 95	£459	(£539.33)
CP4212	5/100	16MB/128MB	1.2GB	6 X CD-ROM	DOS 7.0/Win 3.1	£665	(£781.38)
CP4205	5/120	16MB/128MB	1.2GB		Win 95	£615	(£722.63)
CP4203	5/133	16MB/128MB	1.2GB	6 X CD-ROM	DOS 7.0/Win 3.1	£765	(£898.88)
CP4201	5/166	16MB/128MB	2.5GB		Win 95	£959	(£1126.83)
PC 330 RANGE							
CP4200	5/120	16MB/192MB	1.2GB		Win 95 or DOS 7.0/Win 3.1	£855	(£1004.63)
CP3476	5/133	16MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1005	(£1180.88)
CP3477	5/166	16MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1225	(£1439.38)
PC 350 RANGE							
CP4214	5/120	16MB/192MB	1.2GB		Win 95 or DOS 7.0/Win 3.1	£869	(£1021.08)
CP4208	5/133	16MB/192MB	1.6GB	6 X CD-ROM	Win 95 or DOS 7.0/Win 3.1	£1125	(£1321.88)
CP4209	5/166	16MB/192MB	1.6GB	6 X CD-ROM	Win 95 or DOS 7.0/Win 3.1	£1345	(£1580.38)
CP4213	5/200	32MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1525	(£1791.88)

SKU	Description	Price	Inc. VAT
MT1322	G40 General Purpose Monitor	£185	(£217.38)
MY0883	G40 General Purpose Monitor	£265	(£311.38)
MT0884	G40 General Purpose Monitor	£555	(£652.13)
MY6270	8MB Memory Upgrade	£59	(£69.33)
MY6267	16MB Memory Upgrade	£119	(£139.83)
MY6710	32MB Memory Upgrade	£209	(£245.58)

Prices do not include Monitor

The IBM ThinkPad Range of Notebook Computers



T **ONLY**
£2965
Including VAT (£3483.88)

T **ONLY**
£2145
Including VAT (£2520.38)



SKU	Item	CPU	HDD	CD-ROM	RAM/Max	Display	Price	Inc. VAT
IBM ThinkPad 365								
CP4121	365X 3X9	P/120	810MB	Optional	8MB/40MB	10.4" SVGA TFT	£1399	(£1643.83)
CP3930	365XD 4X9	P/120	810MB	4 X CD-ROM	8MB/40MB	10.4" SVGA TFT	£1999	(£2348.83)
CSR0148	365XD CD9	P/120	1.08GB	4 X CD-ROM	8MB/40MB	10.4" SVGA DSTN	£1569	(£1838.88)
CP4199	365X 2X9	P/133	1.08GB	Optional	8MB/40MB	10.4" SVGA DSTN	£1569	(£1843.58)
CP4198	365XD 1X9	P/133	1.35GB	6 X CD-ROM	8MB/40MB	10.4" SVGA TFT	£2789	(£3277.08)
IBM ThinkPad 560								
CP4197	560	P/133	1.08GB	Optional	8MB/72MB	10.4" SVGA TFT	£2965	(£3483.88)
CP4320	560	P/133	1.2GB	Optional	8MB/72MB	12.1" SVGA TFT	£CALL	
CP4321	560	P/133	2.1GB	Optional	8MB/72MB	11.3" SVGA DSTN	£CALL	
IBM ThinkPad 760								
CP4195	760 EL X6H	P/120	1.35GB	Optional	8MB/104MB	10.4" SVGA DSTN	£1955	(£2297.13)
CP4194	760 EL WL4	P/133	1.08GB	Optional	8MB/104MB	10.4" SVGA TFT	£2955	(£3472.13)
CP3743UK	760 EL XAG	P/133	2.1GB	Optional	8MB/104MB	10.4" SVGA TFT	£3209	(£3770.58)
CP4191	760 EL X4K	P/133	2.1GB	Optional	8MB/104MB	10.4" SVGA TFT	£3619	(£4252.33)
CP4189	760 E X9B	P/133	2.1GB	Upgradable	8MB/104MB	10.4" XGA TFT	£3619	(£4252.33)
CP4190	760 ED ED9	P/133	1.2GB	6 X CD-ROM	8MB/104MB	10.4" SVGA TFT	£3509	(£4123.08)
CP4188	760 ED X9A	P/133	2.1GB	6 X CD-ROM	8MB/104MB	10.4" XGA TFT	£3835	(£4506.13)

Genuine IBM Memory Options for ThinkPad Notebooks

CSR0147	8MB Memory Upgrade Module	£75	(£88.13)
MY6191	16MB Memory Upgrade Module	£135	(£158.63)
EX7077	365 Port Replicator and Charger	£115	(£135.13)
AC21046	560 Port Replicator	£115	(£135.13)
EX6235	760 Port Replicator I	£115	(£135.13)

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PC340 Desktop

The affordable 4 slot, 4 bay PC 340 gives users IBM know how and excellent specification at a great price.

Features:

- ✓ Intel 100mhz Pentium Processor
- ✓ 8MB EDO RAM (expandable to 128MB)
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- ✓ PCI local bus graphics with 1MB DRAM
- ✓ 4 drive bays (2 free)
- ✓ 4 expansion slots (2xISA, 1xPCI, 1xISA/PCI)
- ✓ PC DOS 7.0/Windows 3.1 pre-loaded
- ✓ Lotus SmartSuite License

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£459
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T **P133 MODEL ONLY**
£699
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The IBM PC 300 Range

The complete IBM PC 300 range offers users a performance family of PCs. With model options to match every computing need from modest to demanding.

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Range Features:

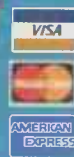
- ✓ 100, 120, 133, 166 and 200mhz Intel Pentium Processors (166 and 200mhz MMX processors also available)
- ✓ 8, 16 or 32MB EDO RAM (expandable to 128MB, 192MB on PC 330 and 350 models)
- ✓ 810MB, 1.2, 1.6 or 2.5GB hard drive
- ✓ 6 X CD-ROM drive on selected models (optional on some models)
- ✓ PCI local bus graphics with 1MB DRAM
- ✓ USB and infrared capability standard on some models
- ✓ PC DOS/Windows 3.1 or Windows 95 pre-loaded
- ✓ Lotus SmartSuite license

SKU	CPU	Ram/Max	HDD	CD-ROM	Software	Price	Inc. VAT
PC 340 RANGE							
CP4211	5/100	8MB/128MB	850MB		Win 95	£459	(£539.33)
CP4212	5/100	16MB/128MB	1.2GB	6 X CD-ROM	DOS 7.0/Win 3.1	£665	(£781.38)
CP4205	5/120	16MB/128MB	1.2GB		Win 95	£615	(£722.63)
CP4203	5/133	16MB/128MB	1.2GB	6 X CD-ROM	DOS 7.0/Win 3.1	£765	(£898.88)
CP4201	5/166	16MB/128MB	2.5GB		Win 95	£959	(£1126.83)
PC 330 RANGE							
CP4200	5/120	16MB/192MB	1.2GB		Win 95 or DOS 7.0/Win 3.1	£855	(£1004.63)
CP3476	5/133	16MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1005	(£1180.88)
CP3477	5/166	16MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1225	(£1439.38)
PC 350 RANGE							
CP4214	5/120	16MB/192MB	1.2GB		Win 95 or DOS 7.0/Win 3.1	£869	(£1021.08)
CP4208	5/133	16MB/192MB	1.6GB	6 X CD-ROM	Win 95 or DOS 7.0/Win 3.1	£1125	(£1321.88)
CP4209	5/166	16MB/192MB	1.6GB	6 X CD-ROM	Win 95 or DOS 7.0/Win 3.1	£1345	(£1580.38)
CP4213	5/200	32MB/192MB	1.6GB		Win 95 or DOS 7.0/Win 3.1	£1525	(£1791.88)

Excluding Monitor

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The HP Vectra Performance PCs with Intel Pentium® Processors inside - ready for Microsoft Windows 95. The new Vectra VL4 range has leading edge components, a high level of base specifications to ensure a good level of future-proofing and out-of-the-box ability to run the latest resource-intensive applications. Monitors are optional.

- ✓ Blazing Fast Intel Pentium® Processors:
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- ✓ 16MB standard, expandable up to 128MB
- ✓ 1.6GB hard drive as standard
- ✓ MS Windows for Workgroups 3.11 preloaded - network ready (Windows 95 option on 16MB models)
- ✓ 256 KB L2 Cache standard
- ✓ PCI architecture with local bus IDE & Graphics (1MB RAM)
 - ✓ Enhanced Master IDE on LB, 64 bit graphics on LB
 - ✓ EDO RAM and synchronous cache for faster performance
 - ✓ 3 year HP warranty (1st year on site)

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Item	Model	Processor	HDD	RAM/MAX	I/O Slots	Price	Inc VAT
EURCP3098	Vectra VL4	Pentium 100	1.2GB	16MBEDO/128MB	2*PCI,2*ISA	£715	£840.13
EURCP3102	Vectra VL4 MT	Pentium 100	1.6GB	16MBEDO/128MB	3*PCI,3*ISA	£819	£962.33
EURCP3093	Vectra VL4	Pentium 120	1.2GB	16MBEDO/128MB	2*PCI,2*ISA	£715	£840.13
EURCP3092	Vectra VL4	Pentium 133	1.2GB	16MBEDO/128MB	2*PCI,2*ISA	£795	£934.13
EURCP3099	Vectra VL4	Pentium 150	1.2GB	16MBEDO/128MB	2*PCI,2*ISA	£935	£1098.63
EURCP3097	Vectra VL4	Pentium 166	1.2GB	16MBEDO/128MB	2*PCI,2*ISA	£1019	£1197.33
MONITOR NOT INCLUDED							
EURMY0452	4MB Memory Upgrade for HP Vectra VL3 Series D2690A					£75	£88.13
EURMY1532	8MB Memory Upgrade for HP Vectra VL4 Series D3646B					£115	£135.13
EURMY1531	16MB Memory Upgrade for HP Vectra VL4 Series D3647B					£235	£276.13



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£715**
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£125**
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HP VECTRA BUNDLES							
Item	Model	Processor	HDD	RAM/MAX	Including Monitor	Price	Inv VAT
CP3616	Vectra VL4	Pentium 120	850MB	8MB/128MB EDO	14"	£799	£938.83
CP3614	Vectra VL4	Pentium 133	1.2GB	16MB/128MB EDO	15"	£999	£1173.83
CP3615	Vectra VL4	Pentium 166	1.2GB	16MB/128MB EDO	15"	£1219	£1432.33
CP3617	Vectra XM4	Pentium 166	1.2GB	16MB/128MB EDO	15"	£1269	£1491.08

HP MONITORS			
Item	Model	Price	Inv VAT
EURMT0299	14" Colour	£225(264.38)	
EURMT0286	15" Colour	£325	£381.88



Panasonic CF-25

Vibration, Shock, water and dust resistant!

Panasonic CF-62 Features:

- ✓ 133MHz or 100MHz Pentium™ processor with Level-2 cache
- ✓ 16MB RAM 1.35GB hard drive
- ✓ 650MB rewritable optical drive
- ✓ 12.1" XGA (1024 x 768) or SVGA (800 x 600) TFT active matrix colour LCD
- ✓ 16-bit FM sound, integrated stereo speakers
- ✓ PC Card slots with ZV Port for optimum video and multimedia
- ✓ Lithium Ion Battery
- ✓ Magnesium alloy LCD case
- ✓ GlidePoint® pointing device
- ✓ New LC status panel with mini-icon display
- ✓ Optional MPEG full-screen, full-motion video playback
- ✓ Infrared Communication Port
- ✓ Full 32-bit PCI bus architecture
- ✓ 4X CD-ROM drive

The World's First Notebook PC with Integrated PD!

ITEM#	MODEL	PROCESSOR	HDD	RAM/Max	SCREEN	PRICE	INC. VAT
CP3601	CF-62	P/100	1.35GB	16MB/80MB	12.1" SVGA TFT	£2739	£3218.33
CP3600	CF-62	P/133	1.35GB	16MB/80MB	12.1" XGA TFT	£3249	£3817.58
CP4049	CF-61	P/120	1.35GB	16Mb/80Mb	12.1" SVGA TFT	£2655	£3119.63
CP4048	CF-61	P/150	2GB	16Mb/80Mb	12.1" XGA TFT	£3419	£4017.33
MY6249	8MB EDO Memory Upgrade for CF-62					£189	£222.08
MY6247	16MB EDO Memory Upgrade for CF-62					£335	£393.63
MY6245	32MB EDO Memory Upgrade for CF-62					£399	£468.83
MY6244	64MB EDO Memory Upgrade for CF-62					£2149	£2525.08
EX7308	CF-62 FMV MPEG Pack					£305	£358.38
AC20423	CF-62 Docking Station					£489	£574.58

Panasonic CF-25 Features:

- ✓ Intel Pentium 100MHz or 133MHz processor
- ✓ 8MB EDO RAM (expandable to 72MB)
- ✓ 840MB or 1.35GB hard disk drive
- ✓ 10.4" SVGA TFT colour display
- ✓ Windows 95
- ✓ Optional 6x CD-ROM
- ✓ 16-bit Soundblaster Pro compatible sound and speaker

The Panasonic C-25 offers unbeatable protection—a hard drive mounted in a shock-absorbing gel, magnesium alloy casing and internal dampers. Plus, it features rubber seals on all ports and a water-resistant coating, so it can stand up to even the most demanding mobile users!



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£2429**
Including VAT (£2854.08)

ITEM#	MODEL	PROCESSOR	HDD	RAM/Max	SCREEN	PRICE	INC. VAT
CP3627	CF-25	P/100	840MB	8MB/72MB	10.4" SVGA TFT	£1979	(£2325.33)
CP3626	CF-25	P/133	1.35GB	8MB/72MB	10.4" SVGA TFT	£2239	(£2630.83)
DR5654	6X CD-ROM Drive					£229	(£269.08)
MY6469	8MB EDO Memory Upgrade					£189	(£222.08)
MY6470	16MB EDO Memory Upgrade					£335	(£393.63)
EX7375	ZV MPEG Card					£219	(£257.32)
AC20619	Port Replicator					£195	(£229.13)
AC20620	Double Carry Case					£38	(£44.65)

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- ✓ 1Gb or 1.6Gb Hard Drive
- ✓ PCI local bus graphics

Deskpro 2000 Series

Model No	CPU	HDD	CD-ROM	RAM/Max	Price	Inc. VAT
5133	CP3350	133MHz	1GB	16/128MB	£756	(£888.30)
5133	CP3349	133MHz	1.6GB	16/128MB	£845	(£992.88)
5166	CP3419	166MHz	1.6GB	16/128MB	£979	(£1150.33)
6180	CP3347	180MHz	1GB 8xCD-ROM	16/128MB	£1355	(£1592.13)
6200	CP3346	200MHz	1.6GB 8xCD-ROM	16/128MB	£1625	(£1909.38)

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Deskpro 4000 Series The intelligent networking choice

Deskpro 4000 Series

Model No	CPU	HDD	CD-ROM	RAM/Max	Price	Inc. VAT
5120	CP3342	120MHz	1Gb	16/256MB	£865	(£1016.38)
5133	CP3340	133MHz	1.6Gb	16/256MB	£1095	(£1286.63)
5166	CP3418	166MHz	1.6Gb	16/256MB	£1249	(£1467.58)
5166	CP3417	166MHz	2.5Gb	16/256MB	£1415	(£1162.63)
6180	CP3337	180MHz	1.6Gb 8xCD-ROM	32/256MB	£1719	(£2019.83)
6200	CP3420	200MHz	2.5Gb 8xCD-ROM	32/256MB	£2039	(£2395.83)

Features:

- ✓ Choice of Intel Pentium or Pentium Pro Processors (120MHz up to 200MHz)
- ✓ 16Mb or 32Mb RAM (Expandable to 256Mb)
- ✓ 256Kb Level 2 cache
- ✓ 8 x CD-ROM (on selected models)
- ✓ 1Gb, 1.6Gb or 2.5Gb Hard Drive
- ✓ PCI local bus graphics
- ✓ Integrated NetFlex-3 10Base-T Ethernet controller
- ✓ Infrared data port



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Features:

- ✓ Choice of Intel Pentium or Pentium Pro Processors (166MHz up to 200MHz)
- ✓ 16Mb or 32Mb RAM (Expandable to 256Mb)
- ✓ 256 or 512Kb Level 2 cache
- ✓ 8 x CD-ROM
- ✓ 1Gb, 2.1Gb or 4.2Gb Hard Drive
- ✓ Matrox MGA Millennium PCI local bus graphics
- ✓ Integrated NetFlex-3 10Base-T Ethernet controller
- ✓ Infrared data port

Deskpro 6000 Series

Model No	CPU	HDD	CD-ROM	RAM/Max	Price	Inc. VAT
5166	CP3334	166MHz	1Gb 8xCD-ROM	16Mb/256Mb	£1709	(£2008.08)
5166	CP3333	166MHz	2.1Gb 8xCD-ROM	32Mb/256Mb	£2215	(£2602.63)
5200	CP3424	200MHz	1Gb 8xCD-ROM	32Mb/256Mb	£1945	(£2285.38)
5200	CP3423	200MHz	2.1Gb 8xCD-ROM	32Mb/256Mb	£2335	(£2743.63)
6180	CP3330	180MHz	2.1Gb 8xCD-ROM	32Mb/256Mb	£2195	(£2579.13)
6200	CP3421	200MHz	2.1Gb 8xCD-ROM	32Mb/256Mb	£2359	(£2771.83)
6200	CP3422	200MHz	4.2Gb 8xCD-ROM	32Mb/256Mb	£3119	(£3664.83)

Monitor not included

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Deskpro Upgrades and Accessories

Description	Price	Inc. VAT
MY6091 8Mb Memory Upgrade Module	£65	(£76.38)
MY6132 16Mb Memory Upgrade Module	£125	(£146.88)
MY6133 32Mb Memory Upgrade Module	£235	(£276.13)
MY6178 256Kb Secondary Cache (for Deskpro 2000)	£35	(£41.13)
MT1241 V50 15" Colour Monitor (Asset Management)	£225	(£264.38)
MT1261 V70 Colour Monitor (MPRII) (Asset Management)	£450	(£528.75)
MT1262 V70 Colour Monitor (TCO '95) (Asset Management)	£470	(£552.25)

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Battery-rich notebook. This no-compromise notebook has an integrated diskette drive and a battery in the Carrying Handle, which also provides a comfortable 10 degree tilt or neatly protects the ports. Whenever you need, swap the modular diskette drive for an extra battery, and walk away with up to 7 hours of continuous battery life.

Light, slimline notebook.

Want to carry as little as possible? Simply detach the Carrying Handle and the Armada 4100 now weighs just over 2.3 kg (5 lb). A diskette bay battery provides up to 3.5 hours battery life, and you can attach the diskette drive externally if you wish. You'll hardly notice this powerful, slimline notebook in your briefcase.

* 3 year parts and labour warranty

Compaq Armada 1100 Family - Affordability

Item	CPU	HDD	RAM/Max	Display	Price each	Inc VAT
CP3316	Armada 1120 5\100	810Mb	8\24	10.4"STN	£1019	(£1197.33)
CP4059	Armada 1130 5\120	1080Mb	16\48	10.4"STN	£1189	(£1397.08)
CP4060	Armada 1130T 5\100	1080Mb	16\48	10.4"TFT	£1445	(£1697.88)
MY6160	8Mb Memory Module				£99	(£116.33)
MY6161	16Mb Memory Module				£195	(£229.13)

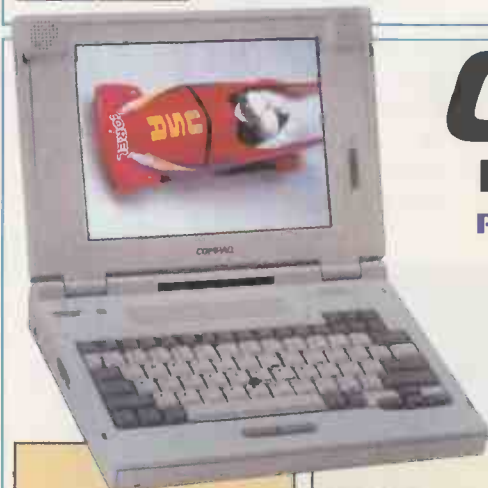
ARMADA 1120
£1019
including VAT (£1197.33)



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£1399
including VAT (£1643.83)

Compaq Armada 4100 Family - Mobility

Item	CPU	HDD	RAM/Max	Display	Price	Inc. VAT
CP3458	Armada 4110 5\100	810MB	8\40MB	11.3"STN	£1399	(£1643.83)
CP3457	Armada 4120 5\120	1GB	16\48MB	11.3"STN	£1909	(£2243.08)
CP3317	Armada 4130T 5\133	1GB	16\48MB	11.8"TFT	£2889	(£3394.58)
MY6155	8MB Memory Module				£109	(£128.08)
MY6156	16MB Memory Module				£239	(£280.83)
AC20203	Auto Adapter				£55	(£64.63)



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Power and Flexibility without equal

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Compaq LTE 5000 Series

Description	Item	Processor	HDD	RAM/Max	Screen	Price	Inc. VAT
LTE 5150	CP3544	5\100	810Mb	8Mb/72Mb	11.3" Col STN	£1659	(£1949.33)
LTE 5280	EURCP3272	5\120	1.3Gb	16Mb/80Mb	11.3" Col TFT	£2549	(£2995.08)
LTE 5300	CP3915	5\133	2.1Gb	16Mb/80Mb	12.1" Col TFT	£3055	(£3589.63)
LTE 5380	CP3914	5\133	2.1Gb	16Mb/80Mb	12.1" Col TFT	£3225	(£3789.38)
Accessories							
8Mb Memory Upgrade Module	EURMY1343					£110	(£129.25)
16Mb Memory Upgrade Module	EURMY1467					£229	(£269.08)
32Mb Memory Upgrade Module	MY6151					£329	(£386.58)
MultiBay Expansion Base	EX6694					£325	(£381.88)
6 x CD-ROM Drive	DR5376					£275	(£323.13)
3.5" Floppy Disk Drive	DR5487					£59	(£69.33)

- ✓ Power and performance with a combination of Intel Pentium processors and PCI-based local bus graphics
- ✓ User customisation - tailor features and functionality to the optimum
- ✓ Modular design - MultiBay options include, CD-ROM drive, hard drive, disk drive or extra battery



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Satellite 110cs



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Item	Model	CPU	RAM/MAX	HDD (MB)	Screen	Price Inc VAT
EURCP3581	Sat 110CS	5/100	8MB/40MB	810	11.3" DSTN	£929 £1091.58
EURCP3580	Sat 110CT	5/100	8MB/40MB	810	11.3" TFT	£1355 £1592.13
CP3893	Sat 2000CDS New	5/100	8MB/40MB	1350	11.3" DSTN	£1185 £1392.38
CP3899	Sat 2000CDT New	5/100	8MB/40MB	1350	11.3" TFT	£1779 £2090.33
CP3898	Sat Pro 430CDS New	5/120	16MB/48MB	1350	11.3" DSTN	£1695 £1991.63
CP3897	SAT PRO 430CDT NEW	5/120	16MB/48MB	1350	11.3" TFT	£2129 £2501.58
EURUP1670	8MB Memory Upgrade Module for Satellite Series					£225 £264.38
EURMY1671	16MB Memory Upgrade Module for Satellite Series					£425 £499.38

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- Manufacturers Limited 3 Year Warranty



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Item	Model	CPU	RAM/MAX	HDD (MB)	Screen	Price	Inc VAT
EURCP3577	Tecra 500CS	5/120	16MB/144MB	1350	12.1" DSTN	£1695	£1991.63
EURCP3332	Tecra 500CDT	5/120	16MB/144MB	1350	12.1" TFT	£2205	£2590.88
CP3896	Tecra 510CS New	5/133	16MB/144MB	1350	12.1" DSTN	£2289	£2689.58
CP3895	Tecra 500CDT New	5/133	16MB/144MB	1350	12.1" TFT	£2799	£3288.83
CP3687	Tecra 730CDT	5/150	16MB/144MB	2168	12.1" TFT	£3565	£4188.88
CP4118	Tecra 730XCDT	5/150MMX	16MB/144MBEDO	2100	12.1" Col TFT	£3735	£4388.63
CP4120	Tecra 740CDT	5/166MMX	16MB/144MBEDO	2100	13.3" Col TFT	£4245	£4987.88
EURCP3576	Portege 650CT	5/133	16MB/80MB	1350	11.3" TFT	£2545	£2990.38
CP3894	Portege 660CDT New	5/150	16MB/80MB	1440	11.3" TFT	£3395	£3989.13
MY6234	8MB Memory Upgrade Module for Tecra 500					£225	£264.38
MY6255	16MB Memory Upgrade Module for Tecra 500					£425	£499.38
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EURMY1221	1MB X 9-70NS 9 CHIP	1MB	£14.95	(£17.57)
EURMY1222	1MB X 9-70NS 3 CHIP	1MB	£11.95	(£14.04)
EURMY0405	4MB X 9-70NS (9 CHIP)	4MB	£39.95	(£46.94)
EURMY1230	4MB X 9-70NS (3 CHIP)	4MB	£39.95	(£46.94)
72 PIN PARITY SIMMS				
EURMY0416	1MB X 36-60NS	4MB	£32.95	(£38.72)
EURMY1235	1MB X 36-70NS	4MB	£29.95	(£35.19)
EURMY1561	2MB X 36-60NS	8MB	£59.95	(£70.44)
EURMY1237	2MB X 36-70NS	8MB	£54.95	(£64.57)
EURMY1238	4MB X 36-60NS	16MB	£94.95	(£111.57)
EURMY1239	4MB X 36-70NS	16MB	£89.95	(£105.69)
EURMY1241	8MB X 36-70NS	32MB	£195.00	(£229.13)
72 PIN NON PARITY SIMMS				
EURMY1244	1MB X 32-60NS	4MB	£16.95	(£19.92)
EURMY1245	1MB X 32-80NS	4MB	£15.95	(£18.74)
EURMY1250	2MB X 32-60NS	8MB	£31.95	(£37.54)
EURMY1249	2MB X 32-70NS	8MB	£29.95	(£35.19)
EURMY1253	4MB X 32-60NS	16MB	£69.95	(£82.19)
EURMY1252	4MB X 32-70NS	16MB	£65.95	(£77.49)
EURMY1293	8MB X 32-60NS	32MB	£145.00	(£170.38)
EURMY1254	8MB X 32-70NS	32MB	£139.00	(£163.33)
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EURMY1336	1MB X 32-60NS EDO	4MB	£15.95	(£18.74)
EURMY1332	2MB X 32-60NS EDO	8MB	£29.95	(£35.19)
EURMY1555	4MBx32-60NS EDO	16MB	£65.95	(£77.49)
EURMY1643	8MBx32-60NS EDO	32MB	£145.00	(£170.38)



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Windows 95 presents a major step forward in functionality on desktop and portable PCs. This new operating system is easier, faster, and more powerful to use, but it performs best with 16MB of memory!

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Next to buying a new PC, installing additional (or larger) memory (SIMMS) in your machine is the single best investment you can make. From the first time you run with more RAM, you'll be able to ...

- ✓ Open and use MORE applications at the same time!
- ✓ Use MORE of your application's advanced features!
- ✓ Get MORE speed and performance!
- ✓ Find MORE ways to get jobs done faster and better!



Get your system Ready for Windows 95! Most of these branded machines may use standard memory, a cost-effective alternative to proprietary memory. Please check your manual to find out which memory you require or call Inmac for assistance!

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Expand Your Computer's Memory Beyond What It Normally Can Offer

The MY5616, 17 expands a single 72 pin socket into two 72 pin sockets. Great for memory expansion when all motherboard SIMM slots are already used. Also allows lower density, and often cheaper, SIMMS to be used in PC motherboards with just a few SIMM slots. Maps one or two 256KB, 1, 4, or 16MB x 36 SIMMS into one 72 pin slot.



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MY5616	Pin 1 on left (front)	£65.00	(£76.38)
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MY5682	Adapt (4) 30 pin to (1) 30 pin(F)	£35.00	(£41.13)
MY5683	Adapt (4) 30 pin to (1) 30 pin(B)	£35.00	(£41.13)

Use Old Memory Chips in Your New Computer

The MY5612, 13 adapts four 30 pin SIMMS into one 72 pin SIMM socket. Ideal for the user who wants to upgrade and reuse 30 pin SIMMS. Four 256KB, 1, 4, or 16MB x 9 30 pin SIMMS map into one 1, 4, 16, or 64MB x 72 pin equivalent respectively.



As Low As **£45**

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MY5614	Adapt (8) 30 pin to (1) 72 pin(B)	£65.00	(£76.38)
MY5615	Adapt (8) 30 pin to (1) 72 pin(F)	£65.00	(£76.38)
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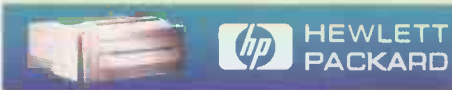
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LASERJET 5L 1MB EURMY1328 £29.95 £35.19
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4MB EURMY0723 £115.00 £135.13

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4MB EURMY0731 £149.00 £175.08

HL10-H 1MB EURMY0732 £29.00 £34.08
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OL800,OL820 1MB EURMY1072 £69.00 £81
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16MB EURMY1571 £149.00 £175.08
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THINKPAD 760E,760ED,760EL, 760ELD,760EX 8MB MY6360 £89.95 £105.69
16MB MY6361 £159.00 £186.83
THINKPAD 365X,XD,560,535, 32MB MY6363 £349.00 £410.08

THINKPAD 700,700C,720,720C 2MB CALL £CALL £93.94
750,750C,750Ce,750Cs,750P/ 4MB EURMY1017 £79.95 £117.44
755, PS/2 CL575X,370 8MB EURMY1018 £99.95 £198.68
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THINKPAD 330/340/355/ 360 Series, 370C 4MB EURMY1019 £69.95 £82.19
8MB EURMY1020 £89.95 £105.69
16MB EURMY1021 £159.00 £186.83
16MB is not for 340

THINKPAD 500 4MB EURMY1573 £119.00 £139.83
8MB EURMY1574 £229.00 £269.08

THINKPAD 510CS 4MB EURMY1573 £119.00 £139.83
8MB EURMY1574 £229.00 £269.08
16MB EURMY1575 £CALL £

THINKPAD 530 4MB EURMY1576 £119.00 £139.83
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CONTURA 4/25,C,CX,EX 4MB EURMY0821 £59.95 £70.44
8MB EURMY0822 £89.95 £105.69
16MB EURMY0823 £175.00 £205.63

CONTURA AERO 4/33C - 4/25 8MB EURMY0831 £99.95 £117.44
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CONCERTO 4/33-4/25 - LTE ELITE 4/40C,CX,4/50CX, 4/50E,4/75C,CX,CXL 4MB EURMY0824 £59.95 £70.44
8MB EURMY0825 £99.95 £117.44
16MB EURMY0826 £169.00 £198.58

CONTURA 3/20,3/25,3/25C 2MB EURMY0818 £75.00 £88.13
4MB EURMY0819 £69.95 £82.19
8MB EURMY0820 £79.95 £93.94

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16MB MY6367 £149.00 £175.08

ARMADA 4100/4110,4110D/ 4120, 4120T/4125D/4130T 8MB MY6368 £109.00 £128.08
16MB MY6369 £199.00 £233.83
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16MB EURMY0804 £99.95 £117.44

LTE 5000,5100,5200,5300, 5280, 5380,5150,5250 8MB EURMY1491 £109.00 £128.08
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410/415/420CDS,420CDT/430CDS, 430CDT/PORTEGE 610C/620CT	32MB EURMY1462 £289.00 £339.58	

PORTEGE 650	8MB MY6229 £129.00 £151.58	16MBMY6136 £235.00 £276.13
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LIBERTTO 20	8MB MY6377 £129.00 £151.58	12MBMY6379 £199.00 £233.83
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T2000/SX/SXE,T2200SX, T1800, T1850,T1850C, T1000LE	2MB EURMY1142 £69.95 £82.19	4MB EURMY1146 £99.95 £117.44	8MB EURMY1176 £119.00 £139.83
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T2100 SERIES	4MB EURMY1172 £69.95 £82.19	8MB EURMY1173 £89.95 £105.69	16MB EURMY1304 £149.00 £175.08	24MB EURMY1620 £259.00 £304.33
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T3200SXC	2MB EURMY1174 £75.00 £88.13	4MB EURMY1158 £139.00 £163.33
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T3300SL	2MB EURMY1145 £85.00 £99.88	4MB EURMY1151 £159.00 £186.83	6MB EURMY1179 £249.00 £292.58
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T2400/T2450/T3600	4MB EURMY1165 £59.95 £70.44	8MB EURMY1167 £89.95 £105.69	16MB EURMY1170 £129.00 £151.58
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T3400	4MB EURMY1165 £59.95 £70.44	8MB EURMY1167 £89.95 £105.69	16MB EURMY1169 £99.95 £117.44
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T4400C/SX/SXC,T6400 T6600 SERIES	2MB EURMY1144 £59.95 £70.44	4MB EURMY1149 £69.95 £82.19	8MB EURMY1177 £99.95 £117.44	16MB EURMY1159 £169.00 £198.58
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T1900/C,1910,1950, 1960 SERIEST4500,T4600, T4700,4800,4850,4900 SERIES, DYNAPAD T200	4MB EURMY1161 £69.95 £82.19	8MB EURMY1163 £99.95 £117.44	16MB EURMY1164 £149.00 £175.08
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T5100	2MB EURMY1147 £99.00 £116.33
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T5200/T5200C/T8500	2MB EURMY1154 £129.00 £151.58
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LATITUDE 433M,433MC, 450MC, 475MC,450MCX, LX 4100D, 4100T,475D	4MB EURMY0866 £49.95 £58.69	8MB EURMY0867 £99.95 £117.44	16MB EURMY1605 £159.00 £186.83
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LATITUDE XP 450C,450CX, 475C, 4100CX/XPI	4MB EURMY0869 £149.00 £175.08	8MB EURMY1564 £79.00 £92.83	16MB EURMY0868 £129.00 £151.58
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LATITUDE LM P100SD	8MB MY6457 £99.95 £117.44	16MBMY6458 £179.00 £210.33	32MBMY6461 £299.00 £351.33
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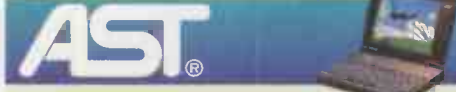
OMNI BOOK 300,425,430	2MB CALL £CALL £	4MB EURMY1619 £CALL £
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OMNI BOOK 530,600C	4MB EURMY1318 £69.95 £82.19	8MB EURMY1319 £99.95 £117.44	12MBXXXXXXXXXX N/A
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OMNI BOOK 4000 SERIES	4MB EURMY1625 £109.00 £128.08	8MB EURMY1627 £199.00 £233.83	16MB EURMY1626 £379.00 £445.33
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OMNI BOOK 5500	8MB NEW £CALL £	16MB NEW £CALL £	32MB NEW £CALL £
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OMNI BOOK 800	8MB NEW £CALL £	16MB NEW F1168A £CALL £	32MB NEW F1169A £CALL £
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ASCENTIA 800N,810N	4MB EURMY1333 £69.95 £82.19	8MB EURMY1334 £99.95 £117.44	16MB EURMY1339 £169.00 £198.58
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ASCENTIA 900N,910N	4MB EURMY1501 £65.95 £77.49	8MB EURMY1502 £99.95 £117.44	16MB EURMY1503 £175.00 £205.63
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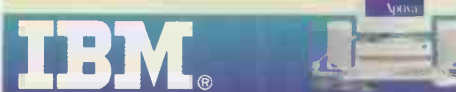
ASCENTIA 950N	8MB EURMY1631 £119.00 £139.83	16MB EURMY1630 £175.00 £205.63
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ASCENTIA P SERIES	8MB EURMY1674 £109.00 £128.08	16MB EURMY1675 £159.00 £186.83	32MB EURMY1672 £439.00 £515.83
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ASCENTIA J SERIES	8MB EURMY1677 £89.95 £105.69	16MB EURMY1676 £179.00 £210.33	32MB EURMY1673 £299.00 £351.33
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ASCENTIA A SERIES	8MB NEW £CALL £	16MB NEW £CALL £
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DESKTOP



PC-300 486 Series 6573-XXX, 6583-XXX, 6571-XXX, 6581-XXX, PC-300 Pentium Series 6575-XXX, 6585-XXX (NOTE FOR PENTIUM MUST BE IN PAIRS)	4MB EURMY1587 £34.95 £41.07	8MB EURMY1588 £99.95 £117.44	16MB EURMY1589 £139.00 £163.33	32MB EURMY1590 £239.00 £280.83
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PC 500 Series	4MB EURMY0994 £159.00 £186.83	8MB EURMY1581 £219.00 £257.33	16MB EURMY1582 £569.00 £668.58	32MB EURMY1593 £1269.00 £1491.08
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PC 700 Series 6875-XXX, 6885-XXX, 6876-XXX, 6886-XXX, Power 830,850 SERIES (NOTE FOR PENTIUM MUST BE IN PAIRS)	4MB EURMY1028 £69.00 £81.08	8MB EURMY0981 £89.95 £105.69	16MB EURMY1025 £139.00 £163.33	32MB EURMY1594 £419.00 £492.33
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PS/VP 6381-FY1/FYE/KYO/ MYO/MY1/YO,433DX/SI	4MB EURMY1028 £69.00 £81.08	16MB EURMY1025 £139.00 £163.33
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PS/VP 6382-C20/C21/C41/ C2A/C4A/F3C/K3C/M5C/W5C/ MSD/W5D (C/K/F/W)	4MB EURMY0974 £69.95 £82.19	8MB EURMY0981 £89.95 £105.69	16MB EURMY1025 £139.00 £163.33
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PS/VP 6384 F/M/W SERIES (EXCEPT F00/F20/F23/F40/ F43/M00/M20/M40/M43/ M50/M53/W40/W53)	4MB EURMY0974 £69.95 £82.19	8MB EURMY0981 £89.95 £105.69	16MB EURMY1025 £139.00 £163.33
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PS/VP 6384 F00/F20/F23/F40/ F43/M00/M20/M40/M43/ M50/M53/W40/W53	4MB EURMY0965 £79.95 £93.94	16MB EURMY0967 £169.00 £198.58
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PS/VP C00/C2A/C20/C4A/ C40	2MB EURMY1002 £39.95 £46.94	4MB EURMY0957 £69.95 £82.19	8MB EURMY1009 £89.95 £105.69
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PS/1 2133-C43/W43/S43/ 174/154,2155-C44/W44/S44, PS/1 2155-G76/W76/S76	4MB EURMY0965 £79.95 £93.94	16MB EURMY0967 £169.00 £198.58
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PS/1 2133-G11/G13/W11/ W13/811/S11/S13/111/451/ 461/471/483/551,2168-452/ 473/493/573,2155-G14/W14/ S14	1MB EURMY0970 £29.95 £35.19	2MB EURMY1002 £39.95 £46.94	4MB EURMY0974 £69.95 £82.19	8MB EURMY0981 £89.95 £105.69
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PS/1 2133-571/642/652, PS/1 2168-574/S84/S94/653/ 873, PS/1 2155-582/S92/S93	4MB EURMY0996 £35.95 £42.24	8MB EURMY0997 £74.95 £88.07	16MB EURMY1239 £89.95 £105.69
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DP 286/386N, 386S/20,20N, SP/LT,M & i SERIES/ PROSIGNIA PC SERIES, 486/256Exp. Board	4MB EURMY0772 £69.00 £81.08	8MB EURMY0812 £119.00 £139.83	0MB EURMY0834 £55.00 £64.63
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DP 3/25i, 3/33i, 4/25iS, 4/33i,4/66i	4MB EURMY0772 £69.00 £81.08	8MB EURMY0812 £119.00 £139.83
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DP 386/33L,486/25/33L/50L, SYSTEM PRO 486/E SERIES	8MB EURMY0811 £285.00 £334.88	32MB EURMY08171 £1175.00 £1380.63
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DESKPRO M & SP/LT SERIES exp. Board (NOT LT486/33)	0MB EURMY0835 £99.00 £116.33	2MB EURMY0836 £174.00 £204.45	4MB EURMY0837 £224.00 £263.20	8MB EURMY0838 £195.00 £229.13
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DESKPRO XE 433S,450,466	4MB EURMY0772 £69.00 £81.08	8MB EURMY0812 £119.00 £139.83
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DESKPRO XE 560,5/66M,S/ 60M	16MB EURMY1596 £216.00 £253.80	32MB EURMY1597 £396.00 £465.30	64MB EURMY1598 £656.00 £770.80
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DESKPRO 2000 - 4000 - 6000 SERIESD/P S166-S150- S133-S120-S100-S75 SERIES	8MB NEW £CALL £	16MB NEW £CALL £	32MB NEW £CALL £	64MB NEW £CALL £
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D/P XL 450,466 D/P 5100, 8MB EURMY0832 £138.00 £162.15
5120,575,590PROSIGNIA 300 16MBEURMY1599 £139.00 £163.33
5/120 - 500 5/90,5/120,5150 32MBEURMY1600 £249.00 £292.58

DESKPRO XL6100 SERIES, 16MBMY6372 £199.00 £233.83
XL6150,6200 PENTIUM PRO !! 32MBMY6373 £399.00 £468.83
64MBMY6374 £659.00 £774.33

NEW PROLINEA 4/50,4/66, 4MB EURMY0827 £59.95 £70.44
4/100 (575,590,5100 MUST BE 8MB EURMY0828 £44.95 £52.82
IN MACHED PAIRS) NEW DP 16MBEURMY0829 £159.00 £186.83
4/66,4/100

PROLINEA 3/25S,325ZS 2MB EURMY0800 £34.95 £41.07
8MB EURMY0801 £89.95 £105.69

PROLINEA 4/25S,4/33,4/50, 1MB EURMY0784 £29.95 £35.19
4/66,CDS,PRESARIO 2MB EURMY0786 £39.95 £46.94

PROLIANT 1000 486DX2-66 4MB EURMY0790 £59.95 £70.44
8MB EURMY0795 £99.95 £117.44
16MBEURMY0805 £119.00 £139.83

PROLINEA MT 4/33S,MT 4/50, 1MB EURMY0784 £29.95 £35.19
MT466, PROLINEA ENHANCED 2MB EURMY0786 £39.95 £46.94
4/100,4/33S,4/50,4/50S,4/66 4MB EURMY0790 £59.95 £70.44
8MB EURMY0795 £99.95 £117.44
16MBEURMY1601 £439.00 £515.83
32MBEURMY1602 £289.00 £339.58

PROLINEA NET 1-25S/E/TR 2MB EURMY0786 £39.95 £46.94
4MB EURMY0790 £59.95 £70.44
8MB EURMY0795 £99.95 £117.44

PROSIGNIA PC SERVERS 4MB EURMY0772 £69.00 £81.08
8MB EURMY0812 £119.00 £139.83
16MBEURMY0805 £119.00 £139.83
32MBEURMY1602 £289.00 £339.58

PRESARIO 720CDS,724CDS, 4MB EURMY1603 £34.95 £41.07
744-744CDS,920CDS, 924- 8MB EURMY1604 £59.95 £70.44
954-972 CDS, 978CDTV, 16MB EURMY1606 £119.00 £139.83
982CDS,992CDS/9564,9548, 32MBEURMY1607 £229.00 £269.08
9546,510-520-524-526CDS, 520-528CDTV, 7180 - 7170 -
7152 - 7110
(PENTIUM TO BE IN PAIRS)

PRESARIO CDS 633,CDS 860, 4MB EURMY0790 £59.95 £70.44
660 8MB EURMY0795 £99.95 £117.44
16MBEURMY0805 £119.00 £139.83

PROLIANT 2000 - 4000 - 4500 16MB EURMY1596 £216.00 £253.80
SERIES, SYSTEMPRO/XL 486/ 32MBEURMY1597 £396.00 £465.30
50,PENTIUM 64MBEURMY1598 £656.00 £770.80
128MBEURMY1608 £899.00 £1056.33

PRESARIO 7180,5526,5528, 4MB EURMY0827 £59.95 £70.44
5536,9564,9548,9536, 8MB EURMY0828 £44.95 £52.82
16MBEURMY0829 £15.00 £17.63
32MBEURMY1609 £419.00 £492.33

PROLIANT 1500, 1500R 8MB BN3920 £69.95 £82.19
PROSIGNIA 300 5/150 16MBBN3921 £99.95 £117.44
32MBBN3922 £389.00 £457.08
64MBBN3923 £199.00 £233.83

DIMENSION XPS P100,P100C, 8MB EURMY1613 £49.95 £58.69
P120C,P133C, DIMENSION 16MBEURMY1614 £79.95 £93.94
P60,P75,P90, OPTIPLEX XL,XM,32MBEURMY1615 £149.00 £175.08
XMT590,5100,5120,575



"DIMENSION P166S, P200S" 8MB MY6462 £59.95 £70.44
16MBMY6454 £119.00 £139.83
32MBMY6463 £229.00 £269.08

OMNIPLEX 560ME,566ME, 8MB EURMY0863 £69.95 £82.19
590ME, POWEREDGE XES90, 16MBEURMY0864 £119.00 £139.83
5100,560,566,590 32MBEURMY0865 £119.00 £139.83

OPTIPLEX GXL, GXM,GXMT 8MB MY6464 £39.95 £46.94
Pentium Family, OPTIPLEX GL, 16MBMY6465 £99.95 £117.44
GM, GMT Pentium Family 32MBMY6466 £CALL £

JX PRO 200 16MBNEW £CALL £
32MBMY6706 £229.00 £269.08
64MBNEW £CALL £

486P/66/50/33/25/20/16, 1MB EURMY0847 £ £
486D/66/50/33/25/20D/16 4MB EURMY0849 £44.95 £52.82
16MBEURMY0852 £99.95 £117.44

PERFORMANCE ME SERIES 4MB EURMY0862 £29.95 £35.19
8MB EURMY0863 £69.95 £82.19
16MBEURMY0864 £119.00 £139.83
32MBEURMY0865 £199.00 £233.83

PERFORMANCE T-L-M SERIES, 4MB EURMY0860 £24.95 £29.32
466i,433/Si,425Si,450Si,433E 16MBEURMY0861 £74.95 £88.07

POWERLINE 466/450/433/ 4M EURMY0844 £79.95 £93.94
425/420 TE/DE, DE/2/SE, 8MB EURMY0845 £69.95 £82.19
466SE/DSA 16MBEURMY0846 £119.00 £139.83
32MBEURMY0853 £199.00 £233.83



VECTRA 486S-20 PC/25T/33T 4MB EURMY0899 £49.95 £58.69
8MB EURMY0902 £79.95 £93.94
512K EURMY0919 £41.00 £48.18

VECTRA 486 VL 4MB EURMY0899 £49.95 £58.69
8MB EURMY0902 £79.95 £93.94

VECTRA VL2,VL3 (NOT PENTIUM) 4MB EURMY0916 £29.95 £35.19
(FOR PENTIUM INSTALL IN PAIRS) 8MB EURMY0917 £49.95 £58.69
16MBEURMY0918 £99.95 £117.44

VECTRA VL4 5/90,5/100,5/ 8MB EURMY1624 £49.95 £58.69
120,5/133 MT 16MBEURMY1623 £99.95 £117.44
VECTRA 500 TOWER,VE 32MBEURMY1622 £169.00 £198.58
(PENTIUM MODELS EDO MEMORY)

VECTRA 486-25N/33N/50N/ 4MB EURMY0899 £49.95 £58.69
66N NETSERVER LE SERIES 8MB EURMY0902 £79.95 £93.94
(486XM SERIES 32BIT) 16MBEURMY0907 £119.00 £139.8
NETSERVER LC,LH (PENTIUM 4MB EURMY1621 £49.95 £58.69
SERIES INSTALL IN PAIRS) 8MB EURMY1617 £79.95 £93.94
16MBEURMY0918 £99.95 £117.44
32MBEURMY1618 £199.00 £233.83



BRAVO MS-T 5166,5133/MS 8MB EURMY1661 £89.95 £105.69
5100,5133/LC 5100,5133, 16MBEURMY1662 £119.00 £139.83
5166 32MBEURMY1663 £229.00 £269.08
64MBEURMY1664 £459.00 £539.33

BRAVO LC 4/25s,4/33,4/33s, 4MB EURMY0715 £39.95 £46.94
450s, BRAVO LP 4/33s,4/33, 8MB EURMY0716 £59.95 £70.44
4/30s,4/66ADVANTAGE! PRO 16MBEURMY0717 £69.95 £82.19
486DX/33,486SX/2 32MBEURMY1500 £229.00 £269.08



DX2/66, DX2/50 4MB EURMY1245 £15.95 £18.74
(Deluxe & Mini Computer) 8MB EURMY1249 £29.95 £35.19
16MBEURMY1252 £65.95 £77.49

P5-100XL,75,90,90XL 4MB EURMY1336 £15.95 £18.74
P5-120,133XL,150,166XL 8MB EURMY1332 £29.95 £35.19
Pentium Pro G6-150,G6-200 16MBEURMY1555 £65.95 £77.49
(FOR ALL PENTIUM TO BE 32MB EURMY1643 £145.00 £170.38
INSTALLED IN PAIRS)

All Memory Upgrades featured here are supplied by top memory manufacturers. The hardware manufacturer logos, including AST, Brother, Canon, Compaq, Dell, Epson, Hewlett-Packard, IBM, Kyocera, Okidata, Panasonic, Toshiba and Star are shown to help identify the proper Memory Upgrades compatible with your particular hardware system. All logos shown are registered trademarks of their respective holders.



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EURPA1261: HP LaserJet 5L Toner Cartridge£59.95 (£70.44)
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£145
(£170.30)

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"Personal Quality"

- ✓ Superb 600dpi plus HP Ret, 8ppm
- ✓ Dual paper bins and manual option
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- PR11827: HP LaserJet 6P£445 (£522.88)
INP0975: HP LaserJet 6MP (Mac/PC)£553 (£649.78)
PR11350 Toner: HP LaserJet 6P/6MP£59.95 (£70.44)

HP LaserJet 5 Printer



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- EURPR1666: HP LaserJet 5£815 (£1016.38)
EURPR1664: HP LaserJet 5N (PC,NW)£959 (£1128.83)
EURPR1665: HP LaserJet 5M (PC,MAC)£1109 (£1303.08)
PR7350 Toner: HP LaserJet 4+/4M+/5/5M£69.95 (£82.19)

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£105
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Printer•Fax•Copier•Scanner

- ✓ 600X3000 addressable-dpi inkjet printing with RET
- ✓ 335KB (24 page) fax memory
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- ✓ Includes OmniPage Limited Edition™ software from Caere

- PR11714 HP OfficeJet 350£465 (£546.38)

HP LaserJet 4V Printer

- #### "Ultimate A3 Printer"
- ✓ Paper handling from A5 to A3
 - ✓ Fast 8ppm A3, 16ppm A4
 - ✓ 120 lpi with 106 grey shades
 - ✓ PostScript and Network options

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£235
(£276.13)

- EURPR0433: HP LaserJet 4V (PC)£1389 (£1514.58)
EURPR0434: HP LaserJet 4MV (PC/Mac)£1859 (£2184.33)
EURPR0607 Toner: HP LaserJet 4V/4MV£109.95 (£129.19)

HP LaserJet 5SI Printer

- #### "High Volume Office Printer"
- ✓ Superb print quality, 24ppm
 - ✓ Very flexible- A3/A4 Capable
 - ✓ Outstanding reliability
 - ✓ Network, PostScript, Duplex options

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(£622.75)

- EURPR1490: HP LaserJet 5Si£1819 (£2137.33)
EURPR1489: HP LaserJet 5SIMX (PC, NW, MAC)£2479 (£2912.83)
EURPA1283: DUPLEX OPTION£375 (£440.63)
EURPA1285: 2000 SHEET FEEDER£735 (£863.63)
EURPA1278 Toner: HP LaserJet 5SI/5SIMX£139.95 (£164.44)

HP Colour LaserJet 5

- #### "Incredible Colour Laser Quality"
- ✓ 1200 dpi image quality through RET (300 dpi engine)
 - ✓ 10ppm mono, 2-3ppm colour
 - ✓ A3/A4 capable
 - ✓ 20MB memory; Enhanced PCL5
 - ✓ One year on-site warranty

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(£1145.63)

- EURPR1643: HP Colour LaserJet 5£4099 (£4886.83)
EURPR1642: HP Colour LaserJet 5M£5029 (£5909.08)
EURPR0660 Toner: Black£9.95 (£11.69)
Toner: Colour (specify C, M or Y)£26.95 (£31.67)

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Laser quality black 

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- ✓ HP Real Life Imaging System
- ✓ Sharpest Black Printing with HP pigmented inks
- ✓ 30 TrueType Fonts
- ✓ Up to 5ppm black, 2ppm colour
- ✓ Optional PhotoREt for better colours

With HP's optional Photo Colour Kit, colours are even more lifelike allowing 6 inks to be mixed giving you better pastels and skin tones. Images have a higher definition due to the increased resolution and in combination with ColorSmart, the printer now mixes a total of 6 inks to match the colour tone desired. For the best possible photo realistic prints, use HP's new Photo Paper.

- PR11895 HP Deskjet 693c with Disney Software
- EURPR1138 HP Cart Ink Col DJ600/660/690C
- EURPR1139 HP Cart Ink Blk DJ600/660/690C
- AC20411 HP Photo Colour Kit
- AC20412 HP Photo Paper

- £215 (£252.63)
- £22.95 (£26.97)
- £19.95 (£23.44)
- £42.00 (£49.35)
- £11.85 (£13.93)

HP DeskJet 820Cxi



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3 yr
OSM
only
£105
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State of the art printer

- ✓ Laser quality 600 dpi black
- ✓ Superb new colour inks
- ✓ 3 year return to Hewlett Packard Warranty
- ✓ 4ppm black, 1.5ppm colour

- PR11739 HP DeskJet 820Cxi Printer £214 (£251.48)
- 51645A Black pen £19.95 (£23.44)
- 51641A Colour pen £22.95 (£26.99)

HP DeskJet 870Cxi Printer



**ONLY
£299**
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OSM
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£105
(£123.39)

Premium Printing performance

- ✓ 600x600 dpi black, 300x300dpi colour
- ✓ Denser, Sharer inks
- ✓ Colour REt and ColourSmart Technology
- ✓ Laser quality black at 6ppm and high quality colour at 2ppm

- PR11738 HP DeskJet 870Cxi Printer £299 (£351.33)
- 51645A Black pen £19.95 (£23.44)
- 51641A Colour pen £22.95 (£26.99)

HP DeskJet 340 Printer





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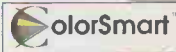
- ✓ Colour option, 30-sheet feeder, 2 ppm
- ✓ Highly portable — battery option
- ✓ 600 x 300 dpi black with HP RET

- EURPR1468: HP DeskJet 340 £139 (£163.33)
- EURPA1254: Colour Option Kit C3281A £31 (£36.43)
- EURAC2472: Infra-red Adapter £32 (£37.60)
- EURAC3005 Black Cartridge: HP DeskJet 320/340 £19.95 (£23.44)
- PR5650 Colour Cartridge: HP DeskJet 320/340 £22.95 (£26.97)

HP DeskJet 400c Printer



**ONLY
£119**
including VAT £139.83



3 yr
OSM
only
£105
(£123.39)

- ✓ Prints up to 3 pages per minute
- ✓ 600x300 dpi black text output with REt
- ✓ Includes HP Color Kit with up to 16,7 million brilliant colours
- ✓ Automatic 50 page sheet feeding

- PR11743 HP DeskJet 400c Printer£115 (£135.13)

HP DeskJet 1600c Printer

- ✓ Laser-like black and colour
- ✓ Fast black 8 ppm and colour
- ✓ Expandable paper handling, 4 MB
- ✓ Network connectivity options



- EURPR1011: HP DeskJet 1600C £815 (£957.63)
- EURPR1021: HP DeskJet 1600CM (NW/MAC) £1209 (£1420.58)

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FS-3700

- ✓ 18ppm High quality Laser printer
- ✓ 2MB enhanced to 4MB
- ✓ Single 250 page cassette and 100 sheet multi purpose tray (via manual feed)
- ✓ 45 Scaleable fonts
- ✓ 12 month RTB

600X600 RESOLUTION

PR1201

FS-3700 shown with optional accessories

ONLY £1199
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FS-1700

- ✓ 12 ppm High Quality Laser Printer
- ✓ 33Mhz processor
- ✓ Electrophotographic printing method
- ✓ Kyocera Image refinement (1200dpi quality)
- ✓ IEEE 1284 compliant high speed bi-directional parallel
- ✓ Single 250 page cassette and 100 sheet multipurpose tray (via manual feed)
- ✓ 12 months RTB

ONLY £899

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600X600 RESOLUTION



PR1202

Ecosys Printers have a permanent drum so the only consumable you need is toner. This makes them remarkably cheap to run and reduces environmental impact.

KX-P6300

- Offering the best in quality laser printing Panasonic's PX-6300 provides 600x600dpi at 6 pages per minute. Features include WYSIWYG printing HP LaserJet™ IIP emulation for DOS applications running through Windows and a Microsoft® Windows 3.1 printer driver. Plus, silent standby gives you whisper quiet operation.
- ✓ 600 x 600dpi
 - ✓ Prints at 6 pages per minute
 - ✓ Edge smoothing print function with EET™ (Edge enhancement technology)
 - ✓ Photo enhancement: Enhance print quality of a photo image
 - ✓ Optimized for fast printing and return to applications in all Windows

EURPR1689 **KX-P6300** €225 (£264.38)
EURPR1297 **KX-P6100** €189 (£222.08)

ONLY £225
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KX-P6500

- ✓ 6 pages per minute
- ✓ Bi directional Parallel interface
- ✓ Ideal for a network environment
- ✓ High Quality Print Finish with EET
- ✓ Photo Enhancement
- ✓ Power and Toner Save Mode
- ✓ High-speed printing! 6 Pages per minute
- ✓ Interactive on screen status display
- ✓ Windows and PCL™ emulation
- ✓ 1200dpi class laser printing quality (GDI Mode)

EURPR1627 **KX-P6500** €305 (£358.38)
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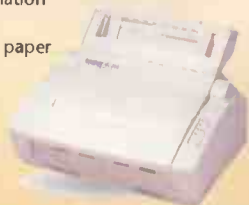


Laser printers from **brother**

HL-730

- ✓ Fast 6ppm laser printer
- ✓ True 600 dpi resolution
- ✓ PCL4 emulation
- ✓ 200 sheet adjustable paper tray

ONLY £265
Including VAT £311.38



HL-760

- ✓ Parallel interface with serial option
- ✓ 1200 x 600 dpi
- ✓ 6ppm
- ✓ 1MB printer memory
- ✓ 12 months return to base warranty
- ✓ PCL5e emulation

ONLY £315
Including VAT £370.13



HL-1660 Laser Printer

- ✓ Fast 16ppm output
- ✓ High print quality
- ✓ Upto 1200 dpi
- ✓ 6,000 page toner

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PR11843 **HL-760 laser printer** €315 (£370.13)

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1200X600 RESOLUTION

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EPSON Stylus Color 400

- ✓ 720x720 dpi printing in colour & mono with Epson MicroDot
- ✓ Photo real colour & laser sharp mono printing as standard
- ✓ Up to 3ppm colour, 4ppm mono printing on plain paper
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- ✓ Prints on plain paper with Epson Quick-Dry ink
- ✓ Includes free Look Your Best Color Pak software pack

Colour printing at
720x720 dpi on plain paper



NEW!
£162
Including VAT £190.35

- ✓ 3 year extended on-site repair warranty
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- ✓ Must be bought within 30 days of product purchase

Peace of mind through reliability

PR12103 Stylus Color 400 £162 (£190.35)

EPSON Stylus Color 600

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- ✓ Photo real Colour and Laser Sharp Mono Printing as standard
- ✓ Windows 95 ICM & Colour Synch. 2 Compliance
- ✓ 1 year RTB warranty with optional 3 year on site warranty
- ✓ Includes Look Your Best Color Pak

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EPSON Stylus Color 800

- ✓ Ultra fast print speed - up to 8ppm mono, 7 ppm colour
- ✓ 1440 dpi with Epson Super Microdot & Epson Super MicroWeave
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- ✓ 1 year RTB warranty with optional 3 year on site warranty

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PA0204	Black Cart for 500/200	£15.95	(£18.74)
PA0205	Colour Cart for 500/200	£21.99	(£25.84)
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EPSON PhotoPC 500

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- ✓ Versatile bundled software - PhotoEnhancer
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High quality
image capture



PR11907
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Stylish Scanners

Epson GT-9500 Scanner

The Epson GT-9500 flatbed colour scanner is the highest quality and most affordable flatbed scanner in its class.

- ✓ 4800dpi
- ✓ 68 billion colours
- ✓ SCSI and Bi-directional interfaces built-in
- ✓ **GTX-5000 Bundle** includes Corel Photopaint 5, CorelDraw 4, Xerox Colour Document Management Suite (includes TextBridge (OCR), Visual Recall (document management) and integrated scan/fax/print software).

GTX-8500 includes Photoshop LE, Textbridge Lite, New Soft Prest, Pagemanager

COVER plus £65 (£76.38)

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£243.95
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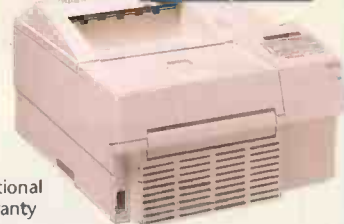


EURIN1350	GTX-5000PCP PAR	£243.95	(£286.64)
EURIN1351	GTX-5000PCS SCSI	£295.95	(£347.74)
EURIN1228	GTX-8500PCP PAR	£402.95	(£473.46)
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IN6044	GTX-9500PCS SCSI	£625.95	(£735.49)
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- ✓ Optional 500 Sheet Paper Cassette
- ✓ Optional LocalTalk Module
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- ✓ Additional Slot for Optional Ethernet Interface
- ✓ 1 Year RTB plus Optional 3 Year On-Site Warranty

AS LOW AS
£255
Including VAT £299.63



PR11952	EPL-N1200 Laser Printer	£695	(£816.63)
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PR11954	EPL-N2000 Laser Printer	£1475	(£1733.13)
PR11953	EPL-N2000PS Laser Printer	£1845	(£2167.88)
EURPR1499	EPL-5500 (1MB)	£328	(£385.40)
EURPR1500	EPL-5500 (2MB)	£369	(£433.58)
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Business Systems

THE NEXT GENERATION!



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Panasync 4

- Features:
- ✓ 17" digital Multi-Scan
 - ✓ Resolution: 1280 x 1024
 - ✓ 0.27mm dot pitch
 - ✓ Compatible with Windows 95

MT1285 PANASYNC 4 £219 (£257.33)

Panasync 5G 17"

- Features:
- ✓ 17" digital Multi-Scan
 - ✓ Resolution: 1280 x 1024
 - ✓ 0.27mm dot pitch
 - ✓ 5 Languages on-screen display
 - ✓ Power Saving functions
 - ✓ Compatible with Windows 95
 - ✓ Colour temperature adjustment function



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Vision Master 17

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- ✓ Up to 1600x1200 @ 75Hz
- ✓ Up to 1280x1024 @ 85Hz
- ✓ Diamond 0.25mm
- ✓ AG tube
- ✓ Flicker free refresh
- ✓ On-screen display



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EURMT0318 '509 (£598.08)

Vision Master Pro 21

MT-9021T

- ✓ High contrast 21" DiamondTron screen 0.30mm aperture grill
- ✓ Auto-selection of 15 pin D-sub or BNC inputs
- ✓ Flicker free display up to 1600 x 1200 @ 90Hz
- ✓ VESA-DPMS, Energy Star and NUTEK power saving compliant



MT1324 '959 (£1126.83)

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EURMT0532	MF-8221T	21" Monitor	£925	(£1086.88)

On-Site warranties available.

SONY Trinitron® Digital Displays

Multiscan 100sx

- This monitor is the latest entry level Trinitron based display. This generation of monitors offer the unique Super Fine pitch aperture grille allowing more light to reach the screen resulting in a brighter picture and clearer contrast.
- ✓ 15" Trinitron CRT tube
 - ✓ Digital Multiscan Technology
 - ✓ 0.25mm Aperture grille
 - ✓ Windows 95 Plug & Play
 - ✓ Resolutions up to 1280 x 1024 @ 60Hz



NEW! **ONLY £255**
Including VAT (£299.63)

MON0419 £255 (£299.63)

Multiscan 200SX

- This model features easy to use on-screen controls including colour temperature and pincushion distortion. The monitor supports Windows 95 Plug & Play compatibility and also new VESA DPMS power saving standard.
- ✓ 17" Trinitron CRT tube
 - ✓ 0.25mm Aperture grille
 - ✓ Resolutions up to 1024 x 768 @ 85Hz
 - ✓ Low Radiation MRPII



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MT1340 £445 (£522.88)

EURMT0456	15SF2	15" Multiscan	£295	(£346.63)
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EURMT0488	20SF2	20" Multiscan	£1069	(£1256.08)
EURMT0247	20SE2	20" Multiscan	£1385	(£1627.38)

Techno Vision Monitors

Multimedia Model includes:

- ✓ 0.28mm Dot Pitch
- ✓ Resolutions up to 1024 x 768 @ 60Hz
- ✓ Low radiation
- ✓ Built-in speakers & microphone

New Multimedia Model

FROM £149
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	14"	15"	15"Multimedia 17"	17"
Max Res (Ni)	1024x768	1280x1024	1024x768	1280x1024
Horiz Freq Khz up to	48	30-60	30-50	30-68
Vert Freq Hz	50-90	50-90	50-100	50-120
	£149	£195	£235	£349
	EURMT0280	EURMT0281	BN3890	EURMT0282
	(£175.08)	(£229.13)	(£276.13)	(£410.08)

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	✓	32-Bit Advance Logic Chipset		
	✓	Windows 95 drivers		
	✓	Upgradable to 2MB		
Matrox	EUREX1111	Millennium PCI 2MB	'119	(£139.88)
	EUREX1112	Millennium PCI 4MB	'165	(£193.88)
	EX7247	Mystique 3D PCI 64bit 2MB SGRAM	'109	(£128.08)
	EX7246	Mystique 3D PCI 64bit 4MB SGRAM	'139	(£163.38)
Orchid	EURDR4588	Kelvin Video 64 DRAM 1MB PCI	'75	(£88.13)
	EURDR1589	Kelvin Video 64 DRAM 2MB PCI	'129	(£151.58)
	EX7428	Righteous 3D 4MB PCI	'179	(£210.33)
Diamond	EUREX2751	Diamond Edge 3D 2MB DRAM PCI	'229	(£269.08)
	EUREX2752	Diamond Edge 3D 2MB VRAM PCI	'279	(£327.83)
Video Logic	EUREX2872	Grafixstar 600 2MB MDRAM PCI	'85	(£99.88)
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ERGOVISION 530 LR

- ✓ 15" FST Digital Monitor
- ✓ 0.28mm Dot Pitch
- ✓ AGRAS Face Treatment
- ✓ 30-65kHz (Multiscan)
- ✓ 1024 x 768 up to 80Hz
- ✓ Windows 95 Plug & Play

EURMT0516



ERGOVISION 740 TCO 95-S

- ✓ 17" FST Digital Monitor
- ✓ 0.26mm Diagonal Dot Pitch
- ✓ 30-85kHz (Multiscan)
- ✓ Multimedia Version
- ✓ Fully TCO 95 Compliant
- ✓ 1280 x 1024 up to 79Hz
- ✓ Volume & Mute Control

MT1239



ERGOVISION 730 TCO

- ✓ 17" FST Digital Monitor
- ✓ 0.28mm Dot Pitch
- ✓ AGRAS Face Treatment
- ✓ 30-69kHz (Multiscan)
- ✓ 1024 x 768 up to 85Hz
- ✓ Windows 95 Plug & Play

MT1274



ERGOVISION 2040 TCO

- ✓ 20" Digital Monitor
- ✓ 0.28mm Dot Pitch
- ✓ AGRAS Face Treatment
- ✓ 30-82kHz (Multiscan)
- ✓ Fully TCO 92 Compliant
- ✓ 1024 x 768 up to 76Hz
- ✓ Windows 95 Plug & Play

MT1369

2040 TCO 95 Available



ERGOVISION 730 TCO-S

- ✓ 17" FST Digital Monitor
- ✓ Multimedia Version
- ✓ Built-in Speakers
- ✓ Built-in Microphone
- ✓ Headphone Socket
- ✓ Volume and Mute Control

EURMT0472



CRYSTALVISION 650

- ✓ 14.5" TFT Flat Panel Monitor
- ✓ Equivalent to 17" CRT Monitor
- ✓ 1024 x 768 Flicker Free
- ✓ No special interface required
- ✓ 200 cd/m2 Brightness
- ✓ Fully TCO 92 Compliant
- ✓ Windows 95 Plug & Play

MT1170



Monitors:

EURMT0249	Ergovision 410 LR	£174	(£204.45)
MT1238	Ergovision 540 TCO 95-S	£274	(£321.95)
MT1275	Ergovision 740 TCO	£496	(£586.80)
MT1317	Ergovision 750 TCO 95	£503	(£591.03)
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EX7270	GTS UK PAL TV/Teletext Tuner Upgrade	£85.00	(£99.88)

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QV300

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- ✓ High Resolution Square CCD
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Kodak *ds* DC-25

- ✓ 24-bit colour
- ✓ Resolution up to 493 x 373 pixels
- ✓ Built-in colour LCD screen
- ✓ Automatic flash
- ✓ Up to 160 images can be stored (with 4MB expansion)



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Datawise™

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DR5888 12x £279 (£327.83)



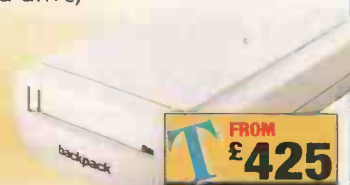
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PCMCIA with Audio CD
DR5487 6x £239 (£280.83)

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MicroSolutions Backpack

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Visioneer PaperPort

**ONLY
£179**
including VAT £210.33

**ONLY
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- ✓ Stand-alone unit for Windows or Mac
- ✓ Great flexibility: take it on the road or move it around the office

- ✓ Integrated with high-quality Windows 95 keyboard with 3 Windows short-cut keys
- ✓ Ideal for those who need to save desk space
- ✓ Visioneer FormTyper: just "tab and type" to fill out forms

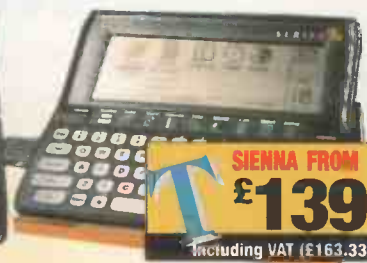
Visioneer PaperPort, More than just a scanner

Managing paper doesn't get any easier! The award winning PaperPort isn't just another scanner, it's the world's most popular paper management system.

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- ✓ Exclusive SharpPage technology
Improves the readability of text and images
- ✓ Unique ASIC chip: Compresses file sizes and increases scanning speeds
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- ✓ Send files anywhere: Simply send the FREE PaperPort viewer along too.
- ✓ Annotate: Mark-up documents with text, drawing tools, sticky note and freehand drawing
- ✓ Free Software: PaperPort comes with OCR Software to save hours of retyping and Corex Card Scan SE which reads business Cards and creates a card file

CM2032 PaperPort ix £199 (£233.83)
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Psion 3c & Siena Organisers



**SIENNA FROM
£139**
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- Greyscale screen 480x160 pixels (Supports full A4 width)
- Touch-sensitive button-pad for quick application access
- 2 SSD drives for memory expansion up to 16Mb and extra plug-in software
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- Telephone autodialer
- International speaker for alarm call and sounds
- Fully functional QWERTY keyboard with up to 244 characters
- PC Link up with PsiWin (optional)
- Word processor - full range of styles and emphases, plus spellchecker and Thesaurus
- InfraRed transmitter for beaming data to compatible printers or other infrared enabled Psion palmtops
- Agenda Day, Week views, 1, 3, 12 month calendar, 4-week busy view, ToDo's Anniversaries Reminder alarms
- Database fully customisable
- Spreadsheet fully features and graphical options
- World Information - approx 500 cities, customisable
- Jotter - free form notetaker
- Multi-function alarm clock
- Digital Sound recorder/editor
- Scientific calculator
- File manager
- Patience card game
- OPL, programming language and Oval Supporter

CP3745 Psion Series 3C 2MB Organiser £309 (£363.08)
CP3746 Psion Series 3C 1MB Organiser £275 (£323.13)
CP3773 Psion SIENNA 1MB Personal Organiser £189 (£222.08)
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Psion Siena Personal Organiser

Packed with many of the great features of the remarkable new Series 3c, including a spreadsheet and wordprocessor, the Siena combines functionality with great style, portability at a truly affordable price.

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Features

- ✓ Zoom & scroll without clicking a button with Intellimouse wheel
- ✓ Front weighted ball
- ✓ Solid tactile feel

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EURUT1270 Microsoft Mouse V2 £35.95 (£42.24)



**ONLY
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including VAT (£57.58)

Features

- ✓ Designed for maximum comfort
- ✓ Split-key sloped design promotes natural wrist posture
- ✓ Designed for Windows '95
- ✓ Simple keyboard functionality

IN5317 Natural Keyboard £49.00 (£57.58)

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**FROM
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including VAT (£182.13)

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EX6811	Discovery 32 8X PNP Kit	£155.00	(£182.58)
EX7337	Soundblaster 16 Value PNP & Interneted S/W	£65.00	(£78.38)
EX7336	Soundblaster 32 PNP & Interneted S/W	£79.95	(£93.94)
EX7336	Soundblaster AWE64 PNP & Interneted S/W	£119.95	(£139.38)

SCSI & IDE CD Drives

DVD			
DR5854	Toshiba 4.7GB Internal SCSI Bare	£275.00	(£323.13)
IDE			
DR5253	PowerUser 8X Internal IDE	£59.00	(£69.33)
DR5631	Toshiba 8X Internal IDE	£69.00	(£81.08)
DR5857	PowerUser 10X Internal IDE	£75.00	(£88.13)
DR5635	Aztech 12X Internal IDE	£85.00	(£88.99)
DR6008	Pioneer 12X Internal IDE	£109.95	(£129.19)
DR6020	Goldstar 16X Internal IDE	£99.00	(£116.33)
SCSI			
DR5367	NEC 8X Internal SCSI	£139.00	(£163.33)
DR5368	NEC 8X External SCSI	£205.00	(£240.88)
DR5853	Toshiba 12X Internal SCSI	£135.00	(£158.83)
DR6010	Pioneer 12X Internal SCSI	£139.95	(£164.44)



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SureStore Tape 2000 2GB DDS

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SureStore Tape 5000 4GB DDS

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SureStore 12000 Autoloader 48GB

- ✓ 48GB of reliable, high performance storage
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Affordable capacity and speed for today & tomorrow

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- ✓ 4GB native/8GB compressed (2:1) capacity
- ✓ Up to four times faster than floppy interface drives
- ✓ Transfer rate up to 62MB per minute

Information storage today demands more for less. The explosion in multimedia and Internet access requires ever increasing backup and secondary storage capacity and speed. The T4000 is the ideal backup solution for 1GB and higher hard drives for both stand-alone PC's and workgroup systems.

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- ✓ Network ready backup solution
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DR4816	T1000e 400/800MB Travan Drive Ext Par	£96.50	(£113.39)
DR5623	T3000i 1.6/3.2GB Int	£119.00	(£139.83)
EURDR4634	T4000s 4/8GB Travan Drive Int SCSI	£229.00	(£269.08)
DR5624	T4000es 4/8GB Travan Drive Ext SCSI	£289.00	(£339.58)
EURDR0902	T2000i 2GB DAT Drive Int SCSI	£459.00	(£539.33)
EURDR0897	T2000e 2GB DAT Drive Ext SCSI	£529.00	(£621.58)
EURDR0903	T5000i 4GB DAT Drive Int SCSI	£519.00	(£609.83)
EURDR0898	T5000e 4GB DAT Drive Ext SCSI	£597.00	(£703.83)
EURDR0904	T6000i 8GB DAT Drive Int SCSI	£645.00	(£757.88)

Code	Item	Price	Inc VAT
EURDR0899	T6000e 8GB DAT Drive Ext SCSI	£739.00	(£868.33)
EURDR0905	12000e 48GB Autoloader DAT Drive Ext SCSI	£1799.00	(£2113.83)
DR5720	30e 15/30GB DLT Drive External SCSI	£2785.00	(£3272.38)
DR5721	40e 20/40GB DLT Drive External SCSI	£3675.00	(£4318.13)
DR5792	T4i 4/8GB Network Travan Internal SCSI	£289.00	(£339.58)

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EURME1099	400/800MB Travan Tape	£25.95	(£30.49)
ME6979	1.6/3.2GB Travan Tape	£27.95	(£32.84)
ME6889	4/8GB Travan Tape	£34.95	(£41.07)
EURME1079	2GB DAT Tape 5 Pack	£55.95	(£65.74)
EURME1080	4GB DAT Tape 5 Pack	£95.95	(£112.74)
ME7020	15/30GB DLT Tape	£60.00	(£70.50)
ME7021	15/30GB DLT Tape	£127.00	(£149.23)

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**1 Zip Drive Holds 70 times more than
a floppy and is up to 20 times faster**

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- ➔ Unlimited storage capacity!
- ➔ Ultra-compact for easy transport!
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Add unlimited hard drive capacity to your system with an Iomega Zip Drive. Store data on inexpensive 100MB 3.5" disks.

Features quality and performance!

Competitive transfer rate of 1.4MB/s and seek time of 29ms.

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Disks
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The **Lowest cost per MB backup solutions**

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Jaz Drives and Media

- ✓ Backup 1GB of Data in five minutes!
- ✓ Faster than most hard drives! Works as fast as you do!
- ✓ Back up your entire system in minutes!
- ✓ Small, portable, and convenient — weighs only a little more than two pounds!

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iomega Drives			
Item	Description	Price	Inc VAT
DR5402	Ditto 2GB Internal	£85.00	(£99.88)
DR5401	Ditto 2GB Parallel**	£105.00	(£123.38)
ME6953	2GB Tape	£15.50	(£18.21)
ME6954	2GB Tape Triple pack	£39.50	(£46.41)
DR4723	Ditto Easy 3200 Internal	£145.00	(£170.38)
DR4724	Ditto Easy 3200 Parallel**	£165.00	(£193.88)
DR4719	Ditto Dash 2MB/Sec Controller	£35.00	(£41.13)
EURDR4559	Jaz Internal SCSI	£265.00	(£311.38)
EURDR4560	Jaz External SCSI	£319.00	(£374.83)
EURME1268	Jaz Cartridge 1GB	£69.00	(£81.08)
BN3876	5 Pack of Jaz Cartridges	£325.00	(£381.88)
AC19904	Jaz Carrying Case	£25.50	(£29.96)
DR4602	Zip Drive External Parallel**	£109.00	(£129.19)
EURDR0847	Zip Drive External SCSI*	£109.00	(£129.19)
EURDR4672	Zip Drive Internal SCSI*	£109.00	(£129.19)
ME6387	Zip Cartridge 100MB	£12.00	(£14.10)
ACC1816	Large Zip Carry Case	£25.50	(£29.96)

*High performance SCSI interface card required for connecting the Zip Drive SCSI model to PCs.
** Parallel port drives do not allow bidirectional functionality on HP printers.

**NEW! Zip Drive
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- ★ You get: Parallel Port Drive!
- ★ Triple Pack of 100MB Disks + Zip tools
- ★ Large carry case!

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SIZE	MANUFACTURER	MODEL	ITEM (MS)	ACCESS	CACHE	WARRANTY	PRICE	INC IDE VAT
850MB EIDE	WESTERN DIGITAL	AC2850A	EUREX0824	10	64	3	£105	£123.38
1.2GB EIDE	SEAGATE MEDALIST	ST31276A	DR5662	12.5	64	3	£115	£135.13
1.2GB EIDE	WESTERN DIGITAL	AC31200A	EURDR1293	10	64	3	£125	£146.88
1.6GB EIDE	WESTERN DIGITAL	AC31600A	EURDR1515	10	128	3	£135	£158.63
1.7GB EIDE	SEAGATE MEDALIST	ST31720A	DR5656	12	128	3	£145	£170.38
1.8GB EIDE	QUANTUM FIREBALL	FB1780A	DR5781	10.5	128	3	£155	£182.13
2.1GB EIDE	QUANTUM BIGFOOT	BF2150A	DR5672	15.5	128	3	£139	£163.33
2.1GB EIDE	QUANTUM FIREBALL	FB2110TMA	DR5673	10.5	128	3	£159	£186.83
2.1GB EIDE	SEAGATE MEDALIST	ST32132A	DR5670	12.5	128	3	£189	£222.08
2.1GB EIDE	WESTERN DIGITAL	AC321000	DR5427	12	128	3	£155	£182.13
2.5GB EIDE	QUANTUM BIGFOOT	2550A	EURDR4664	15.5	128	3	£145	£170.38
2.5GB EIDE	SEAGATE MEDALIST PRO	ST52520A	DR5674	11	128	3	£199	£238.88
2.5GB EIDE	WESTERN DIGITAL	AC32500	DR5439	12	128	3	£175	£205.63
3.1GB EIDE	QUANTUM FIREBALL	FB3110TMA	DR5669	10.5	128	3	£249	£292.58
3.8GB EIDE	QUANTUM FIREBALL	FB3840TMA	DR5778	10.5	128	3	£239	£280.83

SIZE	MANUFACTURER	MODEL	ITEM (MS)	ACCESS	CACHE	WARRANTY	PRICE	INC IDE VAT
1.05GB	SEAGATE HAWK 2XL	ST31051N	EURDR4573	10.5	256	5	£225	£264.38
2.1GB	QUANTUM FIREBALL	FB2110TMS	DR5725	10.5	128	3	£229	£269.08
2.1GB	SEAGATE HAWK 2XL	ST32155W	EURDR4606	9	512	3	£379	£445.33
2.14GB	SEAGATE BARRACUDA	ST32550N	DHD1034	8	512	5	£479	£562.88
3.2GB	QUANTUM FIREBALL	FB3200TMS	DR5726	10.5	128	3	£269	£316.08
4.0GB	SEAGATE HAWK	ST15230N	DR4533	10.5	512	5	£639	£750.83
4.3GB	SEAGATE BARRACUDA	ST34371WC	DR5754	8	512	3	£799	£938.83
4.55GB	MICROPOLIS TOMAHAWK	4345	DR5774	7.9	512	5	£689	£809.58
4.55GB	MICROPOLIS TOMAHAWK	4345W	DR5773	7.9	512	5	£725	£851.88
9GB	SEAGATE ELITE	ST410800N	DR4491	11	1000	5	£1249	£1467.58
9.1GB	MICROPOLIS TOMAHAWK	3391	DR5794	7.9	512	5	£1429	£1679.08
9.1GB	MICROPOLIS TOMAHAWK	3391W	DR5775	7.9	512	5	£1395	£1689.15
4GB	SEAGATE CAYMAN	ST14207N	DR5847			3	£695	£818.63
4.3GB	SEAGATE BARRACUDA	ST34371N	DR5839	8	512	3	£769	£903.58



AZTECH WaveRider Pro 32-3D

- ✓ 32 voices WaveTable playback
- ✓ Built-in 3D sound effects
- ✓ Windows 95 PnP
- ✓ IDE Interface
- ✓ Includes headphones
- ✓ MIDI interface



EX7380 £45 (£52.88)

Buy the WaveRider 32 and Zeta 12X for only £115 (£135.13)

Ask for BN4090

AZTECH ZETA 12X CD-ROM

- ✓ transfer rate of 1800KB/sec
- ✓ Seek line: 145ms
- ✓ Built-in CD-I compatibility allows MPEG video playback on desktop
- ✓ Features Quick CD Play button for audio playback without software



DR5635 12X Int £85 (£99.88)

DR5496	Zeta 10X CD-ROM Drive	£79.00	(£92.83)
EX7589	Video Phone	£249.00	(£292.58)
EX7372	Audio Web 28.8 Comms Centre	£125.00	(£146.88)
	<small>Includes 28.8 modem, digital telephone answering, 16-bit sound card</small>		
AC20636	Sound Galaxy Microphone	£6.95	(£8.17)
AC21487	FX-20 Speakers	£9.95	(£11.69)

adaptec

APA-1460A SlimSCSI

- ✓ Instant connection for portables using the PCMCIA slot
- ✓ Fast 10MB/sec transfer rate
- ✓ Rugged Type II design and also compatible with Type II & Toshiba Type IV
- ✓ Includes EZ-SCSI v4.0. The all in one solution

EUREX0601 £115 (£135.13)

AHA-2920 PCI-KIT

- ✓ Fast PCI data transfer for desktop applications
- ✓ Extensive set of convenient SCSI applications
- ✓ Easy Plug 'n Play installation of up to 7 devices

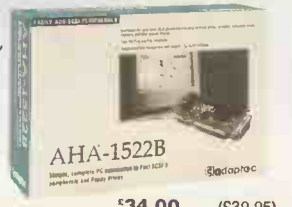
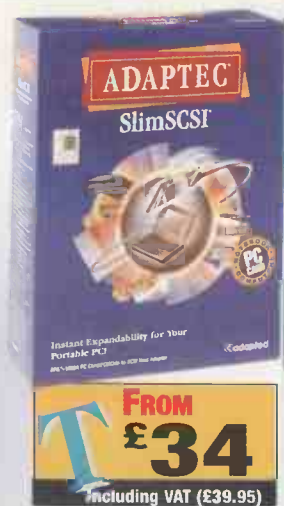
EUREX2748 £95 (£111.63)

AHA-1522B SCSI Direction Kit

- ✓ Transfer rate of 10MB/sec
- ✓ Compatible with DOS, Windows 95, OS/2, Network and Unix
- ✓ Plug and play ISA host adapter
- ✓ Kit includes internal SCSI cable for connecting two peripherals and full documentation

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EUREX0631	AVA-1505 Total CD	£34.00	(£39.95)
EX6243	AVA-1515 Total Connect	£55.00	(£64.63)
EX3980	AHA-2742AT EISA SCSI Master II	£225.00	(£264.38)
EX7250	AHA-2940AU PCI Ultra SCSI Master	£155.00	(£182.13)
EX6683	AHA-2940UW PCI Ultra Wide SCSI	£189.00	(£222.08)
EUREX2476	AHA-3940U PCI Multichannel	£259.00	(£304.33)
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EURDR4626 External £529 (£621.58)

CDM-460

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EX7588 Adaptec SCSI controller £29.95 (£35.19)



Everything you need to read and your own CD at hand in the CD

**CD RECORDERS FROM ONLY
£249.95**
(£293.69)

Ultimate Hassle-free Quad speed CD-Recording & Duplication

DynaTek CDM4000

The DynaTek CDM-4000 simplifies the whole process of CD recording. The magic is in the design.

Everything you need to record

CDs is contained in a single external unit, including 4x CD Recorder, 4x CD reader, 1GB AV hard drive and a specially designed controller to make it all work.

The CDM-4000 guarantees an uninterrupted data path from the hard drive to the recorder, reducing wasted media. The unique system also allows you to continue using your computer while it's recording, so you can continue your work. With its separate quad speed reader, duplicating CDs is also simplicity itself. (subject to copyright restrictions)

The CDM-4000 comes with 10 blank CDs and is available with software for either Windows 3.x, Macintosh or Unix.

Windows	EURDR4627	£1995	(£2344.13)
Macintosh	DR5371	£1895	(£226.63)
Unix	DR5610	£3495	(£4106.63)



**CDM-4000
EURDR4627
£1995**
Including VAT (£2344.13)

HP SureStore CD-Writer 6020

The HP SureStore CD-Writer 6020 range offers a complete solution for archiving and distributing information - and is compatible with industry standard CD-ROM technology. Whether you need to distribute data-intensive files, such as multimedia presentations and graphics, or archive and retrieve large amounts of data with ease.

- ✓ Internal and External 6x Reader / 2x Recorder
- ✓ The easiest way to make your own CD's
- ✓ Organise, distribute and archive your files
- ✓ Share up to 650 Megabytes of data or 74 minutes of audio
- ✓ Includes CD-R Drive, installation disk, applications software on CD for Windows 95 & Windows 3.x, one blank CD-R disk and manuals
- ✓ 1 year, 24 hour Express Warranty

**FROM
£349**
Including VAT (£410.08)



DR5722	SureStore CD-Writer 6020i Internal	£349	(£410.08)
DR5723	SureStore CD-Writer 6020es External SCSI	£479	(£562.83)
DR5724	SureStore CD-Writer 6020ep External Parallel	£479	(£562.83)
ME6475	HP CD-R 650MB 74 Min Recordable CD 5 Pack	£49	(£57.58)

The NEATO CD Labeller Kit.

**Labels your CDs
Easily, Quickly,
Accurately.**

- ✓ Everything in one CD LABELLER KIT
- ✓ Print labels using your existing laser or inkjet printer in colour or B&W
- ✓ Design, print & apply. 3 simple steps produce perfectly applied labels to your own design
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Kit Includes:

- ✓ The NEATO CD Label Applicator
- ✓ Sets of assorted Labels
- ✓ DesignExpress Labels™ Software for Windows
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NEATO™

AC20576	CD Label Kit	£55.00	(£64.63)
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The Sportster 28,800 XJACK provides fast V.34 data and fax communications for the mobile user.

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DMD1773

USR Sportster 28.8

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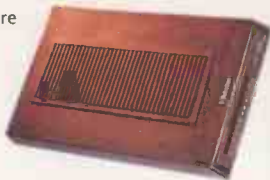


£129
including VAT (£151.58)

Courier Dual Standard V.34 Fax

The Courier V34 combines the very latest industry standards with an extensive feature set.

- ✓ V.34 + 36,600bps data rates
- ✓ Flash Upgradeable to X2-56Kb
- ✓ V17 14,400bps fax
- ✓ Dial back security
- ✓ Flash memory (Upgradeable)



DMD1315 USR Courier V34 Ext Fax/Modem+Free Port £195 (£229.13)

DMD1316 USR Courier V34 Int Fax/Modem £195 (£229.13)

Courier I-Modem V.34/ISDN

Get the best of both worlds with this combined V.34+ modem and ISDN

MM3994 USR Courier I-Modem ISDN/V34 Ext. £275 (£323.13)

MM3993 USR Courier I-Modem ISDN/V34 Int. £275 (£323.13)

FaxModem with personal Voice Mail

Provides Internet Access, fax, email, personal voice mail and speakerphone capability all in one compact unit. Now you even have the option to upgrade to the latest X2 56Kbps Internet access technology

Two new modems launched

NEW! Sporster Voice 33.6 FLASH external
Flash upgradeable version of the Sporster 336 Voice
Flash upgrade to X2 will be free of charge. The Sporster Voice 336 is chip upgradeable to X2 but will cost extra.

NEW! Sporster Voice Winmodem Internal
Full 336 voice modem that uses Windows software for compression and error correction

MM4047 USR Sportster 336 Voice Winmodem Internal £75 (£88.13)

MM USR Sportster 336 Flash x2 Voice Modem £155 (£182.13)

DMD1773 USR Sportster Voice 33.6 Ext. Fax/Modem £129.95 (£152.69)

DMD1584 USR Sportster Voice 33.6 Int. Fax/Modem £129.95 (£152.69)

ONLY £129.95
including VAT (£152.69)



NEW FLASH MODEM

Connection to systems specified in the literature is not subject to the Conditions set out therein.

Speakerphone allows your Sportster Voice to be used as a hands free telephone. (Requires soundcard)



pilot™—The One Touch Organizer

- ✓ Your diary is with you at all times with personal notes and an alarm function for particular events.
- ✓ Have your PC information at hand. Keep notes using the Graffiti hand recognition software or on-screen keyboard.
- ✓ Pilot stores thousands of addresses, contact numbers, appointments and personal notes, yet fits into your shirt pocket and weighs less than 6 ounces.
- ✓ Pilot comes with everything you need to enter, edit, import and export information to and from your PC at a touch of a button.

With one touch you can have your PC information at hand—wherever you are. Addresses, diary, memopad, to-do list and calculator all in one compact unit, and small enough to fit into your shirt pocket.

Your pilot and PC are in sync within seconds as information is transferred in either direction, simply by placing pilot into its cradle and hitting the "HotSync" button. Pilot comes complete with all the necessary desktop and organiser software you'll need with no hidden or additional extras to get the functionality and connectivity you want. Complete with Windows software.



FROM ONLY £165
including VAT (£193.88)

AC20372

Pilot 1000 £165 (£193.88)

Stores 500 addresses, 1 year (600) of appointments, 100 to do items and 50 memos

AC20373

Pilot 5000 £195 (£229.13)

Stores 2500 addresses, 4 years (2400) of appointments, 500 to do items and 50 memos

US Robotics "our word is don't be without one"—computer shopper

Avro Pacific Avro Pacific International Modem Adapter Kits

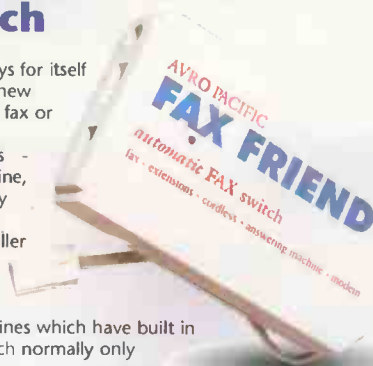


AVRO PACIFIC KITS allow you to connect your modem or PCMCIA card to International telephone systems. Fully modular with smart and convenient carry case. THE INTERNATIONAL KIT connects you to more than 150 countries including most of Western Europe, Far & Middle East, Scandinavia, USA and Canada.

EURAC2938 '39 (£45.83)

Avro Pacific Automatic Fax & Modem Switch

- ✓ FAX FRIEND immediately pays for itself by replacing the need for a new dedicated telephone line for fax or modem
- ✓ Eliminates line rental charges - Telephone, answering machine, fax or modem work normally
- ✓ No re-wiring plugs into any extension. Invisible to the caller with no recorded voices, tones or clicks. All extensions work normally.
- ✓ Extends the use of fax machines which have built in Fax/Telephone switches which normally only operate with a single telephone.
- ✓ Remote control of fax machine from any extension.



EURAC2938 '49.95 (£59.00)

Simple no need for a dedicated fax/Internet data line

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HAYES MODEMS

**Compatibility Reliability
Ease of Use**

Hayes ACCURA 336 Message Modem DATA • FAX • VOICE

The ACCURA 336 Message Modem combines the features of a 33,600 bit/s modem, a fax machine, a fax-back service and an answerphone.

- ✓ Now also available as an internal card
- ✓ Unique data/fax/voice discrimination
- ✓ Remote voice and fax message retrieval
- ✓ Includes Quarterdeck InternetSuite 2 and WebTalk software on CD
- ✓ Includes Message Centre Software on 3.5"



**Accura 336 Message Modem
BN3863** £129 (£151.58)

OPTIMA 336 Business Modem Voice/Data/FAX

- ✓ Upto 230,400bit/s with unique 8:1 data compression
- ✓ Remote configuration
- ✓ Dial-back security
- ✓ Voice/Data/fax discrimination on a single telephone line
- ✓ Flash ROM upgradeable



**DMD1546
Optima 336 Business Modem** £199 (£233.83)

ACCURA ISDN

NEW!

Hayes ACCURA ISDN is one of the fastest and best priced basic rate (ISDN2) products available. Performance is four times the throughput of V.34 modems and twice the throughput promised by 56 Kbps modems. With 100% implementation of the Hayes Standard AT Command Set and the same PC serial port used on modem applications to the ISDN is simple and easy. The provision of 2 analogue ports lets you use a fax modem, phone or fax machine over an ISDN Line when needed.

- ✓ Multilink PPP
- ✓ V.42 Bis Compression
- ✓ 460.8Kbps Maximum Throughput
- ✓ V.120/V.110 Rate Adaption
- ✓ 2 Analogue ports
- ✓ Bandwidth on demand
- ✓ Call Bumping
- ✓ Calling Line Identification
- ✓ Dial Back Security (40 users)
- ✓ Flash upgradeable
- ✓ Plug and Play

**MM4051
Accura ISDN** £199 (£233.83)

Hayes™	INTERNAL/EXTERNAL	VOICE	FAX ON DEMAND	FAX SEND/RECEIVE	MAXIMUM THROUGHPUT	DATA COMP	ERROR CORRECTION	REMOTE CONFIG.	SYNC/AUTO SYNC	FLASH UPGRADEABLE	PART NUMBER	PRICE EXC VAT	PRICE INC VAT
ACCURA 336 Message	E	✓	✓	✓	115.2	✓	✓				MM4017	£129	£151.58
ACCURA 288 + Internet Delux	E			✓	115.2	✓					EURMM0675	£99	£116.33
OPTIMA 336 Business	E	✓	✓	✓	230.4	✓	✓	✓	✓	✓	MM4018	£199	£233.83
OPTIMA 336 PC CARD	P			✓	115.2	✓			✓	✓	MM4019	£159	£186.83
ACCURA 336 DATA/FAX	I			✓	115.2	✓					DMD2186	£110	£129.25
ACCURA 336 DATA/FAX	E			✓	115.2	✓					MM4020	£110	£129.25
ACCURA 336 DATA/FAX/VOICE	I	✓	✓	✓	115.2	✓					DMD2185	£129	£151.58

Get Connected

- Any way you like it with Motorola
- A World Leader in Communications

All modems have a 5 year warranty

28,800bps **NOW ONLY £95** (£116.33)



Premier 33.6 Data/Fax Modem

This high performance V.34/V.42bis data and fax modem allows you to transmit at 33.6kpb in sync and async environments and is capable of async throughput rates upto 268.8kps.

- ✓ V.34 33600, 31200, 28800 Data Rates
- ✓ MNP2.4: V.42/V.42bis
- ✓ Group III, Class 1, V.17 with T.30 Fax
- ✓ 8:1 DTE rates for 268,800bps async
- ✓ Multi level security with Callback
- ✓ 2-Wire Leased Line operation
- ✓ Synchronous with V.25bis dialing
- ✓ Autodial/Autoanswer



MM3954 Premier 33.6 £169 (£198.38)

PCMCIA 33.6 Data/Fax for PC and Mac

Motorola's PCMCIA 33.6Kbps data fax modem bridges the divide between PC and MAC platforms by providing complete compatability on both Apple Macintosh and PC laptops offering users unsurpassed flexibility, high performance and value for money.

- ✓ 33.6Kbps to 300 bps data
- ✓ Group III compatible V.17 14.4Kbps fax
- ✓ Delrina fax and communications software for Pcs
- ✓ Microphone LT and SFT Technologies fax and communications software for Mac
- ✓ Free month's Compuserve membership (PC and MAC CDs included)
- ✓ 5-Year Warranty



MM4016 PCMCIA 33.6 PC & Mac Modem £135 (£158.63)
MM3953 PCMCIA Pro 28.8 Pan euro £165 (£193.88)

3400 Online Internet Solution

7 Great Reasons why the Motorola 3400 Online V.34 28.8 Data/Fax modem is ideal for your home and office environment:

- ✓ Easy
- ✓ Fast
- ✓ Motorola Quality
- ✓ Efficient
- ✓ Complete - all you need to get online in minutes, including Internet software and online access to an Internet service provider
- ✓ Support
- ✓ Editors Choice - PCW February 96



**EURMM0486
3400 Pro Desktop Modem** £95 (£111.63)

**EURMM0485
3400 On-line Modem** £99 (£116.33)

BitSURFR Pro ISDN Office Solution

Access the power of ISDN for all your home or office communications - Save on on-line charges

Five great reasons to install BitSurfr Pro and ISDN.

1. Over four times the speed of the fastest analogue modem - 128,00bps!
2. Two analogue device ports
3. Everything you need for connecting to ISDN
4. Multilink PPP for ultra high speed access to the internet
5. Simultaneous voice and data on a single ISDN line

EURM0701 BitSURFR Pro ISDN TA £299 (£351.33)

Also available for Mac (DMD1490)



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3Com Etherlink III Cards 3Com at Incredible Prices!

3Com Etherlink III adapters raise the standards for ethernet network interface card performance. Their Parallel Tasking architecture speeds data transfer by simultaneously performing multiple tasks. 3Com Fast Etherlink XL PCI 10/100 adapters (3C905-TX) offer the highest network performance and best value available. The new DynamicAccess is built into this 3Com adapter as active network components, with continuous enhancements that network performance



Claim your **FREE OfficeConnect 8 port hub** when you order **DEC1474**

3Com Part #	1 Single	Inc VAT	5 Pack	Inc VAT	20 Pack	Inc VAT
3C509bTPO Etherlink III UTP only	DEC14713 £61.95	£72.79	DEC1474 £259.95	£305.44	DEC1475* £949	£1115.08
3C509bTP Etherlink III UTP/AUI	DEC1470 £64.95	£76.32	DEC1471 £289.95	£340.69	DEC1472 £1049	£1232.58
3C509BTPC Etherlink III BNC/UTP	DEC2425 £64.95	£76.32	DEC2426 £309.95	£364.19	DEC2427 £1139	£1338.33
3C509B Combo Etherlink III Combo	DEC1477 £69.95	£82.19	DEC1478 £319.95	£375.94	DEC1479 £1149	£1350.08
3C592TPO Etherlink III UTP 32-bit EISA	DEC1116 £114.95	£135.07	DEC1180 £319.95	£810.94	-	-
3C900-TPO Etherlink III XL PCI UTP only	DEC2235 £68.95	£81.02	DEC2236 £329.95	£387.69	DEC2337 £1229	£1444.08
3C900 Combo Etherlink XL Combo	DEC2234 £84.95	£99.82	DEC2233 £389.95	£458.19	DEC2332 £1489	£1749.58
3C592 Combo Etherlink III Combo 32-bit EISA	DEC1115 £124.95	£146.82	DEC1179 £579.95	£681.44	-	-
3C590TPO Etherlink III PCI UTP only	DEC1637 £79.95	£93.94	DEC1638 £369.95	£434.69	DEC1663 £1249	£1467.58
3C590 Combo Etherlink II PCI Combo	DEC1568 £99.95	£117.44	DEC1592 £469.95	£552.19	DEC1664 £1729	£2031.58
3C905-TX FastEtherLink 10/100 PCI	DEC2338 £79.95	£93.94	DEC2340 £379.95	£446.44	DEC2329 £1399	£1643.83
3C597-TX FastEtherLink 10/100 EISA	DEC1653 £159.95	£187.94	DEC1654 £769.95	£904.69	-	-

3Com SuperStack II Hubs

SuperStack™ II Hubs are stackable hubs that provide complete media flexibility and manageability. With low initial investment, the SuperStack II Hub allows you to increase port density, add on comprehensive, yet easy to use SNMP management, and provides features like high performance RMON, resilient links, and powerful security. 3Coms SuperStack II systems gives you a simple, cost-effective connectivity solution for local, wide area and SNA networks. With SuperStack II, you can combine diverse technologies and network services in one stacked system, strengthen it with power system and resilience, and manage it all with Transcend® management software.

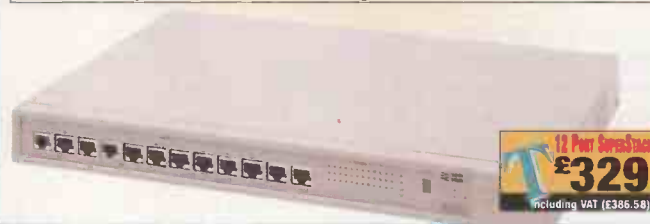
Media Choices. Create a single or mixed-media Ethernet stack with 12-port and 24-port RJ45 twisted-pair hubs, 6-port ST fiber hubs in the stack

Slide in SNMP management. with RMON. A choice of user-installable management modules provides for all the hubs in the stack

Transcend® management. A choice of either Workgroup or Enterprise Management is available

Manufacturer's lifetime warranty

Code	Description	Price	Inc VAT
DEH1961	SuperStack II 12 Port 10Base-T Hub	£329	£386.58
DEH1963	SuperStack II 24 Port 10Base-T Hub	£589	£692.08
DEH1954	SuperStack II Port Switch Hub 12 Port	£649	762.58
DEH1973	SuperStack II Port Switch Hub 24 Port	£949	1115.08
DEH2020	SuperStack II Management Module	£289	339.58
DEH1974	SuperStack II UPS System	£799	938.83
DEH1960	SuperStack II 6 Port Fiber Hub	£999	1173.83
DEH1976	SuperStack II 100 TX Hub 12 Port	£1269	1491.08
DEH1956	SuperStack II 100 T4 Hub 12 Port	£1299	1526.33
DEH1975	SuperStack II Hub 100 Management Module	£999	1173.83



Intel EtherExpress Pro/100 Adapters

Prepare for migration to Fast Ethernet with these high performance 10/100 PCI Cards. Features such as One step installation, Full Duplex capability and auto-negotiation for higher throughput and lower CPU utilization have made these cards the leader in fast ethernet.



Code	Description	Price	Inc VAT
DEC1766	EtherExpress Pro/100 B PCI	£79.95	£93.94
DEC2409	EtherExpress Pro/100 B PCI (6 Pack)*	£345.00	£406.24
DEC1735	Fast Ethernet Workgroup Pack, includes Express 12 port Hub and 10 x Pro/100b PCI cards	£1,339	£1573.33

Allied Telesyn Transceivers



This broad family of market-leading transceivers includes 10Base-T, BNC, and Fibre Optic



Code	Description	Price	Inc VAT
ATMX105	Slimline Transceiver AUI-BNC	£17.95	£21.09
AT210T5	Slimline Transceiver AUI-RJ45	£17.95	£21.09
ATMX10	Micro Transceiver AUI-BNC	£18.95	£22.27
AT210T	Micro Transceiver AUI-RJ45	£18.95	£22.27
ATMX26F	Micro Transceiver AUI-Fibre ST	£94.95	£111.57
ATMH70	Mac Transceiver AAUI-BNC	£24.95	£29.32
ATMH60T	Mac Transceiver AAUI-RJ45	£24.95	£29.32
ATMH80F	Mac Transceiver AAUI-Fibre ST	£129.95	£152.69

ME3000III PCMCIA Ethernet

- ✓ PCMCIA Type II
- ✓ Socket services support
- ✓ Auto Polarity detection
- ✓ BNC and TP supported
- ✓ Lightweight - ultra size
- ✓ Low power, no battery required



EURNT0456 £75 (E88.13)

GE2000III Advanced Ethernet Card

- ✓ NE2000 compatible
- ✓ PnP, Jumperless and Jumper modes
- ✓ BNC and TP connections
- ✓ Drivers included



EURNT0785 £20 (E23.50)

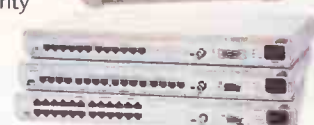
EURBN3609

5 PACK £94.95 (E111.57)



Allied Telesyn Workgroup Hubs

- ✓ An unrivalled range of flexible, reliable hubs
- ✓ Packet regeneration, automatic polarity detection/correction and link test capabilities
- ✓ Segment partitioning and jabber lock-up protection
- ✓ Status and diagnostic LEDs
- ✓ One year warranty.



Code	Description	Price	Inc VAT
DEH2051	4 Port 10Base-T Mini Hub (External PSU)	£39.95	£42.29
DEH2050	8 10Base-T Mini Hub (External PSU)	£45.95	£54.04
DER10041N	4 Port 10Base-T Hub 1AUI (Int PSU)	£89.95	£105.69
DEH1488	8 Port 10Base-T Micro Hub 1AUI, 1BNC (Int PSU)	£94.95	£111.57
DEH1485	12 Port 10Base-T Hub 1AUI, 1BNC (Int PSU)	£159.95	£187.94
DEH1486	16 Port 10Base-T Hub 1AUI, 1BNC (Int PSU)	£189.95	£223.19
DEH1487	24 Port 10Base-T Hub 1AUI, 1BNC (Int PSU)	£279.95	£328.94

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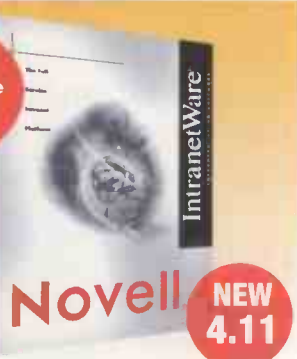


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This latest version of NetWare 4.11 Plus these free Intranet Services

- ✓ Novell's Netware Web Server 2.5
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- ✓ Novell's IPX/IP Gateway
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Novell NEW 4.11

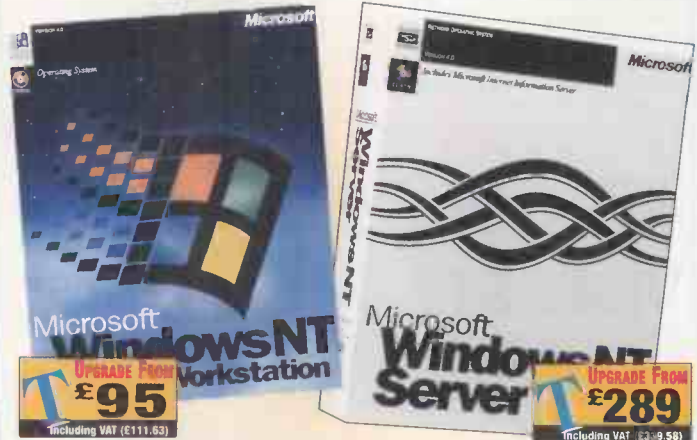
5 USER INTRANETWARE £459
Including VAT (£539.33)

IntranetWare Description	Order No.	Price	Inc. VAT
5-User	DCS3217	£459	(£539.33)
10-User	DCS3219	£899	(£1056.33)
25-User	DCS3220	£1599	(£1878.88)
50-User	DCS3221	£2139	(£2513.33)
100-User	DCS3222	£2999	(£3523.83)
250-User	DCS3223	£5299	(£6226.33)

IntranetWare User Upgrades From	To	CD Rom	Price	Inc VAT
10-User any ver.	IntranetWare 25 User	DCS3386	£929	£1091.38
25-User any ver.	IntranetWare 50 User	DCS3387	£1189	£1397.08
25-User any ver.	IntranetWare 100 User	DCS3388	£1699	£1996.33
100-User any ver.	IntranetWare 250 User	DCS3389	£3529	£4146.58

IntranetWare Upgrades & Netware 4.11 No. User	NetWare 4.11	Like-for-Like from 2, 3, & 4x	Upgrades from 4x	Additive Licencing
5	DCS3245 £459 (£539.33)	DCS3226 £229 (£269.08)	DCS3234 £179 (£210.33)	N/A
10	DCS3246 £899 (£1056.33)	DCS3227 £439 (£515.83)	DCS3235 £269 (£316.83)	DCS3242 £579 (£680.33)
25	DCS3247 £1,599 (£1878.83)	DCS3228 £679 (£797.83)	DCS3236 £319 (£374.83)	DCS3243 £1,299 (£1526.33)
50	DCS3248 £2,139 (£2513.33)	DCS3229 £859 (£1009.33)	DCS3237 £449 (£527.58)	DCS3244 £1,899 (£2231.33)
100	DCS3249 £2,999 (£3523.83)	DCS3230 £1,259 (£1479.33)	DCS3238 £629 (£739.08)	N/A

Microsoft Windows NT Server V4.0



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Including VAT (£349.58)

- ✓ Enhanced file and print services
- ✓ Comprehensive support for mission critical applications
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DCS2947	MS Windows NT Server v4.0+5 users Upg CD	£289	(£339.58)
DCS2944	MS Windows NT Server v4.0+5 users CD	£545	(£640.38)
DCS2945	MS Windows NT Server v4.0 +10 users CD	£769	(£903.58)
DCS3119	MS Windows NT Server v4.0 Client Licence 1 MLP	£35	(£41.13)
DCS3120	MS Windows NT Server v4.0 Client Licence 20 MLP	£479	(£562.83)

Microsoft Windows NT Workstation V4.0

DCS2943	MS Windows NT Workstation v4.0 Upg CD	£99.95	(£117.45)
DCS2949	MS Windows NT Workstation v4.0 CD	£219.95	(£258.44)
DCS3127	MS Windows NT Workstation v4.0 Upg 1 MLP	£95	(£111.63)
DCS3126	MS Windows NT Workstation v4.0 1 MLP	£195	(£229.133)

HP JetDirect Print Servers

- ✓ 3 high-speed HP Bi-Tronics ports, IEEE 1284 compliant
- ✓ Full NDS Compliance
- ✓ Throughput up to 230KBps

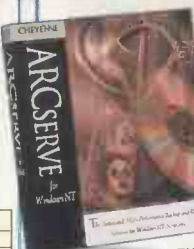


HEWLETT PACKARD

Code	Description	Price	Inc VAT
DEP1113	J2550A JetDirect 12345 Ethernet Card	£209	£245.58
DEP1114	J2552B JetDirect Card RJ45/BNC Ethernet, Appletalk	£249	£292.58
DEP1115	J2555B JetDirect Card RJ45 Token Ring	£349	£375.18
DEP1126	J2594A JetDirect EX Token Ring DB9	£329	£386.58
DEP1152	J2593A JetDirect EX Plus 3 RJ45/BNC Ethernet	£289	£339.58

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EURNT0305	Arcserve V4 20/25 User Dos Edition	£520	(£611.00)
EURNT0306	Arcserve V4 50 User Dos Edition	£630	(£740.25)
EURNT0310	Arcserve V5 20/25 User Win Edition	£575	(£675.63)
EURNT0311	Arcserve V5 50 User Win Edition	£699	(£821.33)
EURUP1967	Arcserve V6 Ent Ed Upg From V4, V5 50 User CD	£299	(£351.33)
EURNT0736	Arcserve V6 For Netware Enterprise Edition CD	£795	(£934.13)
EURNT0737	Arcserve V6 For Netware Workgroup Edition CD	£339	(£398.33)
EURNT0314	Arcserve For Windows NT Single Serve Ed V2.01 CD	£330	(£387.75)

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Get all the features of the Psion Dacom classic range plus Ethernet

- ✓ Supports most common operating systems
- ✓ Supports up to 33.6kbps
- ✓ Provides multifunctionality to suit your requirements
- ✓ LAN Connectivity
- ✓ High speed fax and modem
- ✓ LAN Connectivity
- ✓ GSM Data and fax communication
- ✓ All in one card
- ✓ GSM model now supports Nokia



Code	Description	Price	Inc VAT
MM3963	GoldCard V34 + Fax Ethernet	£259	£304.33
MM3964	GoldCard V34 + Fax GSM Ethernet	£299	£351.33
MM3962	GoldCard Ethernet	£95	£111.63

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- ✓ 2 Years on-site warranty with free next day swap-out programme
- SmartUPS only:
- ✓ SmartSlot for SNMP Management
- ✓ Intelligent Battery Management
- ✓ Shutdown Software included supports all major network operating systems

Description	Price	Inc VAT
Back-UPS 250	£76.95	(£92.83)
Back-UPS 400	£109	(£128.08)
Back-UPS 600	£139	(£163.33)
Smart-UPS 700 INET*	£269	(£316.08)
Smart-UPS 1000 INET*	£409	(£480.58)

*Includes Powerchute software for NT, Novell, OS2 and SCO Networks



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Vista S6E

Fast affordable colour scanner

Features:

- ✓ 24-bit single pass Colour
- ✓ 300x600dpi (4800 dpi through enhanced ultra view Technology)
- ✓ 23.6 seconds to scan A4 size image at 300dpi
- ✓ Scanning area 8.5" x 11.7"

IN5959 Vista S6E £199 (£233.83)
IN5958 Vista S6E Photoshop LE £229 (£269.08)
EURAC3067 Transparency Adapter £375 (£440.63)

UMAX



Vista S12

Features:

- ✓ Fast single pass colour scanner
- ✓ 600x1200dpi (9600x9600 software interpolated)
- ✓ 24-Bit colour
- ✓ Built in analog gamma correction

IN5962 Vista S12 with Photoshop LE £399 (£468.83)
IN5963 Vista S12 with Full Photoshop v4.0 £519 (£609.83)
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PowerLook 2000

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- ✓ 1000x2000dpi
- ✓ Scanning area 203x254mm
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- ✓ Includes Photoshop Full Version
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EURIN1522 PowerLook II Pro £1499 (£1761.33)
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Microtek Phantom 4800

The ideal low-cost solution for small businesses and home offices!

Features:

- ✓ 4800dpi (software interpolated)
- ✓ Optical resolution of 300x 600dpi
- ✓ Single pass scanning
- ✓ Includes SCSI controller card
- ✓ 24 bit colour
- ✓ Read-Iris OCR software and Image-in Easy Pack

ONLY £169
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Includes SCSI Controller

IN5973 Microtek Phantom 4800 £169 (£198.58)



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ScanJet 5P

Features:

- ✓ Automated scanning
- ✓ Optical Resolution of 300dpi
- ✓ Interpolated resolution of 1200 dpi
- ✓ 24-bit colour (16.7 Million colours)
- ✓ Plug and Play SCSI for Windows and SCSI Card

Includes the following software

- ✓ Corel PHOTO-PAINT Select for Windows
- ✓ PaperPort for HP
- ✓ Caere OCR
- ✓ HP PictureScan with HP AccuPage technology

NEW!
Scans at the push of a button

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Including VAT (£270.19)



PR12095 ScanJet 5P £229.95 (£270.19)

ScanJet 4C

- ✓ Resolution up to 2400dpi
- ✓ 30-Bit colour

- ✓ Improved integration with other office apps.
- ✓ Includes SCSI Controller Card
- ✓ Easy to use scanning software including Corel PHOTO-PAINT Visioneer PaperPort and

EURIN1334 £545 (£640.38)
IN5921

Scanjet 4C

Scanjet 4C

FROM £545
Including VAT (£640.38)



ScanJet 4Si

Mainstream PC scanner technology has traditionally concentrated on the single user, personal desktop flat-bed. Now, HP refocus the perception of scanners within medium/large organisations by providing an easy to use, fast, intelligent network scanner.

- ✓ Fast monochrome scanner; 15ppm, 300dpi up to 1200dpi, 256 gray-scales
- ✓ Auto OCR & file compression capability
- ✓ High reliability 50 sheet ADF built-in
- ✓ Direct network connection & 20 user licence for bundled software

EURIN1336 Ethernet model £1545 (£1815.38)
EURIN1549 Token Ring model £1765 (£2073.88)

FROM £1545
Including VAT (£1815.38)

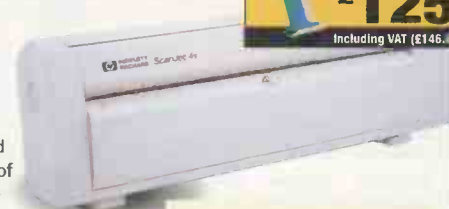


ScanJet 4s Scanner

- ✓ Easiest way to capture, share and file paper electronically
- ✓ Very compact yet capable of scanning A4 pages
- ✓ Plugs into any available serial port for immediate scanning

- with no need to install a card
- ✓ Transform scanned documents into editable text using OCR software
- ✓ Use Auto-Launch to easily move documents into over 60 different applications
- ✓ 400dpi enhanced and an optical resolution of 200dpi for clear easy-to-read documents.

ONLY £125
Including VAT (£146.88)



EURIN1337 £125 (£146.88)

VAT @ 17.5% inclusive prices shown in brackets. Carriage charges: see page 24 for details. All prices & specifications subject to change without notice. Our standard terms and conditions of sale apply to all sales (available on request). Returned goods may be liable to a restocking charge. E&OE. You may receive direct mail promotions from other companies unless you advise us by writing to Sales Administration Dept at the address above.

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ITEM	MODEL	PROCESSOR	HDD	RAM	SCREEN	PRICE	INC VAT
CP3759	ASCENTIA J20	5/100	810MB	8MB	11.3" STN	£1019	£1291.33
EURCP3227	ASCENTIA J30	5/100	810MB	8MB	10.4" TFT	£1619	£1902.33
CP3864	ASCENTIA J40	5/120	1GB	16MB	11.3" STN	£1359	£1596.83
EURCP3228	ASCENTIA J50	5/133	1GB	8MB	10.4" TFT	£1869	£2196.08
CP3757	ASCENTIA P41	5/120	1GB 6XCD	16MB	11.3" TFT	£2209	£2595.58
CP3756	ASCENTIA P41	5/120	2GB 6XCD	16MB	11.3" TFT	£2379	£2795.33
CP3803	ASCENTIA A41	5/120	1GB 6XCD	16MB	11.3" STN	£1445	£1697.88
CP3802	ASCENTIA A42	5/120	1GB 6XCD	16MB	12.1" STN	£1785	£2097.38

Toshiba



ITEM	MODEL	PROCESSOR	HDD	RAM/MAX	SCREEN	PRICE	INC VAT
EURCP3581	110CS	5/100	810MB	8/40MB	11.3" STN	£1015	£1192.63
EURCP3580	110CT	5/100	810MB	8/40MB	11.3" TFT	£1355	£1592.13
CP3893	200CDS	5/100	810MB	8/40MB	11.3" STN	£1269	£1491.08
CP3899	200CDT	5/100	810MB	8/40MB	11.3" TFT	£1779	£2090.33
CP3898	430CDS	5/120	1.35GB	16/40MB	11.3" STN	£1695	£1991.63
CP3897	430CDT	5/120	1.35GB	16/40MB	11.3" TFT	£2289	£2689.58
EURCP3577	500CS	5/120	1.35GB	16/80MB	12.1" STN	£1949	£2290.08
EURCP3332	500CDT	5/120	1.35GB	16/80MB	12.1" TFT	£2545	£2990.38
CP3896	500CS	5/133	1.35GB	16/80MB	12.1" STN	£2289	£2689.58
CP3895	510CDT	5/133	2.1GB	16/80MB	12.1" TFT	£3055	£3589.83
EURCP3576	650CT	5/133	1.35GB	16/80MB	11.3" TFT	£2799	£3288.63
CP3894	660CDT	5/150	1.44MB	16/80MB	11.3" TFT	£3395	£3989.13
CP3687	730CDT	5/150	2.1GB	16/144MB	12.1" TFT	£3819	£4487.33
CP4118	730XCDT	5/150MMX	2.1GB	16/144MB	12.1" TFT	£3989	£4686.08
CP4120	740CDT	5/166MMX	2.1GB	16/144MB	13.3" TFT	£4245	£4987.88

IBM



ITEM	MODEL	PROCESSOR	HDD	RAM/MAX	SCREEN	PRICE	INC VAT
CP4199	356X 2X9	5/133	1.08GBG	8/40MB	11.3" STN	£1569	£1843.58
CP4198	365XD 1X9	5/133	1.35GB	8/40MB	11.3" TFT	£2789	£3277.08
CP4197	580 T95	5/133	1.08GB	8/72MB	12.1" TFT	£2965	£3483.88
CP4196	760EL WL2	5/120	810MB	8/104MB	11.3" STN	£2049	£2407.58
CP4195	760EL X6H	5/120	1.35MB	8/104MB	11.3" STN	£2145	£2520.38
CP4194	760EL WL4	5/133	1.08GB	16/104MB	12.1" TFT	£2955	£3472.13
CP4191	760ELX4K	5/133	2.1GB	32/104MB	12.1" TFT	£3619	£4252.33

Compaq



ITEM	MODEL	PROCESSOR	HDD	RAM/MAX	SCREEN	PRICE	INC VAT
CP3316	ARMADA 1120	5/100	810MB	8/24MB	10.4" STN	£1019	£1197.33
CP4059	ARMADA 1130	5/120	1.08GB	16/48MB	10.4" STN	£1189	£1397.08
CP4060	ARMADA 1130CT	5/120	1.08GB	16/48MB	10.4" TFT	£1445	£1697.88
CP3319	ARMADA 4110	5/100	810MB	8/40MB	11.3" STN	£1275	£1498.13
CP3457	ARMADA 4120	5/120	1.08MB	16/48MB	11.3" STN	£1909	£2243.08
CP3317	ARMADA 4130T	5/133	1.08GB	16/48MB	11.8" TFT	£2889	£3394.58

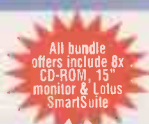
DESKTOP CPU'S

Compaq



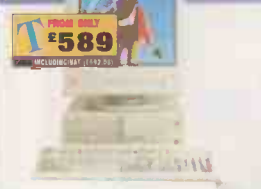
ITEM	MODEL	PROCESSOR	HDD	RAM	PRICE	INC VAT
CP3350	DESKPRO 2000	5/133	1GB	16MB	£756	£888.30
CP3349	DESKPRO 2000	5/133	1.6GB	16MB	£845	992.88
CP3419	DESKPRO 2000	5/166	1.6GB	16MB	£979	£1150.33
CP3347	DESKPRO 2000	5/180	1GB 8X CD	16MB	£1355	£1592.13
CP3346	DESKPRO 2000	5/200	1.6GB 8X CD	16MB	£1625	£1909.38
CP3342	DESKPRO 4000	5/120	1GB	16MB	£865	£1016.38
CP3340	DESKPRO 4000	5/133	1.6GB	16MB	£1095	£1286.63
CP3417	DESKPRO 4000	5/166	2.5GB	16MB	£1415	£1662.63
CP3337	DESKPRO 4000	5/180	1.6GB 8X CD	32MB	£1719	£2019.83
CP3420	DESKPRO 4000	5/200	2.5GB 8X CD	32MB	£2039	£2395.83
CP3334	DESKPRO 6000	5/166	1GB 8X CD	16MB	£1709	£2008.08
CP3423	DESKPRO 6000	5/200	2.1GB 8X CD	32MB	£2335	£2743.63
CP3422	DESKPRO 6000	5/200	5.2GB 8X CD	32MB	£3119	£3664.83

AST



ITEM	MODEL	PROCESSOR	HDD	RAM	PRICE	INC VAT
EURCP3231	BRAVO LC	5/133	1.2GB	16MB	£725	£851.88
EURCP3232	BRAVO LC	5/166	1.2GB	16MB	£895	£1051.63
CP4141	BRAVO LC BUNDLE	P/133	16MB	1.2GB + 15" MONITOR	£1009	£1185.58
CP4140	BRAVO LC BUNDLE	P/166	16MB	1.2GB + 15" MONITOR	£1165	£1348.88
CP4157	BRAVO MS BUNDLE	P/166	16MB	1.2GB + 15" MONITOR	£1309	£1538.08

IBM



ITEM	MODEL	PROCESSOR	HDD	RAM	PRICE	INC VAT
CP4211	PC 340	5/100	850MB	8MB	£589	£680.33
CP4206	PC 340	5/100	1.2GB	8MB	£675	£793.13
CP4205	PC 340	5/120	1.2GB	16MB	£725	£851.88
CP4202	PC 340	5/133	850MB	8MB	£695	£816.63
CP4201	PC 340	5/166	2.5GB	16MB	£1155	£1357.13
CP4214	PC 350	5/120	1.2GB	16MB	£869	£1021.08
CP4207	PC 350	5/133	2.5GB	16MB	£1095	£1286.63
CP4210	PC 350	5/166	1.6GB	16MB	£1235	£1451.13
CP4213	PC350	5/200	1.6GB	32MB	£1525	£1791.88

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MT0816 21" XP21 Multisync	£1,545.00	£1,815.38

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EUREX2479 Stealth 64 Video 2121XL PCI 1MB DRAM	£126.00	£148.05
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EX7428 Righteous 3D PCI 64BIT 4MB EDO-DRAM	£179.00	£210.33

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EUREX1170 WinBoost PCI 1MB DRAM	£83.00	£97.53
EUREX1173 WinBoost PLUS PCI 2MB DRAM	£117.00	£137.48
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EUREX1164 WinTurbo PCI 2MB	£182.00	£213.85
EUREX1163 WinTurbo VLB 2MB	£182.00	£213.85

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EX7200 Grafistar 400 PCI 64BIT 2MB EDO-DRAM	£49.00	£57.58
EUREX2872 Grafistar 600 PCI 128BIT 2MB DRAM	£85.00	£99.88
EUREX2829 Grafistar 700 PCI 64BIT 2MB VRAM	£195.00	£229.13
EX7271 Grafistar 700 PCI 64BIT 4MB	£359.00	£421.83
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DRS805	4X Write 6X Read Ext	£679.00	£797.83
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DRS371	4X Mastering System Mac	£1,895.00	£2,226.63
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DRS857	PowerUser 10X IDE	£75.00	£88.13

Code	Description	Price	Inc VAT
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DRS631	Toshiba 8X IDE	£69.00	£81.08
DRS853	Toshiba 12X SCSI	£135.00	£158.63
DRS856	Toshiba 12X IDE	£105.00	£123.38

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DRS901	4/8GB EXTERNAL DAT Parallel & SCSI	£935.00	£1098.63
DRS899	4/8GB EXTERNAL TR-4 Parallel & SCSI	£535.00	£628.63

Code	Description	Price	Inc VAT
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DRS205	BACKPACK 8000T TR-4 External Parallel	£425.00	£499.38
EURDR1349	BACKPACK 800TD 800MB TR-1 External	£99.00	£116.33

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EURDR0904	SURESTORE 6000i 8GB Internal	£645.00	£757.88
EURDR0905	SURESTORE 12000e 48GB External	£1,799.00	£2,113.83
DRS792	SURESTORE T4i TR-4 4/8GB DRIVE Internal	£289.00	£339.58
DRS720	DLT drive 15/30GB	£2,785.00	£3,272.38
DRS721	DLT drive 20/40GB	£3,675.00	£4,318.13

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DRS402	Ditto 2GB Internal	£85.00	£99.88
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DRS477	8GB TR-4 Falcon Internal IDE	£289.00	£339.58
DRS481	8GB TR-4 Falcon Internal SCSI	£295.00	£346.63

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DR4602	Zip Drive 100MB Parallel External	£109.00	£128.08
EURDR0847	Zip Drive 100MB SCSI External	£109.00	£128.08
EURDR4672	Zip Drive 100MB SCSI Internal	£109.00	£128.08
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EURDR4560	Jaz External SCSI Drive	£319.00	£374.83
EURDR4559	Jaz Internal SCSI Drive	£265.00	£311.38
EURME1268	Disk 1GB 3.5" FOR Jaz Drive	£69.00	£81.08
EURBN3607	Jaz Drive External SCSI with 5 cartridges	£585.00	£687.38
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EX3976	MiniSCSI EPP APA358	£115.00	£135.13
EUREX2748	PCI KIT AHA2920	£95.00	£111.63
EUREX2476	PCI MultiChannel PCI Kit AHA3940UJ	£259.00	£304.33
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EX7122	SCSI Direction ISA Card AHA1522B	£95.00	£111.63
EUREX0633	SCSI Master ISA Kit AHA1542CP	£155.00	£182.13
EUREX0631	TotalCD ISA Card AVA1505	£34.00	£39.95
EX6243	TotalConnect ISA Card AVA1515	£55.00	£64.63
EUREX0625	VL SCSI Master VLB Kit AHA2842A	£149.00	£175.08

Code	Description	Price	Inc VAT
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EPSON			
EURIN1228	GTX-8500PCP Parallel	£402.95	£473.47
EURIN1230	GTX-8500PCS SCSI	£430.95	£506.37
EURIN1229	GTI-8500PCS SCSI	£509.95	£599.19
INS924	GTX-9500PCP Parallel	£520.95	£612.12
INS928	GTX-9500PCS SCSI	£548.95	£645.02
IN6044	GTI-9500PCS SCSI	£625.95	£735.49

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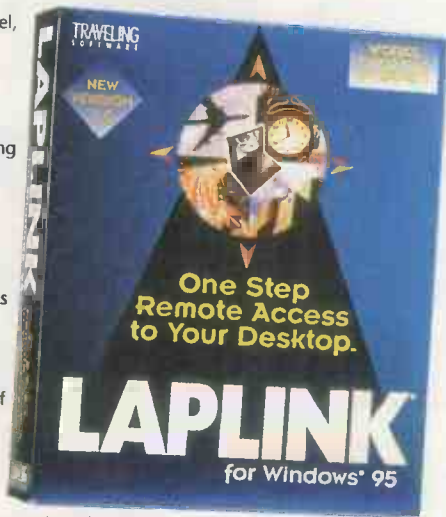
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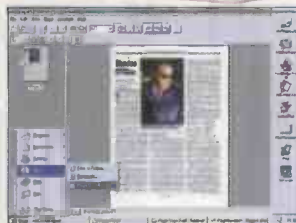
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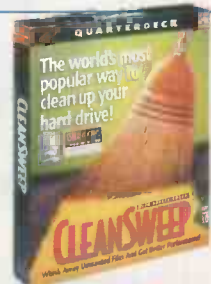
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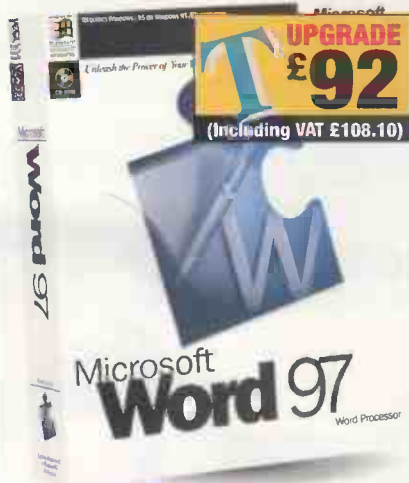
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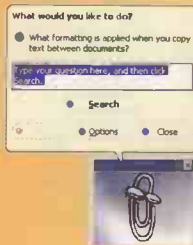
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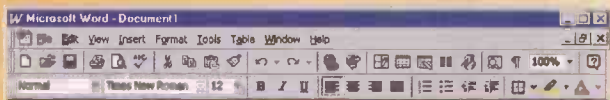
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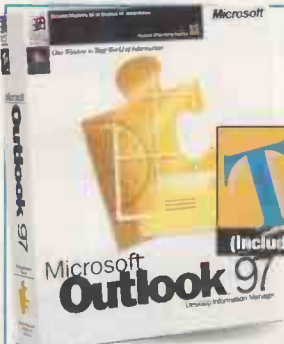
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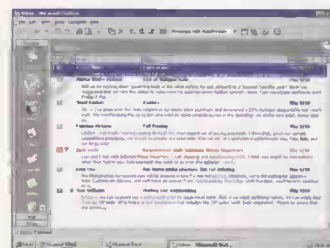
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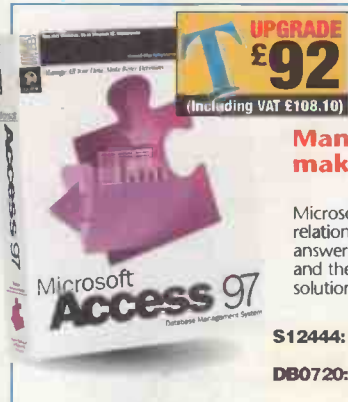
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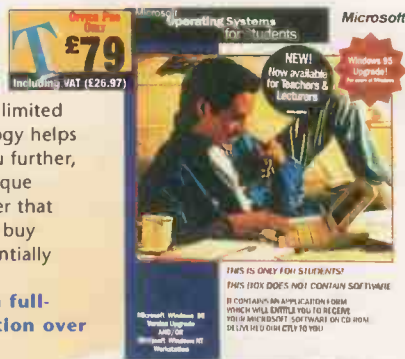
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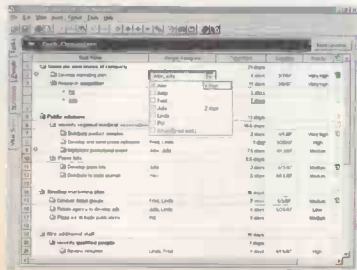
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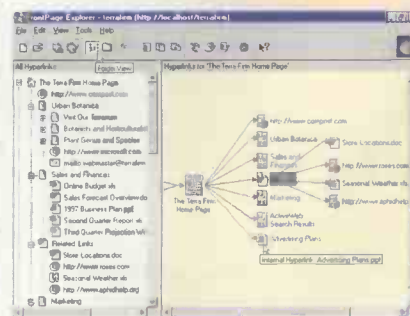


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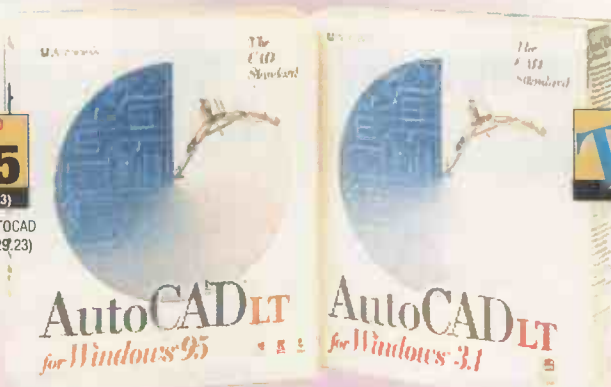
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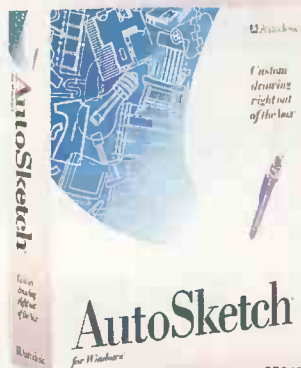
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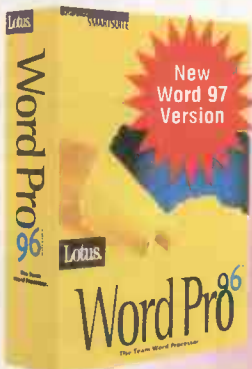
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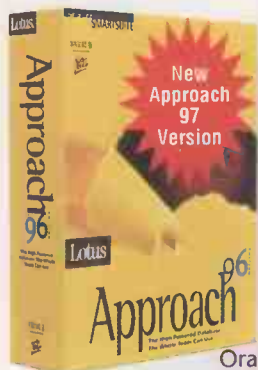
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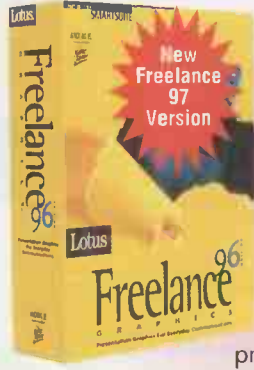
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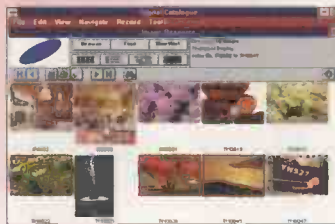
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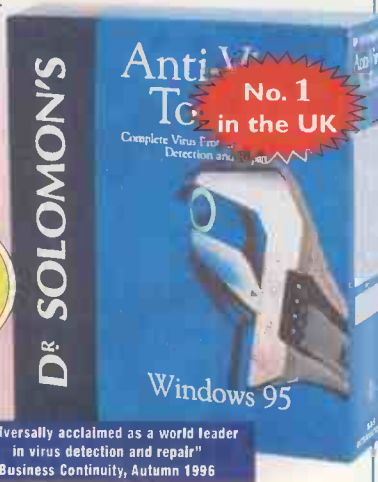
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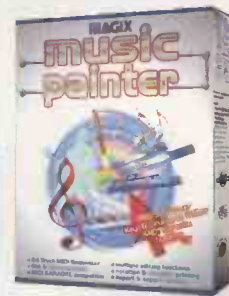
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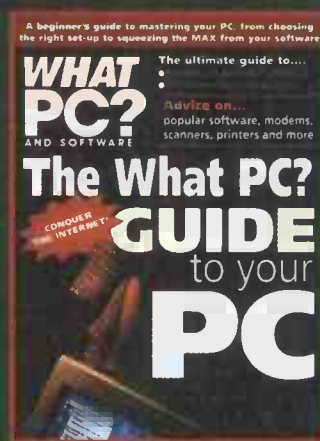
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BK1175	MS Visual Basic 5 Deluxe Learning Edition CD + Book	£121.98
BK0573	MS Windows 95 Training CD + Book	£187.99

Carriage Charges (These apply to maintenance)

	Each 1st item	Each Additional
Single item up to 30kg	£8 (£9.40)	£6 (£7.05)
Large Laser Printers (4V4S/colour)	£24 (£28.20)	£24 (£28.20)
Large Monitors (17" + above) Servers	£24 (£28.20)	£24 (£28.20)
	Each 1st item	Each Additional
Plotters	£35 (£41.13)	£35 (£41.13)
Small accessory	£5 (£5.88)	£2 (£2.35)
Small Software package	£5 (£5.88)	£2 (£2.35)

The carriage charges would be based on the heaviest item being taken as the first item. Additional items will be charged at the rate shown for the category. Minimum charge of £5 will apply in all cases. For orders with a large number of items, or for overseas rates, please ask for a quotation.

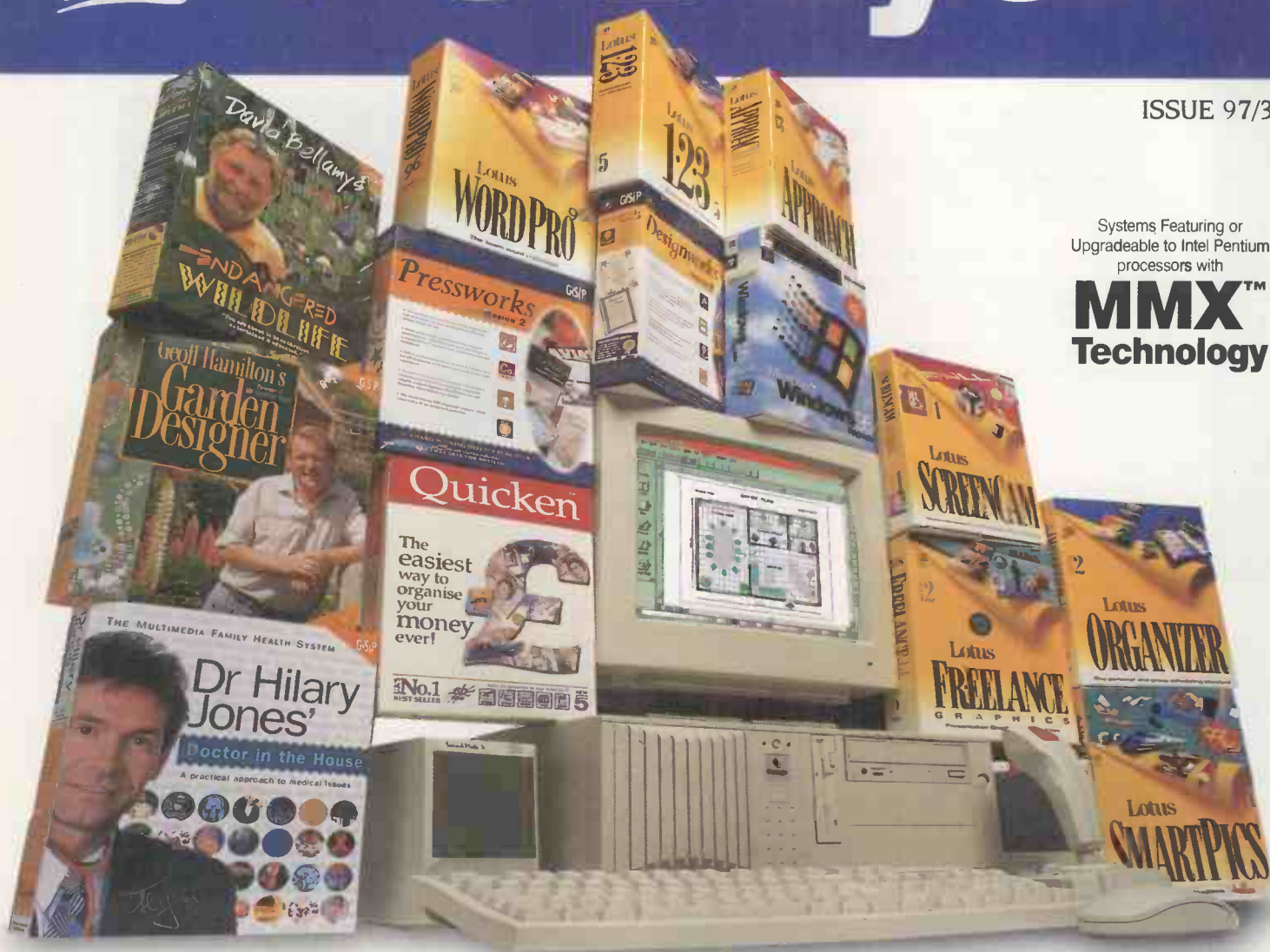


PC Buyer

ISSUE 97/3

Systems Featuring or Upgradeable to Intel Pentium processors with

MMX™ Technology



Two Unbeatable Deals From Time Computers

P166

P166MMX Powerstation DT-1M

- Intel P166MMX Processor
- Pentium 200MMX Upgradeable
- 16Mb EDO RAM
- 1.2Gb Hard Disk
- Full Eight Speed Multimedia
- 14" 0.28dp Screen
- 14.4 Modem
- Pre-loaded & CD Software
- Full Details Inside

Product Code: 380-30-580

£ **1138**^{.58} inc. VAT

£ **969** +VAT

P166+

P166+ Powerstation DT-2

- IBM 6x86 P166+ Processor
- Pentium 200MMX Upgradeable
- 32Mb EDO RAM
- 2.1Gb Hard Disk
- Full Eight Speed Multimedia
- 15" 0.28dp Screen
- 33.6 Modem
- Pre-loaded & CD Software
- Full Details Inside

Product Code: 380-30-301

£ **1150**^{.33} inc. VAT

£ **979** +VAT

All offers must end 31st March



The UKs Best Deals!

Time Services

Established over ten years as a standard-setter in the computer market, Time Computers has always been the first choice of customers who demand quality products at competitive prices with reliable service and back-up.

As well as achieving soaring sales and rapid growth to become the UK's leading direct PC supplier, we have also established an excellent reputation for our professional approach to supplying quality computer solutions to small businesses, and home users. We have the resources, know how, and financial strength to keep us ahead with all the latest advances in computer technology and to respond quickly to market trends and the needs of our customers.

We were the first company to offer complete bundled solutions at affordable prices, the first to offer interest free credit in the direct PC market and the first to develop the direct retail showroom concept.

To ensure the quality of our products and to provide you with the latest technology, we have forged strong working relationships with the giants of the industry. Our direct relationships with the world's leading hardware and software manufacturers, coupled with the strength of our volume buying and our efficient centralised operation with its low overheads, also means that we are able to offer the keenest prices on the very latest products. We continue to invest in our customer and support services and



Time Computers HQ site is situated in the Ribbles Valley near the M65 & M66 motorway network.

the HQ site now employ's over 600 trained staff, all committed to providing the best quality solutions and service possible. We believe our success is a direct result of our commitment to listening to our customers needs, and most important of all, delivering those needs promptly.

Pre-Sales Advice

Our knowledgeable sales staff are fully trained with what is available in the PC industry and are happy to give you free advice on the most suitable make and model for your requirements.

Customer Service

Customer Services staff liaise closely with your sales contact, and will act as your representatives within the company to ensure that your queries are resolved. We have invested heavily in our personnel and operations, to ensure our customers receive the best service available from every department in the company. We always endeavour to achieve complete customer satisfaction.

Testing

Remember when you buy from Time Computers your system will be fully tested so that you can start using it immediately. On many systems bundled software may be pre-installed thus saving you many hours of time. All systems go through a number of quality checks to ensure your PC arrives fully functional and ready for use.



Your representative within Time Computers, the Customer Services team

Hardware and Technical Support

One of the main advantages of dealing directly with Time Computers is the facility to seek help from trained PC experts. Our technical support staff will provide hotline support should your system ever malfunction, or if you wish to upgrade. First time PC buyers should note that today's PC systems are very powerful and versatile, but can take considerable time to master all the features and become familiar with the operating system and software.

Warranty

All goods carry twelve months return-to-base warranty, except where otherwise indicated. In addition, Time Cover offers a valuable extended three or five year warranty on PC systems, covering all parts, labour and carriage costs to ensure long term trouble-free-use. Please ask for details when placing your order.

Repair and Upgrade Facilities

We have fully equipped in-house facilities to repair the vast majority of products we sell. This means that you have fast turn around should your system ever go faulty. Our upgrade service will enable you to keep your system future-proof by installing new processors, RAM and larger storage devices.

Buy Direct or from Showrooms

There is no doubt that the customer gets better value in terms of price, specification and support when they buy PC systems from Time Computers. You not only have all the advantages of choosing to buy direct or from our showrooms, but also the advantages of having a wider range to select from and flexible payment terms including Buy Now, Pay Later deals.

Complete Solutions

Unlike other vendors, we are able to offer you a complete solution comprising of PC systems, software for all applications, printers and after sales support with extended warranty options. You can source all your PC requirements from one supplier and be confident that everything works without any problems. With Buy Now Pay Later options on some systems, you can afford a complete solution from day one.

Latest Technology

Our huge buying power, centralised resources with their low overheads and direct relationships with the world's leading PC manufacturers means that we are able to offer the latest specifications at very aggressive prices. When you buy from Time you get a lot more for your money. Compare our specifications, prices, and service with any other major company and you will quickly see why we are the UK's leading PC supplier.



One of Time Computer Systems Testing and Configuration areas

Credit Facilities

Interest free credit (APR 0%) is also available on some solutions and options (subject to status). All solutions advertised with interest free credit can also be paid for in full by credit card or cheque. If you wish to take out interest free credit, please let your sales contact know when placing your order. Systems which are not available on interest free credit may be purchased on credit at a competitive APR (Annual Percentage Rate) of 19.8% over a 24 month period, subject to status. Please ask for further details.

Video User Guide

We are the first company to provide each customer with a free video which includes a wide range of topics, such as setting up your PC, configuring Windows 95 and using your PC. The video also covers subjects such as how to install and use modems and printers and how to contact service and support staff.



Wide Range

We offer a wide selection of systems to give customers more choice. The following pages describe most of the products available. Please note this catalogue shows the current special offers only. These prices are substantially discounted from our retail price list. Many offers may look similar but the specification may be different, they may contain different software bundles and the prices will also differ. Please check carefully.

Please Note

Computer Screen Sizes

Confusion can arise because computer industry practice is to measure monitors using the CRT tube size, not visible tube. Thus the actual visible diagonal on any 14" computer screen may only be approximately 13".

VAT

As many of our customers are business buyers, our prices normally exclude VAT at 17.5%. However, there is movement in the PC industry towards VAT inclusive pricing and now we have shown dual pricing with inc. VAT and ex. VAT prices listed. All finance prices (shown as monthly payments) include UK mainland delivery and VAT.

Specifications and Pricing

The products listed in this advert are compiled three to four months before the publication cover date. Computer technology moves at a very fast pace and it is possible that prices and specifications may be out of date when you read these advertisements. A product may no longer be available if it is discontinued by the manufacturer or is in short supply. In such cases we would try to recommend, where possible, a product which usually offers equal or better price/performance ratio. We try to provide as much information as possible. However, this leaflet/advert does not form part of any sales contract. Please check the latest details directly with sales staff prior to ordering.

Pre-loaded Software

Most software these days is supplied either pre-loaded on the hard disk or on CDs with on-line documentation. We use pack shots for illustration purposes only to visually illustrate the software you get with your system. Any reference to the value of the software is based on individual RRP's minus the cost of media and manuals, not included with pre-loaded software.

Delivery

Delivery charge is not normally included in the price as it may vary with destination. Total Price shown includes VAT and UK mainland delivery. For simplicity of calculation all interest free credit prices do include UK mainland delivery. Normally UK mainland (excluding scottish highlands) insured courier delivery for PC Systems is £25 +VAT = £29.38 inc VAT. Please call for delivery details for other items ordered separately and for deliveries outside UK mainland. Goods are normally despatched within 7 to 14 days. All orders will be fulfilled within 28 days unless otherwise notified. Showroom prices will include the above delivery charge.



Limited Offers

All offers in this catalogue are limited by period or quantity of systems. Please check our latest national newspaper advertisements for the most up to date offers. Always check with the sales team prior to ordering. Once you have made a decision to purchase a particular system please place your order early to avoid disappointment.

01282 777 111 TIME

Sales lines open Mon - Fri 8.30am - 7pm, Sat 9am - 5pm Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No: 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability, and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Pack shots are shown for illustration only. E.&OE.

INTRO2A

How to Select a PC

Payment Option

Many systems shown are sold by immediate payment (credit card, cheque, bank transfer, draft, switch or cash). These "cash" systems can also be transferred to a credit option with a low APR of 19.8% over a period of usually two years. Some systems are sold on interest free credit. These systems usually have a higher specification with more software and are available with interest free credit, usually on buy now pay six months later terms. With these systems payment can also be made with order or finance taken over a longer period at APR 19.8%.

Processor

See charts opposite.

RAM

We strongly recommend 32Mb RAM when using Windows® 95. Most of our models now include 32Mb RAM as standard. A 32Mb P166+ system will cost less and out perform a 16Mb P200 MMX system when running real life applications. Speed of RAM makes very little difference. 32Mb RAM also allows smooth multi-tasking. High end systems may come fitted with 64Mb RAM.

Hard Disk

2.1Gb or 3.2Gb are the popular sizes. All disks used are enhanced IDE with on-board cache. Go for the largest capacity within your budget.

Modem

A modem is strongly recommended and can enhance the capabilities of the PC many times over. It can be used as a fax machine, to transfer programs and data, personal e-mail, link to on-line services and to the Internet. 14.4 is adequate for fax but slow for frequent Internet use. 28.8 speed is the most popular with the fastest being at 33.6 speed. Modems will be required even more in the future. Do not consider a PC without a modem.

Fast 64-bit graphics

64-bit Integrated graphics with video acceleration are incorporated into our latest advanced boards. These graphics use 1Mb of system RAM and are easily switchable to use 2Mb RAM to give more colours and higher resolutions at no additional cost. Some systems also feature ATI Ragell 3D advanced graphics cards with dedicated 4Mb SGRAM video memory. (The fastest cards we have ever tested.)

Multimedia Hardware

Over 90% of systems are purchased with multimedia which is now becoming essential for most applications. Eight speed are the most popular CD-ROM drives with the fastest being 12 speed. All multimedia systems also include a 16-bit quality sound and speaker system with some models featuring wave table sound and more powerful speakers. Most systems include a joystick with some also featuring a microphone.

Case Style

An expandable case with plenty of drive bays (at least five) is recommended. Most popular models are desktop or midi tower style.

Software MPEG

All our systems include the ability to playback MPEG-1 video CDs.

Screen

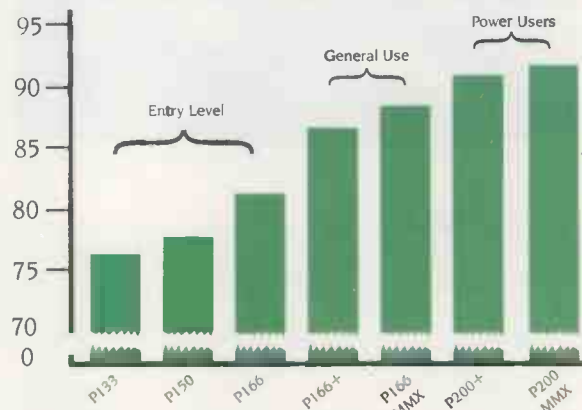
We would recommend a 14" NI .28dp screen as a minimum. Most of the high end systems come with a 15" or 17" .28dp NI screen. Please note that computer screens are normally measured using the CRT size. Actual viewing area may be approximately 1" less.

Software Bundle

Models are available bundled with different pre-loaded applications. Lotus Windows 95 software suite is the most popular and provides everything you are ever likely to need. Microsoft® Office is available as an optional extra with all systems. Various top quality CD multimedia titles are included with many systems. Most systems come with Windows 95 which is the most popular operating system. Note: All software is pre-loaded or supplied on CDs with on-line documentation.

Processors

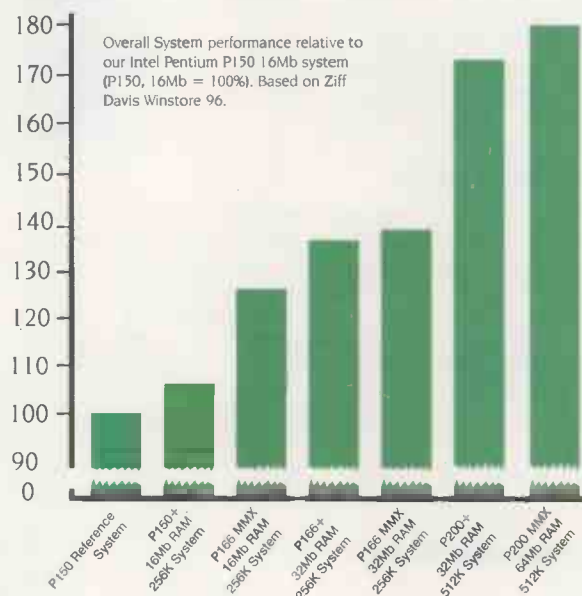
Models are available with Intel Pentium®, the higher performance IBM/Cyrix/ST 6x86 or the new Intel Pentium® MMX processors. Relative performance of the processors is shown by Ziff-Davis Winstone 96 benchmarks, measured in an otherwise identical system. All the systems featured include Intel socket 7 and are upgradeable to Intel 200MHz Pentium MMX processors. Pentium Pro systems are not recommended unless you are running Windows NT as these may be actually slower than Pentium systems when running typical Windows 95 programs.



Relative processor performance based on Ziff Davis Winstone 96™ as certified by MDR labs.

Overall System Performance

Overall system performance depends not just on processor alone, but also on the amount and speed of other components. The most important are size of RAM and external cache, as well as the speed of the graphics card and hard disk.



Processors with MMX™ Technology

Intel Pentium processors with MMX™ technology include extra internal cache to speed up all applications. They also include 57 additional instructions to speed up MMX specific software. All systems advertised in this catalogue either include or are easily upgradeable to Intel 200MHz Pentium processor with MMX™ technology, using our MMX upgrade services. Please call for details.

Buying Advice

If you need to use MMX enabled software right now, then it makes sense to purchase a system with an Intel Pentium MMX processor. If, however you plan to be using MMX software later, then it makes sense to buy a system based on an Intel Pentium Classic or IBM 6x86 processor that can be upgraded to a 200MHz MMX Pentium later if required. You will also find that such a system is better specified and actually delivers better overall performance than an MMX system of the same price. This is because the present higher cost of MMX processors means we have to use less RAM and smaller hard disks to reach a similar price point.

Order Direct or visit our Showrooms

Look through the offers and decide on the solutions which interest you most. Then call our sales team direct on 01282 777 111, or alternatively call into your nearest showroom, these are mainly located within Powerhouse Superstores, details of which are outlined below. Our knowledgeable staff will be on hand to provide you with further advice and clarify any points. You can place your order directly with our showroom sales assistant or with your sales contact over the phone, giving details of the system you require. Payment can be made using Access, Visa, Switch or American Express. You can also send your order by fax, or post, if more convenient, including a cheque for the full amount made payable to "Time Computer Systems Ltd" (please allow five working days for cheques to clear).

- Key:**
- Time Computer Systems Showrooms located within Powerhouse Superstores
 - Time Computer Systems Other Showrooms



Time Computer Systems Showrooms can be found in the following locations:

Aylesbury - Unit 2 Cambridge Close, Cambridge Retail Park, Aylesbury. Tel: 01296 436767

Banbury - 2 Lockheed Close, Banbury. Tel: 01295 279585

Basildon - Unit 6B, Mayflower Retail Park, Arterial Rd, Basildon. Tel: 01268 282526

Bracknell - Unit 5B, Skimpedhill Lane Retail Park, Bracknell. Tel: 01344 486353

Bristol - Unit 2, Black 6 Lysander Rd, Patchway, Cribbs Causeway, Bristol
Open from 28th February

Cambridge - The Bee Hive Centre, Coldhams Lane, Cambridge. Tel: 01223 360899

Chippenham - Unit 3B Hathaway Retail Park, Foundry Lane, Chippenham. Tel: 01249 461230

Cowley - Unit 3, Oxford Retail Park, Ambassador Ave, Cowley. Tel: 01865 395608

Crawley - Unit 2, County Oak Retail Park, Crawley. Tel: 01293 523265

Derby - Unit 2, The Kingsway Retail Park, Derby. Tel: 01332 349443

Gateshead - Unit 6, Cameron Walk, Metro Shopping Centre, Gateshead. Tel: 0191 461 0942

Guildford - Ladymead Retail Park, Guildford. Tel: 01483 562448

Hayes - Unit 4 Lombardy Retail Park, Cold Harbour Lane, Hayes. Tel: 0181 573 1531

Huntingdon - Unit B, Huntingdon Retail Park, St Peters Rd, Huntingdon. Tel: 01480 459392

Ipswich - Unit 3, Euro Retail Park, Ransomes Way, Ipswich.
Open from 7th March

Kettering - Unit 5, Kettering Retail Park, Carina Road, Kettering. Tel: 01536 519813

London - Unit 2, Humphrey St, Southwark, London. Tel: 0171 394 7315

Northampton - Riverside Retail Park, Northampton. Tel: 01604 415018

Norwich - Unit 1, Blackberry Court, Sweetbriar Rd, Norwich. Tel: 01603 484752

Poole - Unit 3, Manning Heath Retail Park, Poole. Tel: 01202 743138

Slough - Slough Retail Park, 300 Bath Rd, Slough. Tel: 01753 534636

Solihull - Unit 3, Sears Retail Park, Marshall Lake Rd, Solihull. Tel: 0121 733 1936

Southampton - Unit 4, Nursling Ind Park, Southampton. Tel: 01703 740693

Stevenage - Roaring Meg Retail Park, Monks Wood Way, Stevenage. Tel: 01438 741435

Stoke - Festival Park, Etruria, Stoke. Tel: 01782 297895

Swindon - Unit 4, Greenbridge Retail Park, Drakes Way, Swindon. Tel: 01793 434112

Watford - Unit 10, The Odham Centre, Asda Shopping Centre, Watford. Tel: 01923 247555

Worcester - Unit C, Elgar Retail Park, Blackpole, Worcester. Tel: 01905 757947

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Sales lines open Mon-Fri 8.30am-7pm, Sat 9am-5pm Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No: 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability, and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Pack shots are shown for illustration only. EOE.

THTS2A

Multimedia PowerStation Desktop

P150, P166MMX and P166+
desktop multimedia systems
at very keen prices.
(Payment with order only eg.
credit card / cheque).

Systems Featuring or
Upgradeable to Intel Pentium
processors with

MMX™
Technology



Infopedia UK
Encyclopedia



Compton's World
Atlas 1997



KeyCAD Pro



Bodyworks v5



Multipedia
Bookshelf



Project Manager
Pro



Read, Write and
Type



HomeWise

Our P166MMX desktop system sets a new performance standard for entry level PCs. It comes complete with Intel Pentium 166MHz processor with MMX™ technology, 16Mb fast EDO RAM, fax/data modem, full feature eight speed multimedia, fast 1.2Gb hard

disk and a superb range of high quality software. Our 'Best Buy' P166+ Omega desktop system (shown above) was the fastest PC tested by Personal Computer World and includes a massive 32Mb EDO RAM, large 2.1Gb hard disk, 15"

screen and 33.6 modem. It is upgradeable to P200MMX and actually delivers better overall performance than our P166MMX 16Mb system. At the new lower price of just £979 +VAT, this is the hottest PC deal in the industry.



P150

P150 PowerStation DT-1

- **P150 Processor** Intel Pentium® 150MHz processor
- **P200 MMX Upgradeable** Upgradeable to Intel 200MHz Pentium with MMX™ technology
- **16Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **14" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **4w Speakers** Stereo speakers
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200MMX
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
- **Standard Features** 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
- **Desktop Case** Colossus desktop with 7 drive bays for plenty of expansion
- **Full Support and Warranty** One year warranty extendable to three or five years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
- **CD Software Bundle** David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-550



P166

P166 MMX PowerStation DT-1M

- **P166 MMX Processor** Intel Pentium® 166MHz processor with MMX™ Technology
- **P200 MMX Upgradeable** Upgradeable to Intel 200MHz Pentium with MMX™ technology
- **16Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **1.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **14.4 Modem** Fast BABT approved fax/data/Internet modem
- **14" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **4w Speakers** Stereo speakers
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200MMX
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
- **Standard Features** 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
- **Desktop Case** Omega desktop with 7 drive bays for plenty of expansion
- **Full Support and Warranty** One year warranty extendable to three or five years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
- **CD Software Bundle** David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-580



P166+

P166+ PowerStation DT-2

- **P166+ Processor** 6x86 P166+ processor manufactured by IBM/Cyrix
- **P200 MMX Upgradeable** Upgradeable to Intel 200MHz Pentium with MMX™ technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb. Remember a 32Mb P166+ system gives better performance than a 16Mb P200 MMX system
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **4w Speakers** Stereo speakers
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses system 1Mb RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200MMX
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
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- **Full Support and Warranty** One year warranty extendable to three or five years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
- **CD Software Bundle** David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 380-30-301

£ **1056.33** inc. VAT
 £ **899** +VAT

£ **1138.58** inc. VAT
 £ **969** +VAT

£ **1150.33** inc. VAT
 £ **979** +VAT

All offers must end 31st March

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TIME

Sales lines open Mon-Fri 8.30am-7pm, Sat 9am-5pm

Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No: 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Rack shots are shown for illustration only. E&OE.

TMPD2A



Multimedia PowerStation Midi Tower

P166+, P166 MMX and P200+ midi tower multimedia systems at very keen prices. (Payment with order only eg. credit card/cheque).

Systems Featuring or Upgradeable to Intel Pentium processors with

MMX™
Technology



Infopedia UK
Encyclopaedia



Compton's World
Atlas 1997



KeyCAD Pro



Bodyworks v5



Multipedia
Bookshelf



Project Manager
Pro



Read, Write and
Type



Homewise

Take a look at the amazing specification of these high performance Colossus midi tower systems which are available for home and business users looking for top specification systems.

The most popular P200+ system (shown above) includes a superb ATI 3D graphics card featuring 3D accelerator chip and 4Mb synchronous SGRAM video memory. A Soundblaster 32 wave table advanced sound

card, massive 32Mb EDO RAM, 33.6 modem, 12 speed CD-ROM drive, superb 15" screen, 3.2Gb hard disk and high performance 6x86 P200+ processor are also included at an incredible £1299 +VAT.



P166+

P166+ PowerStation MT-3

- **P166+ Processor** 6x86 P166+ processor manufactured by IBM/Cyrix. Ziff Davis Winstone processor score 86.7 (MDR Labs)
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb. Remember a 32Mb P166+ system gives better performance than a 16Mb P200 MMX system
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BAPT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homeworks and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-551

£ **1173.83** inc. VAT
 £ **999** +VAT



P166

P166 MMX PowerStation MT-4

- **P166 Processor with MMX** Intel Pentium 166MHz with MMX technology. Ziff Davis Winstone processor score 89 approx
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BAPT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homeworks and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro
 - Includes Extra Software designed for MMX technology

Product Code: 001-30-552

£ **1350.08** inc. VAT
 £ **1149** +VAT



P200+

P200+ PowerStation MT-5

- **P200+ Processor** 6x86 P200+ processor manufactured by IBM/Cyrix. Ziff Davis Winstone processor score 91.6 (MDR Labs)
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **3.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BAPT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Twelve Speed CD-ROM drive** Fast twelve speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **32 Wave table Sound** Genuine Creative Labs Soundblaster 32 hardware wave table plug and play advanced stereo sound card
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **512k Cache** Fast pipeline burst mode type
- **64-bit 3D 4Mb Graphics** ATI Rage II 3D Graphics processor with 4Mb SGRAM dedicated video memory
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Triton II 430HX advanced chipset plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homeworks and Quicken v5
 - CD Software Bundle David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro and Project Manager Pro

Product Code: 001-30-553

£ **1526.33** inc. VAT
 £ **1299** +VAT

All offers must end 31st March

01282 777 111

TIME

Sales lines open Mon - Fri 8.30am - 7pm, Sat 9am - 5pm

Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No: 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability, and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Pack shots are shown for illustration only. E&OE.

TMPM2A

Multimedia WinStation Desktop

APR **0%***

Interest Free Credit See payment option 2

High specification desktop multimedia system with additional software available with three payment options including Interest Free Credit.

3 Ways to Pay

Example P166+ WinStation DT-B

1) Pay with order:

Pay the whole amount by credit card / cheque. Total Price £1079 plus £25 delivery and VAT = £1297.20 inc VAT and delivery

2) 6 Months Interest Free Credit: *

Pay just £129.72 (10%) deposit and then nothing for six months, then pay the rest (£1167.48) Total Price = Cash Price. Interest Free Credit. APR 0%

APR **0%**

3) 2.5 Years Credit:

Pay just £129.72 (10%) deposit and then nothing for six months, after six months pay £58.37 per month for two years. Total price = 1530.60 inc VAT and delivery. APR 19.8%

APR **19.8%**

*Finance is subject to status. Written details are available on request. Make sure you can afford the payments before entering into a financial agreement.



Systems Featuring or Upgradeable to Intel Pentium processors with

MMX™
Technology



EZ Language 2



Compton's 1997 Encyclopaedia



Interactive Sailing



Will Maker



RAC Rally



Pacioli 2000



Bodyworks 5



Gizmos & Gadgets



Labels Unlimited



Mini Office Typing

These amazing multimedia WinStation desktop systems include a wider range of top multimedia software titles and come with higher specification multimedia components than our PowerStation desktop range. You can also pay using a

wide range of options including Interest Free Credit*, thus allowing you to select a higher specification system and associated printer whilst still keeping within your budget. Whichever system you select you can be confident

that you will be buying a top specification high quality system that is upgradeable to Intel Pentium 200 MMX and comes with full service and support from the UK's leading PC company.



P150

P150 WinStation DT-A

- **P150 Processor** Intel Pentium 150MHz processor.
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX™ technology
- **16Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BAPT approved fax/data/Internet modem
- **14" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speakers system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
- **Standard Features** 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
- **Desktop Case** Colossus desktop case with 7 drive bays for plenty of expansion
- **Full Support and Warranty** 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
- **CD Software Bundle** IMSI EZ language 2 series, Comptons Multimedia Encyclopaedia 1997, Paolioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, Gizmos and Gadgets, RAC Rally, Interactive Sailing, Mini Office Typing and Labels Unlimited

Product Code: 001-30-555



P166

P166 WinStation MMX DT-AM

- **P166 MMX Processor** Intel Pentium P166MHz processor with MMX™ Technology
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX™ technology
- **16Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **1.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **14.4 Modem** Fast BAPT approved fax/data/Internet modem
- **14" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speakers system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
- **Standard Features** 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
- **Desktop Case** Omega desktop case with 7 drive bays for plenty of expansion
- **Full Support and Warranty** 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
- **CD Software Bundle** IMSI EZ language 2 series, Comptons Multimedia Encyclopaedia 1997, Paolioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor In the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, Gizmos and Gadgets, RAC Rally, Interactive Sailing, Mini Office Typing and Labels Unlimited

Product Code: 001-30-581



P166+

P166+ WinStation DT-B

- **P166+ Processor** 6x86 P166+ processor manufactured by IBM/Cyrix.
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX™ technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb. Remember a 32Mb P166+ system gives better performance than a 16Mb P200 MMX system
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BAPT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speakers system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
- **MPEG Software** MPEG facility to playback MPEG-1 video CDs
- **Motherboard** Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200
- **Ports** Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
- **Standard Features** 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
- **Desktop Case** Omega desktop case with 7 drive bays for plenty of expansion
- **Full Support and Warranty** 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
- **User Video** Setting up and using your PC
- **Microsoft Windows 95** Complete with manual and CD
- **Pre-loaded Software Bundle** Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homework and Quicken v5
- **CD Software Bundle** IMSI EZ language 2 series, Comptons Multimedia Encyclopaedia 1997, Paolioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, Gizmos and Gadgets, RAC Rally, Interactive Sailing, Mini Office Typing and Labels Unlimited

Product Code: 380-30-302

£ **1162.08** inc. VAT
 £ **989** +VAT

£ **1256.08** inc. VAT
 £ **1069** +VAT

£ **1267.83** inc. VAT
 £ **1079** +VAT

All offers must end 31st March

01282 777 111

TIME

Sales lines open Mon-Fri 8.30am-7pm, Sat 9am-5pm

Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 Inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability, and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Pack shots are shown for illustration only. EEOE.

TWND2A



Multimedia WinStation Midi Tower

APR **0%***

Interest Free Credit See payment option 2

High specification midi tower multimedia systems with additional software available with three payment options including Interest Free Credit

3 Ways to Pay

Example P166+ WinStation MT-C

1) Pay with order:

Pay the whole amount by credit card / cheque. Total Price £1099 plus £25 delivery and VAT = £1320.70 inc VAT and delivery

2) 6 Months Interest Free Credit: *

Pay just £132.07 (10%) deposit and then nothing for six months, then pay the rest (£1188.63) Total Price = Cash Price. Interest Free Credit. APR 0%

0%

3) 2.5 Years Credit:

Pay just £132.07 (10%) deposit and then nothing for six months, after six months pay £59.43 per month for two years. Total price = £1558.39 inc VAT and delivery. APR 19.8%

19.8%

*Finance is subject to status. Written details are available on request. Make sure you can afford the payments before entering into a financial agreement.

Systems Featuring or Upgradeable to Intel Pentium processors with

MMX™ Technology



EZ Language 2



Comptons 1997 Encyclopaedia



Interactive Sailing



Will Maker



RAC Rally



Pacioli 2000



Bodyworks 5



Gizmos & Gadgets



Labels Unlimited



Mini Office Typing

These powerful multimedia WinStation midi tower systems include a wider range of top multimedia software titles and come with higher specification

multimedia components than our PowerStation midi tower range. You can also pay using a wide range of options including

Interest Free Credit*, thus allowing you to select a higher specification system and associated printer whilst still keeping within your budget.

TWNM2A



P166+

P166+ WinStation MT-C

- **P166+ Processor** 6x86 P166+ processor manufactured by IBM/Cyrix.. Ziff Davis Winstone processor score 86.7 (MDR Labs)
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb. Remember a 32Mb P166+ system gives better performance than a 16Mb P200 MMX system
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speakers system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb system RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard & PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
 - CD Software Bundle IMSI EZ language 2 series, Comptons Multimedia Encyclopaedia 1997, Paccioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, RAC Rally, Interactive Sailing, and Mini Office Typing

Product Code: 001-30-556

£ **1291.33** inc. VAT

£ **1099** +VAT



pentium®

P166

P166 MMX WinStation MT-D

- **P166 Processor with MMX** Intel Pentium 166MHz processor with MMX technology. Ziff Davis Winstone processor score 89 (approx)
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **2.1Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Eight Speed CD-ROM drive** Fast eight speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **16-bit Sound** 16-bit plug and play integrated stereo sound
- **15w Speakers** Stereo mains powered active speakers system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **256k Cache** Fast pipeline burst mode type
- **64-bit Graphics** Fast 64-bit integrated graphics with video acceleration (uses 1Mb RAM; switchable to 2Mb for higher resolution/colours)
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Advanced plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty One year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
 - CD Software Bundle IMSI EZ language 2 series, Comptons Multimedia Encyclopaedia 1997, Paccioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, RAC Rally, Interactive Sailing, and Mini Office Typing

Product Code: 001-30-557

£ **1491.08** inc. VAT

£ **1269** +VAT



P200+

P200+ WinStation MT-E

- **P200+ Processor** 6x86 P200+ processor manufactured by IBM/Cyrix. Ziff Davis Winstone processor score 91.6 (MDR Labs)
- **P200 MMX Upgradeable** upgradeable to Intel Pentium 200MHz processor with MMX technology
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **3.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **15" Screen** Crisp sharp .28dp NI SVGA colour display
- **Twelve Speed CD-ROM drive** Fast twelve speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **32 Wave Table Sound** Genuine Creative Labs SoundBlaster 32 hardware wave table plug and play advanced stereo sound card
- **15w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **512k Cache** Fast pipeline burst mode type
- **64-bit 3D 4Mb Graphics** ATI Rage II 3D graphics processor with 4Mb SGRAM dedicated video memory
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Triton II 430HX Advanced Chipset plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard & PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion
 - Full Support and Warranty 1 year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, GSP Pressworks, Designworks, Homewise and Quicken v5
 - CD Software Bundle IMSI EZ language II series, Comptons Multimedia Encyclopaedia 1997, Paccioli 2000 Accounts Suite, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, BodyWorks v5, Read, Write and Type, KeyCAD Pro, Project Manager Pro, Gizmos and Gadgets, Labels Unlimited, RAC Rally, Interactive Sailing, and Mini Office Typing

Product Code: 001-30-558

£ **1596.83** inc. VAT

£ **1359** +VAT

All offers must end 31st March

01282 777 111

TIME

Sales lines open Mon-Fri 8.30am-7pm, Sat 9am-5pm

Granville House, Blackburn Rd, Simonstone, Burnley, BB12 7GT

Fax No: 01282 77 07 01. Corporate and volume enquiries - please ask for Corporate Sales. Prices exclude courier delivery and handling charge which is normally £29.38 inc VAT (£25 +VAT) for UK mainland. Prices, specifications and offers are subject to change, availability and to our conditions of sale (copies available on request). Systems normally delivered within 7 to 14 days. All orders fulfilled within 28 days unless otherwise specified. Depending on the package software applications are pre-loaded or supplied on CD with on-line help. Pack shots are shown for illustration only. E&OE.

TWNM2A



Ultimate Time Machines

APR **0%***

Interest Free Credit

See payment option 2

The Ultimate Time Machines are the most powerful PC systems you will find anywhere. They come with a very high specification including large 17" screens and advanced multimedia components.

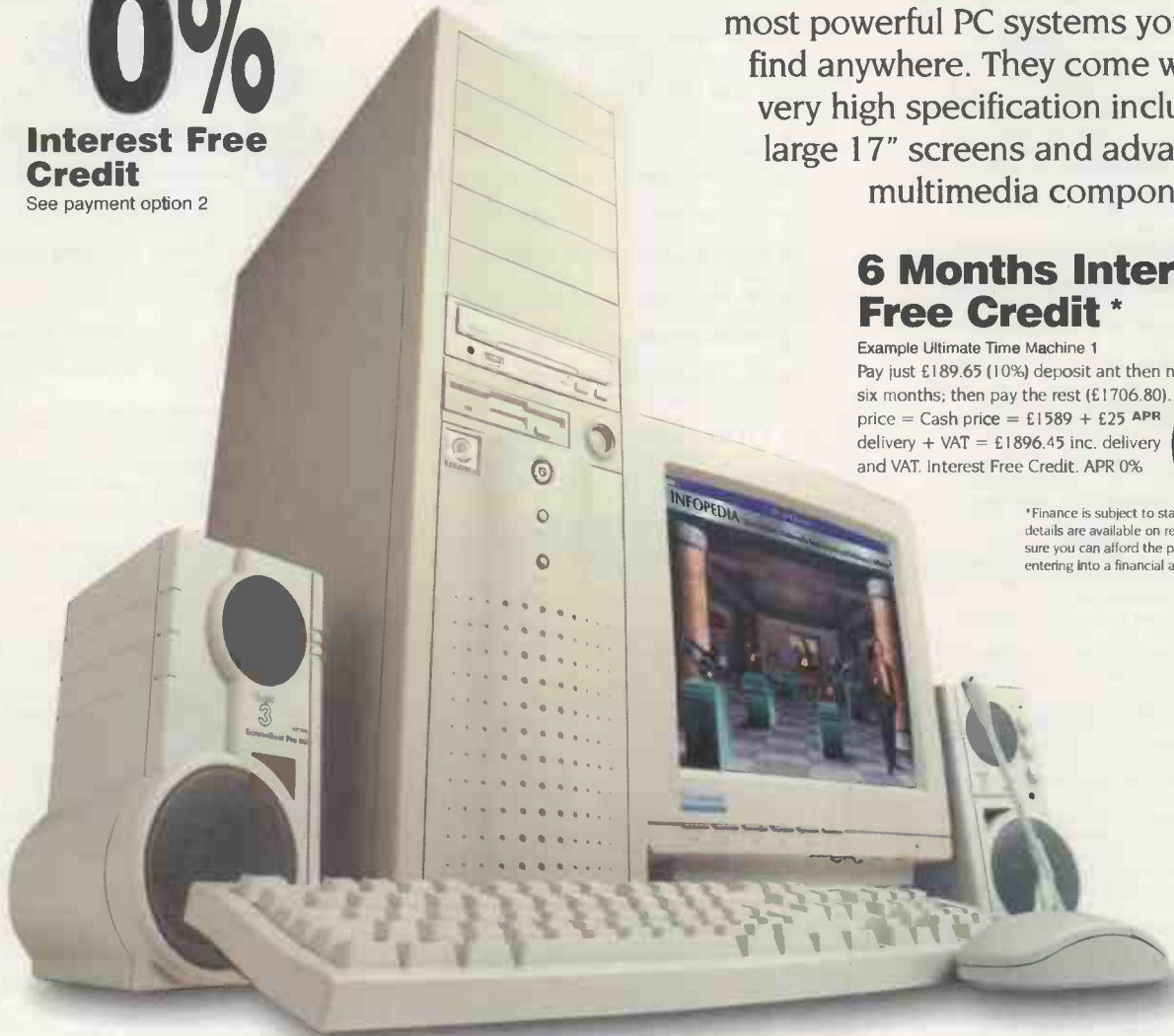
6 Months Interest Free Credit*

Example Ultimate Time Machine 1

Pay just £189.65 (10%) deposit ant then nothing for six months; then pay the rest (£1706.80). Total price = Cash price = £1589 + £25 APR delivery + VAT = £1896.45 inc. delivery and VAT. Interest Free Credit. APR 0%

0%*

*Finance is subject to status. Written details are available on request. Make sure you can afford the payments before entering into a financial agreement.



The 'Best Buy' P200+ midi tower system is unbeatable in terms of specification and performance, all at an incredible £1589 +VAT. It is also upgradeable to Pentium P200 MMX processor at a later date if

required. The P200 MMX full tower system (shown), whilst providing comparable performance with standard software has the added capability to run multimedia software written for the MMX

standard at an even faster speed. It also features a massive 64Mb EDO RAM.

Both systems are available on Buy Now, Pay Later Interest Free Credit terms!

TUTM2A



P200+

Ultimate Time Machine-1

- **P200+ Processor** 6x86 P200+ processor manufactured by IBM/Cyrix. Ziff Davis Winstone processor score 91.6 (MDR Labs)
- **32Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **3.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **17" Screen** Crisp sharp .28dp NI SVGA colour display
- **Twelve Speed CD-ROM drive** Fast twelve speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **32 Wave Table Sound** Genuine Creative Labs SoundBlaster 32 hardware wave table plug and play advanced stereo sound card
- **Large 70w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **512k Cache** Fast pipeline burst mode type
- **64-bit 3D 4Mb Graphics** ATI Rage II 3D graphics processor with 4Mb SGRAM dedicated video memory
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Triton II 430HX Advanced Chipset plug and play with Intel socket 7 allowing upgradeability to Pentium 200 MMX
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion (not shown)
 - Full Support and Warranty One year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
 - CD Software Bundle IMSI EZ Language 2 series, Comptons Multimedia Encyclopaedia 1997, Pacioli 2000 Accounts suits, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, Bodyworks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, Gizmos and Gadgets, Labels Unlimited, RAC Rally, Mini Office Typing and Interactive Sailing

Product Code: 001-30-559

£ **1867.08** inc. VAT

£ **1589** +VAT



P200

Ultimate Time Machine-2

- **P200 Processor with MMX** Intel Pentium 200MHz processor with MMX technology
- **64Mb EDO RAM** Fast EDO RAM expandable to 128Mb
- **3.2Gb Hard Disk** Enhanced IDE hard disk with fast access
- **33.6 Modem** Fast BABT approved fax/data/Internet modem
- **17" Screen** Crisp sharp .28dp NI SVGA colour display
- **Twelve Speed CD-ROM drive** Fast twelve speed CD-ROM drive
- **PC Joystick** For multimedia and leisure software
- **32 Wave Table Sound** Genuine Creative Labs SoundBlaster 32 hardware wave table plug and play advanced stereo sound card
- **Large 70w Speakers** Stereo mains powered active speaker system with A/C adaptor
- **PC Microphone** Advanced PC microphone for voice recording/recognition
- **512k Cache** Fast pipeline burst mode type
- **64-bit 3D 4Mb Graphics** ATI Rage II 3D graphics processor with 4Mb SGRAM dedicated video memory
 - MPEG Software MPEG facility to playback MPEG-1 video CDs
 - Motherboard Triton II 430HX Advanced Chipset plug and play with Intel socket 7
 - Ports Enhanced parallel, PS/2 mouse and two high speed serial ports; joystick / midi port
 - Standard Features 3.5" 1.44Mb floppy drive, 105 Windows 95 keyboard and PS/2 mouse
 - Midi Tower Case Colossus midi tower with 7 drive bays for plenty of expansion (not shown)
 - Full Support and Warranty One year warranty extendable to 3 or 5 years and comprehensive hardware hotline technical support
 - User Video Setting up and using your PC
 - Microsoft Windows 95 Complete with manual and CD
 - Pre-loaded Software Bundle Lotus SmartSuite 96, SmartPics, GSP Pressworks, Designworks, Homewise and Quicken v5
 - CD Software Bundle IMSI EZ Language 2 series, Comptons Multimedia Encyclopaedia 1997, Pacioli 2000 Accounts suits, David Bellamy's Endangered Wildlife, Dr. Hilary Jones' Doctor in the House, Geoff Hamilton's Garden Designer, Instant Greeting Cards, Infopedia UK Encyclopaedia, Comptons World Atlas 1997, Multipedia Bookshelf, Bodyworks v5, Read, Write and Type, KeyCAD Pro, Instant Will Maker, Project Manager Pro, Gizmos and Gadgets, Labels Unlimited, RAC Rally, Mini Office Typing and Interactive Sailing

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- UMAX GEMINI - 800 x 1600 optical **£759** ~~£891.82~~
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We also stock the full range of UMAX Pc's

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Macromedia Backstag Designer Plus page design software !!



- Award winning single pass flatbed scanner
- All SCSI cards, cables & software included
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- 600 x 300 dpi optical resolution (up to 4800 dpi interpolated)
- Adobe Photoshop LE £20 plus v.a.t. extra
- Umax Vistascan software **£199 ex vat** ~~£233.83 inc vat~~
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UMAX S12

Macromedia Backstag Designer Plus page design software !!



- 600 x 1200 optical resolution
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- Adobe Photoshop LE £20 plus v.a.t. extra
- Umax Vistascan software as standard
- One year on-site warranty included
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OPTICPRO 4800P SCANNER



- Easy single pass, full page scanning
- 300 x 600 dpi optical resolution
- Plugs into a standard parallel port
- OCR feature turns written pages into text files
- Compatible with Win 3.x and 95
- Image editing software included **£139 ex vat** ~~£163.32 inc vat~~
- 100% Twain compliant

SPECTRA 1200 SCANNER



- 24-bit multifunction colour scanner
- A scanner, copier and fax in one unit!
- Easy single pass, full page scanning
- OCR feature turns written pages into text files
- Compatible with Win 3.x and 95
- Action Manager software included **£84 ex vat** ~~£96.70 inc vat~~
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EPSON GT-5000



- 24-bit entry level colour flatbed scanner
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- All cables and SCSI cards included
- Upgradeable 12 month warranty **£292 ex vat** ~~£343.10 inc vat~~
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EPSON GT-8500



- 30-bit high quality colour flatbed scanner
- 400 dpi optical (3200 dpi interpolated)
- Easy single or three pass scanning
- Adobe Photoshop LE & Xerox TextBridge OCR
- All cables and SCSI cards included
- Upgradeable 12 month warranty **£426 ex vat** ~~£500.55 inc vat~~
- Parallel version £399 + VAT

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- Brand New 36-bit colour flatbed scanner
- 600 dpi optical resolution (4800 dpi interpolated)
- PhotoShop LE & Xerox TextBridge OCR
- Optional transparency unit and document feeder
- Full Photoshop version (GT19500) £628 plus v.a.t.
- Upgradeable 12 month warranty **£520 ex vat** ~~£611.00 inc vat~~
- Single pass professional model



NEW A4 COLOUR SCANNER FOR £169 + VAT !!



COLORPAGE-CS

- The latest model from Genius !!
 - A4 flatbed single pass scanner
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 - High Speed SCSI interface
 - 300 x 1200 dpi optical resolution
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- New compact Visioneer scanner and keyboard
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ALPS



MD-2010 PRINTER



- Amazing Micro Dry inks
 - 600 x 600 dpi true colour resolution
 - 1200 x 600 dpi laser sharp mono
 - Prints onto transparencies, coat paper and photographs
 - Fade and water resistant
 - A4, letter and postcard paper sizes
 - Metallic ribbon options
 - Adobe PhotoDeluxe software
 - PC or Apple MAC
 - Multiple media options
- £359 ex vat**
£421.82 inc vat

Humedia keyboard	59	69.32	Cyan ribbon 5 pac.	31	36.43
Hi-grade paper x 200	15	17.63	Yellow ribbon 5 pack	31	36.43
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ALPS MD-4000



- Colour printer + scanner in one unit
 - 600 x 600 dpi colour resolution
 - 1200 x 600 dpi black and white
 - Alps Micro-Dry inks
 - Permanent waterproof ink
 - Metallic ribbon options
 - Photo-realistic images
 - 3-5 ppm colour, 1 ppm black
 - Design software included
 - Multiple media options
 - Free sample kit
- £599 ex vat**
£703.82 inc vat

Panasonic

PANASONIC KX-P6100

- Compact Windows laser printer
- 6 pages per minute print speed
- 100 sheet multi-purpose input tray
- 50 sheet face down output tray
- 300 x 300 dpi resolution
- 1 year on-site warranty
- Separate toner & drum

£179 ex vat
£210.32 inc vat

PANASONIC KX-P6150

- Compact DOS/Windows laser printer
- 6 pages per minute print speed
- 100 sheet multi-purpose input tray
- 50 sheet face down output tray
- 300 x 300 dpi enhanced resolution
- 1 year on-site warranty
- Separate toner & drum

£279 ex vat
£327.82 inc vat

PANASONIC KX-P6300

- High resolution Windows laser printer
- 6 pages per minute print speed
- 100 sheet multi-purpose input tray
- HP PCL4.5 emulation
- 600 x 600 dpi resolution
- 1 year on-site warranty
- Separate toner & drum

£218 ex vat
£256.15 inc vat

PANASONIC KX-P6500

- Compact DOS/Windows laser printer
- 6 pages per minute print speed
- 100 sheet multi-purpose input tray
- 50 sheet face down output tray
- 600 x 600 dpi enhanced resolution
- 1 year on-site warranty
- Separate toner & drum

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Adding more features and performance to the ECOSYS range are two new ECOSYS models from Kyocera. The FS-1700 and FS-3700 are available now and offer a wealth of features.

Turn to the next page for full specifications and pricing!!

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LEXMARK 1020

- Brand new compact inkjet from Lexmark!
- Improved version of popular 150C model
- 600 x 300 dpi colour and black printing
- Free Lexmark Workshop software
- On-site warranty options
- Windows 95 and 3.x compatible
- 1 year on-site warranty

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LEXMARK 2030

- New, versatile personal printer
- 3 pages per minute printing
- 600 x 300 dpi colour and black printing
- Free Lexmark Workshop software
- Free ColourFine 2 software
- Windows 95 and 3.1x compatible
- 1 year warranty included

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£206.80 inc vat



LEXMARK 2050

- Sleek, compact model from Lexmark
- An ideal colour solution for the home or office
- 7 pages per minute mono, 1p.p.m colour
- 600 x 600 dpi colour and black printing
- Free Lexmark Workshop software
- Windows 95 and 3.1x compatible
- 1 year warranty included

£199 ex vat
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HL 1260E	12 pages per minute, 600 dpi, 2Mb	£807	948.22
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BROTHER HL-730

- New 6 page per minute improved personal laser
- True 600 dpi printing in Windows (300 dpi in DOS)
- Microfine toner for sharp text and crisper graphics
- Straight Paper Path is ideal for thicker papers
- Enhanced Memory Management Technology
- 200 sheet multi-purpose feeder
- TrueType scaleable fonts on disk

£253 ex vat
£297.27 inc vat



BROTHER HL-760

- New 6 page per minute enhanced laser printer
- 1200 x 600 dpi printing in Windows (600 dpi DOS)
- Microfine toner produces improved resolution
- Straight Paper Path is ideal for various papers
- Enhanced Memory Management Technology
- 200 sheet multi-purpose feeder
- TrueType scaleable fonts on disk

£314 ex vat
£368.95 inc vat



BROTHER HL 1660

- New 16 page per minute enhanced laser printer
- True 1200 dpi printing in Windows
- Microfine toner produces improved resolution
- Straight Paper Path is ideal for various papers
- Enhanced Memory Management Technology
- 200 sheet multi-purpose feeder
- 4Mb Ram as standard

£959 ex vat
£1126.82 inc vat

OKI

For printer consumables, warranties and dot matrix please turn to last page

OKI 610ex - 600 x 600 dpi, 6 ppm, PCL5e, 2Mb Ram	£285	334.87
OKI 400W - 300 x 300 dpi, 4 ppm, PCL4.5, GDI	£244	286.70
OKI 1200ex - 600 x 600 dpi, 12 ppm, PCL5e, 2Mb Ram	£799	938.82
OKI 2010 - 600 x 300 dpi colour inkjet with dual head	£209	245.57
OKI 16N - New high speed laser printer	£749	880.07



OKIPAGE 4W

- The popular LED personal page printer from OKI
- Fast high quality text and graphics output
- Easy on screen software control from Windows
- 600 dpi class printing from within Windows
- Will print to DOS via a Windows DOS box
- Economic Laser-quality output
- Compact space saving design

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OKI 600EX

- 6 page per minute low cost LED
- 600 x 600 dpi with improved Microfine toner
- GDI Mode for rapid Windows printing
- HP PCL 4 emulation for direct DOS printing
- High resolution printing at a low price
- Economic separate toner & drum
- Straight through paper path

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OKI 810EX

- Fast 8 page per minute low cost LED printer
- 600 x 600 dpi with improved Microfine toner
- GDI Mode for faster Windows printing
- HP PCL5e emulation for direct DOS printing
- Networking options are available
- Economic separate toner & drum
- Straight through paper path

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STYLUS 200	£96	115.15	STYLUS COLOUR 200	£127	149.23
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EPL-N1200PS	£1089	1279.58	EPL-1200 EN	£919	1079.83
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STYLUS COLOUR 400

- 720 dpi printing in colour & mono
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- Up to 3ppm Colour, 4ppm Mono printing
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- Optimised printing of Video/Digital Images
- 1 year RTB, 3 year On-site option
- Windows compatible

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STYLUS COLOUR 600

- 1440 dpi colour or true black printing
- Photo Real colour & Laser sharp Mono printing
- Up to 4ppm Colour, 6ppm Mono printing
- Advanced dual ink system with Epson Quick-Dry ink
- Optimised printing of Video/Digital Images
- 1 year RTB, 3 year On-site option
- Windows & Mac compatible

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STYLUS COLOUR 800

- 1440 dpi with Epson Super Micro-Dot
- Photo Real colour & Laser sharp Mono printing
- Ultra fast-upto 7ppm colour, 8ppm mono
- Advanced dual ink system with Epson Quick-Dry ink
- Optimised printing of Video/Digital Images
- 1 year RTB, 3 year On-site option
- Windows & Mac compatible

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- Intel Pentium 100MHz with 8Mb Ram (upgrade to 40Mb)
- 11.3" SVGA STN colour screen and 1Mb Video Ram
- 84 full size keys with Mousepoint & 12 function keys
- 810Mb Hard Disk and Internal 3.5" floppy drive
- Optional port replicator, optional spare batteries.
- 3.2kg with built-in AC adaptor
- One year worldwide warranty

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PORTEGE 620CT

- Intel Pentium 100MHz with 8Mb Ram (upgrade to 40Mb)
- 10.4" TFT colour screen (800 X 600) for up to 16.7M colours
- 84 full size keys with Mousepoint & 12 function keys
- 1.35Gb Hard Disk and 1Mb Video Ram
- Ultra-Slim Ultra-Lightweight model
- Dimensions: 251 x 201 x 48 mm
- Three year worldwide warranty
- 2.2kg ultra light notebook

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£1977.52 inc vat



TECRA 500CDT

- Intel Pentium 120MHz with 16Mb Ram (upgrade to 144Mb)
- 12.1" TFT colour screen and 2Mb Video Ram
- 84 full size keys with Mousepoint & 12 function keys
- 1.35Gb Hard Disk and internal 3.5" floppy drive
- Optional port replicator, optional CD ROM Drive
- 3.6kg with FDD Module fitted
- Three year worldwide warranty
- Dimensions: 299 x 235 x 58 mm

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£2969.22 inc vat

Satellite 200CDS	£1261	1481.67	Portege 650CT	£2745	3225.38
Satellite 110CT	£1345	1580.37	Portege 660CDT	£3329	3911.57
Satellite 200CDT	£1745	2050.38	Tecra 510CS	£2245	2637.88
Sat Pro 430CDS	£1683	1977.52	Tecra 730CDT	£3792	4455.60
Sat Pro 430 CDT	£2275	2673.12	Tecra 510CDT	£3033	3563.77
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ECHOS P100D

- Pentium 100MHz processor with 8Mb Ram (upgrade to 40Mb)
- 10.4" SVGA DSTN back-lit colour screen (16 Million colours)
- PCI Local Bus, 16KB cache, optional 4 speed CD Rom Drive
- 540Mb Hard Disk and point-pad integrated pointing device
- SoundBlaster compatible 16-bit audio card and speakers
- Dimensions: 286 x 228 x 49mm
- Windows 95 or Windows 3.11
- Optional mini docking station

£899 ex vat
£1056.32 inc vat



ECHOS PRO 150S

- Pentium 150MHz processor and 16Mb Ram (upgrade to 128Mb)
- 12.1" TFT SVGA back-lit colour screen (800 x 600)
- PCI Local Bus and 2Mb Video Ram, optional 2nd Hard Disk
- 2.0GB removable Hard Disk and 8 speed CD-ROM
- SoundBlaster compatible 16-bit audio card and speakers
- Dimensions: 310 x 230 x 47.5 mm
- Windows 95 or Windows 3.11
- Optional "hot" docking station

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ECHOS PRO 166XM

- Pentium 166MHz processor and 32Mb Ram (upgrade to 128Mb)
- 12.1" TFT SVGA back-lit colour screen (800 x 600)
- PCI Local Bus and 2Mb Video Ram, optional 2nd Hard Disk
- 3.0GB Hard Disk and 8 speed CD-ROM
- SoundBlaster compatible 16-bit audio card and speakers
- Dimensions: 310 x 230 x 47.5 mm
- Windows 95 or Windows 3.11
- Mini docking station

£3899 ex vat
£4581.32 inc vat

Echos P120D, 10.4" SVGA DSTN, 8Mb Ram, 1Gb, CD-ROM	£1185	1392.37
Echos P120C, 11.3" SVGA DSTN, 8Mb Ram, 810Mb	£1069	1256.07
Echos P120CD, 11.3" SVGA DSTN, 8Mb Ram, 1Gb, CD-ROM	£1234	1449.95
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Echos P133E, 11.3" SVGA TFT, 8Mb Ram, 1.3Gb, CD-ROM	£1878	2207.82
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Echos Pro P133D, 12.1" SVGA CSTN, 8Mb Ram, 1.3Gb, CD-ROM	£1579	1855.32
Echos Pro P133E, 11.3" SVGA TFT, 8Mb Ram, 1.3Gb, CD-ROM	£2094	2460.45
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Tally

- Fully featured high speed lasers
- Designed for both DOS and Windows



T9108 LASER PRINTER

- 8 page per minute low cost laser
- 600 x 600 dpi resolution printing
- 1Mb memory as standard
- 4Mb Ram upgrade just £35 + vat
- Windows printing system
- Real HP PCL 4.5 for DOS
- Small compact design

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10/100 for 10BaseT	£95	111.63
10/100 for Combo	£118	138.65
10/100 u/g to 100Mbps	£69	81.08
CreditCard Modem 33.6		
Creditcard Modem	£145	170.38
Ethernet and Modem		
Combined 33.6 10BT	£234	274.95
Combined 33.6 Combo	£265	311.38
Multiport Modem	£1129	1326.58

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Premier Leather Deluxe Case	£139	163.33
ABS Universal Case	£49	57.58
Leather Notebook Case	£69	81.07
Foliopac 3 Case	£39	45.83
Pilot Carry Case	£79	92.83
Premier Leather Case	£107	125.73

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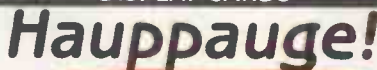
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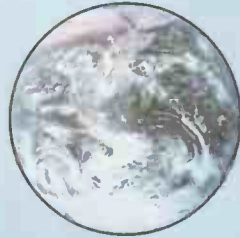
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News

Doctor's orders

If you have ever had the urge to be a hospital administrator, then Theme Hospital, the successor to the 1.5 million selling Theme Park, could be just what the doctor ordered.

As an administrator, you must design, build and run your hospital in the most profitable and efficient way possible. If you find you have unhappy patients, why not cheer them up with strategically placed plants? Or you can put a drinks machine in the holding room for patients waiting for treatment. Don't forget to build those toilets, though...

The better you do, the higher up the career ladder you go until you are the best hospital administrator around.

Theme Hospital is designed to run on any PC from a 486/50MHz with low-resolution monitor to any new PC with standard high-resolution monitor. It will be released on 31st March.

■ **Bullfrog Productions**
01483 579399



Creepy crawlies

Grolier Interactive has announced the forthcoming release of Banzi Bug, its new, quirky 3D flying game. Banzi is the young, hip hero who's trapped in a house full of crazy characters, ranging from a lusty spider to nasty fly-killing humans. As Banzi, your job will be to fly around the house and survive all the trials and tribulations that come your way. The game incorporates Microsoft's DirectX technology and will be available for Windows 95 in mid-April.

■ **Price: £29.99 Contact:**
Grolier Interactive 01865 264800

Three's company

Europress has re-released three successful titles in a three-game bundle called Total Insanity. For £49.99 you get Europress' Rally Championship,

Microprose's Star Trek — The Next Generation: A Final Unity, and Electronic Arts' PGA European Tour.

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Tomb Raider

3D thrills, with a feisty female hero fighting her way through fiends and foes. Great viewpoints.

Tomb Raider is a 3D game with a refreshing difference: you are Lara Croft, a hard-edged female version of Indiana Jones. Your mission is to penetrate an ancient tomb to retrieve the mystical Scion.

Your journey starts in the Caves where you encounter shooting wall-darts, nasty attack-bats and vicious wolves. Luckily you're packing two Colt .45s, so you can blast your way out of some tough scrapes. You'll need to hunt around for special items, door keys, better weapons and secret chambers.

As you progress through the tomb to higher levels, like the City of Vilcabamba,



Lara is one tough lady you wouldn't want to double-cross!

you'll need to sharpen your skills and practice your breast-stroke — Lara has to do a lot of swimming here. The higher you go the more dangers you find, like prehistoric dinosaurs with big appetites.

The most unique feature of the game is Lara's zoom-around camera viewpoint. This aspect of the game is brilliant. As you make her walk, run, jump and swim, it feels as if you were following her with a hand-held video camera. But you'll need a lot of Pentium power to get the most out of the game. It ran fine on a Pentium 150MHz with 32Mb RAM, but it struggled somewhat on a Pentium 120MHz with 32Mb RAM.

Dylan Ambrust

PCW Details

Price £39.99

Contact Eidos Interactive 0181 780 2222

System Requirements MSDOS 5.0 or higher, or Windows 95, Pentium 60MHz (Pentium 90 recommended), 8Mb RAM, 20Mb disk space, dual-speed CD-ROM, SVGA graphics card, 16-bit sound card.

★★★★★

Flying Corps

Join the Brylcreem boys and hunt the Hun in this accurate WWI dog-fight simulation, what!

At first sight, this WWI flying simulation looks the business: plenty of dashing mustachioed heroes leaping into their crates and yelling "Chocks away! Let's get this kite into the air!". But the reality of life as a fighter pilot was grim, so Flying Corps' *raison d'être* is

realism: attention to detail, authentic aircraft performance and accurate landscapes are recreated, and different levels of flying skills are available.

The landscape detail is impressive, but when running on a 133MHz Pentium with 32Mb RAM it is a little jerky and occasionally the action stops completely for a second or two, which is particularly annoying if you are in the middle of a dogfight. You can take any of six aircraft for



a spin and engage in four campaigns: two as a German and two as an Allied flier. There are opportunities to command your own squadron, formations and tactics. The manuals do a superb job of setting the scene for the campaigns and are full of interesting historical information as well as advice from pilots who flew during the war.

Flying and landing the planes is fairly easy, but navigating and fighting other aircraft can be tricky. Attention to detail is

Got to shake that cunning Fokker off my tail

impressive, but it takes a lot of time to learn the basics before you can do anything worthwhile. The manual recommends climbing to several thousand feet and spending time familiarising yourself with the French landscape; not my idea of a good time. If you're a dedicated flight-sim fan you'll get a lot from this game. Others may be put off by the amount of effort involved.

Adam Evans

PCW Details

Price £44.95

Contact Empire Interactive 0181 343 9143

System Requirements 90MHz Pentium (133MHz recommended with 512Kb secondary cache), 16Mb RAM, 5Mb hard disk space (20Mb recommended), four-speed CD-ROM drive. Runs under Windows 95 and DOS.

★★★

p506>

Master of Orion 2

More megalomaniac mastery of the galaxy in this challenging sequel to Master of Orion.

Of you want to be in charge of mighty armies and rule the galaxy, one of the most successful games and one of the better titles in this genre is Master of Orion. And now, the long-awaited sequel, Master of Orion 2 — Battle at Antares (or MOO2) is here.

It boasts SVGA graphics, multi-player options and works under Win95 and DOS, but lacks the multimedia pizzazz of contemporary games.

There are almost no video clips. The battle sequences are visually unappealing and the sound effects and music quickly become monotonous. Nevertheless, MOO2 offers new options at almost every level. Some,



You are controlling the fate of the galaxy, so don't spend all your money in one place

like multiple colonisable planets at each star on the map, seem to add complexity without helping the gameplay, yet others have clearly been added after much testing and feedback from gamers. For instance, in

the original game you could amass huge starfleets, which made it hard to keep track of all your ships, and the battles were rather impersonal. Now ships cost more and there are strict limits to the number an empire can control, so losing even one battleship can be a serious blow.

Even with greatly improved online help it can take weeks of play before you feel you have mastered it. But if you're after a real challenge, few games can match MOO2.

David Brake

PCW Details

Price £34.99

Contact Microprose 01454 893893

System Requirements 486/DX100 or better (Pentium recommended), 8Mb of RAM (16Mb with Windows 95 recommended), double-speed CD-ROM, 75Mb of free HD space, SVGA graphics card, 16-bit sound card.

★★★

Toy Story

Woody & Co. in a charming children's game.

This nice little video game would make an ideal gift for children. The colours are bright and cheerful, Woody's comical expressions and gesticulations revive both the character and the story, and the screen is full of exciting toys.

It is easy to install and the task of getting to the top (seventeenth) level becomes increasingly difficult yet never unmanageable. It's a good game to promote skills development, as each new level demands a higher degree of concentration and a new trick in order to crack it. The manual offers hints but progress depends on your own observation, curiosity and co-ordination. The tasks are fun and range from dodging, to combat, to steering "RC Car": not too difficult, but some persistence is needed.

I appreciated the level of choice available: if you are stuck it's nice to have

Come on, Mr. Potato Head — have a go on the bouncy ball!

alternatives such as higher shelves to explore or different escape actions to use. Although the story screen beginning each level sets the scene well, it lasts nearly two minutes: thankfully you can turn it off before making successive attempts at the same level.

The sound effects are fun. My favourite is the tinkly sound emitted when Woody nabs those omnipresent little gold stars. I would have liked more audio expression of his many deaths, though. He gets savaged by sharks and bumped off (literally) by clowns, but the game doesn't provide different sounds for these events.

Toy Story would appeal to the eight- to twelve-year-olds who still take toys and



picture-book adventures seriously, and can concentrate enough to become engrossed in the gameplay.

Sinéad Carew

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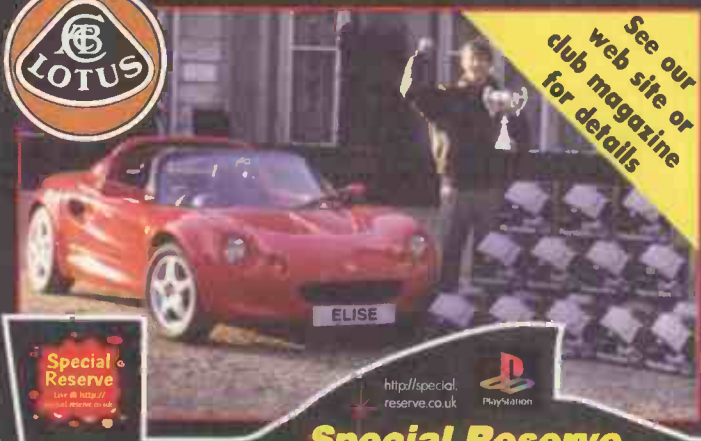
Contact Disney Interactive 0171 341 5505

System Requirements DOS 3.3 or higher, Microsoft Windows 3.1 or 95, 8Mb hard disk space, 8Mb RAM (16Mb recommended), 8-bit soundcard (16-bit recommended), VGA graphics adaptor, double-speed CD-ROM, gamepad or joystick.

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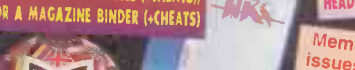
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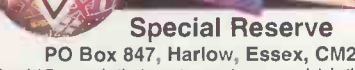
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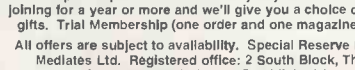
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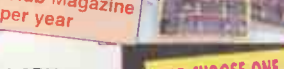
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A rainbow warrior

Simon Rockman remembers the colourful advent of the ZX Spectrum, then the most important computer launch in the UK.

In June 1982, with the bold headline "World Exclusive: ZX Spectrum. We Benchtest Sinclair's new 16k colour micro", *PCW* broke a news item that was so momentous our cover illustration had to be re-shot — a chimpanzee with an artist's palette replaced a man parachuting with a Sharp pocket computer. The chimp was chosen as a follow-on from the ZX-81 cover that had featured a similar simian. The colour palette was chosen because, back then, colour was still a pretty new feature for a small computer.

The hype was understandable because, at the time, the Spectrum was probably the most important computer ever launched in the UK. The BBC Micro might have been a planned attempt to make the country computer literate, but it was the Spectrum which succeeded. In 1982, more people were programming in bedrooms than today.

The price was a lot less than we would expect to pay for a computer now: £125 for the 16K model and £175 for the one with lots of memory, i.e. 48K! In years to come, Alan Sugar was to refer to it as a "pregnant calculator" but in 1982 it was very special. The size of a hardback book but not as heavy, it broke new ground for Sinclair by having actual press-down keys on the keyboard.

The original *PCW* review praised the Spectrum for having all the possible signals on the edge connector. This may have been a result of Sinclair not knowing what would be needed, but it was wonderful for all those third-party programmers who grew up around the machine. Many fortunes were made from building add-ons for the Spectrum.

I've heard it said that if every component in a Spectrum only

just worked to its specification, the machine would have failed: it relied on components being better than the manufacturers guaranteed. The Uncommitted Logic Array (ULA) certainly became very hot on the machine David Tebbutt tested 15 years ago. He also noted that the keyboard, with its multitude of functions on each key, was confusing and you had to look at pretty much every key to find the one you wanted.

For the day, the graphics were great. A resolution of 176 x 256 pixels was offered although colours were limited to the same resolution as text, with 24 lines of 32 characters, so graphics were best limited to monochrome. There was a choice of eight colours, which was seen as being very special. In addition to the software, which allowed lines to be drawn from one point to another, the Spectrum offered user-defined

graphics. So, if your game didn't use the % symbol but did need a picture of a bomb or an alien craft, you could define one of your own within the 8 x 8 grid of a letter. All this could be done using the Basic programming language.

The review praised the machine for having a comprehensive Basic interpreter. It's something of a backward step that machines no longer come with a programming language as standard. Back then it was assumed that you'd be programming, and the strict program editor which inserted spaces was good for encouraging proper style.

The delays between launch and delivery were part of the Sinclair legend; in part, the advance payments for machines financed the production engineering and this led to much bad feeling. The result was a huge

pent-up demand for software when the machines did arrive.

One of my favourite Sinclair anecdotes involves Andrew Glaister. He wrote the program for the game *Orbiter* on paper, using only gleaned information, while waiting for the machine to be delivered. When his early Spectrum arrived he typed in his machine code program but couldn't figure out how to do sound from Assembler, so each time an alien was shot or an explosion was needed, the program popped back into Basic and played the appropriate sound. It was good enough, and the game sold thousands of copies.

For all its praise, the review was realistic enough to point out that the Spectrum was a home machine designed for plugging into a TV. This was long before the advent of disk drives that helped make PCs useful for many other things, but in those days it was perfect for just monkeying around. ■



Brainteasers

Quickie

The idea for this Quickie came to me on New Year's Eve. If a missile were launched at midnight on 31st December 1996 and it travelled towards the sun at a constant speed of one mile per second, would it get there before the millennium, January 2000, assuming it didn't burn up and that it could get beyond the earth's gravity?

This Month's Prize Puzzle

When I was a boy, I had a toy which consisted of a series of hollow open-ended cubes of increasing size which fitted inside each other, in much the same way as Russian Dolls do. The side of each cube was an exact number of centimetres with the edge of each successive cube being one centimetre larger than its immediate predecessor. You could use them as building blocks and they could be stored away in the toy cupboard in the space required by the largest box only.

	2	5	7	8	3	6	8	8	
8	9	2	8	3	2	5	9		1
8	5		6	5	4	4	0	4	8
9	6	9	9	2	1		8	4	3
9	1	3	5		2	3	6	5	4
	9	9	1	3		1	1	9	5
6	9	5	x	2	2	8	9	4	7
3	7	8	2	7	4	9		6	8
1		1	6	0	3	9	4	3	8
	6	3	6	0	3	0	2	2	

The toy was called "The (n+1) Cubes" (I won't tell you what n was) and I could never understand why, since there were only n cubes. I thought one must have been missing, but it wasn't until later when I became interested in mathematical puzzles that I realised where the (n+1)th cube came into it. The sum of the volumes in cubic centimetres of all the boxes was itself a

perfect cube! I can't remember the dimensions of my boxes, but I do recall there were two ways in which that number (n) of boxes could have been produced to meet the stated requirement.

How many boxes were in the set? For the benefit of any pedants that might attempt this problem, my toy cupboard was just an ordinary cupboard and not an aircraft hangar! Send the solution to: PCW Prize Puzzle April 1997, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20th April 1997.

Winner of Jan '97 Prize Puzzle

As usual with the annual number puzzle, we were swamped with entries. The winning card, chosen at random, came from Mr M Mitchell of Winchester who gets our congratulations now and a prize shortly. The winning solution is shown. Meanwhile, keep trying, you could be the next winner.

JJ Clessa

Computations

Oil giveaway

Nearly all the oil pumped out of the British Isles has been during a Conservative government. It started flowing in big quantities in 1976. Since 1979 we've used 7.5 thousand million tonnes. That's 75,000 supertankers (gone forever).

While we burned off that vast treasure, taxation on the resource was reduced. Those pumping the oil, mostly foreign-owned transnationals, are paying less than half the royalties they were when this government came to power, when consumption and prices were comparable (£6,000m adjusted/£2,300m). The tax picture is strange. Individuals on average earnings pay over thirty percent of their profits in tax and National Insurance. Companies pumping out British oil and gas are meant to pay about the same, but actually pay about 6.5 percent on their gross profits.

If those so-called global companies actually paid the same rate as most people in Britain on a typical year's profits of £13 thousand million, it would add £4 thousand million a year to national revenue. This

would exceed the annual revenues from the National Lottery, by more than three times.

■ Source: Gross oil and gas production half-year profits: £6.584 billion (£13.168bn pa). Deductions allowed before taxation: £5.952 billion (£11.904bn pa). Tax paid: £424 million (£848m pa). Inland Revenue (June-Dec 94). Lottery contribution last year: £1.2bn.

Sunny places for shady people

We hear a lot about social security fraud, but we hear little about tax evasion by UK businesses, a practice which multiplied 16 times in value in a decade.

A circular promoting a City conference offers to tell Britain's 100,000 accountants about methods of "getting the taxman to pay the mortgage". Then there's the never-never land of cyberspace, brought to us by computerisation. It was recently revealed that News Corporation paid little UK tax. In bureaucracies you can pass the buck and avoid not only taxes, but responsibility too.

Clever directors have their money-laundry abroad: the Isle of Man, Jersey, Gibraltar, Luxembourg and Switzerland's

corrupt canton of Vaud. British money's sunny place is the Cayman Islands, which is much smaller than the Isle of Wight, with one-fifth its population. Its residents are British subjects but not payers of UK tax. Cayman Islands has 546 banks, over twice as many as London (213). Along with the British Virgin Islands, it has the offices of 100,000 companies. Compared with more than a million UK companies, that's about one-in-ten for each company registered in Britain, and so British taxes are avoided.

Be sure the pence-in-the-pound taxation debate in the British general election is of minimum concern to persons using these financial facilities in the sun.

■ Source: HM Treasury/Cayman Islands High Commission. Nominee tax-avoidance and money-laundering companies lodged in the Virgin Islands, 65,000: in the Cayman Islands, 34,000; BBC News & Current Affairs. Tax dodgers form 10,000 secret companies a year in the British Virgin Islands. Secret companies registered in the Virgin Islands in 1986, 5,000; in 1992, 65,000.

Rowland Morgan

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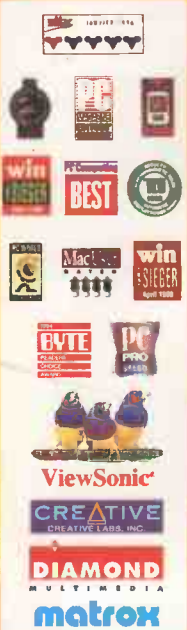
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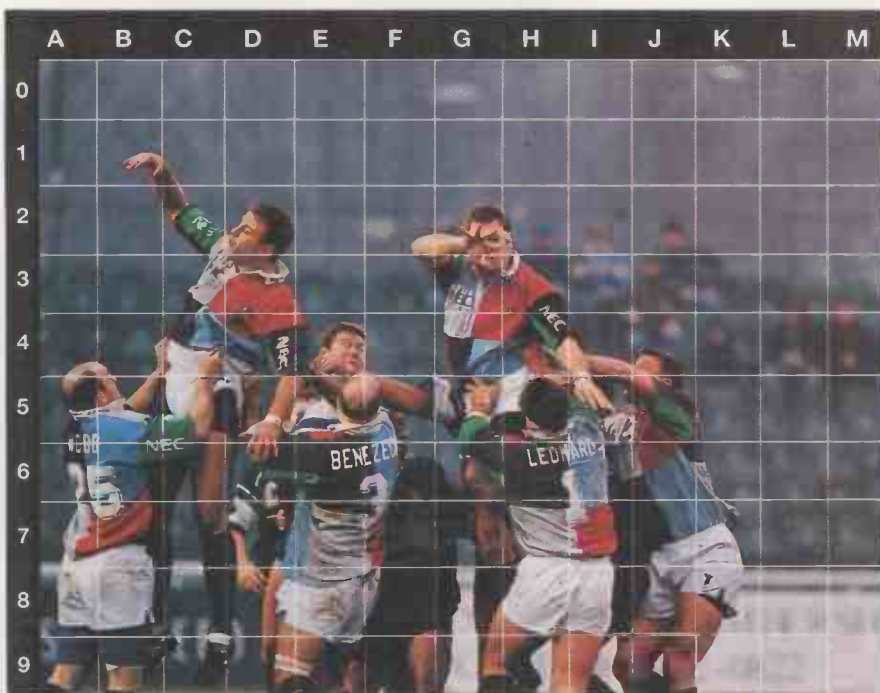
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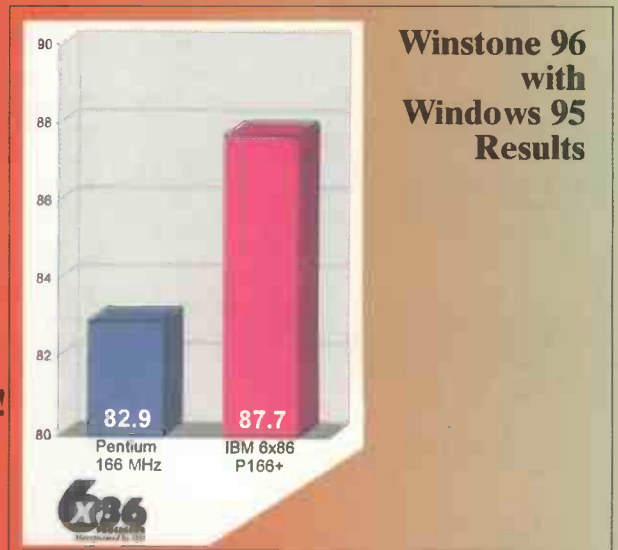
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*Results confirmed with MDR Labs, "Performance Analysis of the 6x86".
*Edge Enforcer was not used for the above tests, therefore results may vary.

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		Technomatic	430/477		

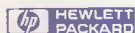
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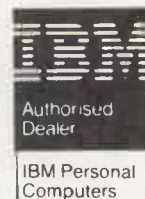
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News & Views

VISUAL BASIC 5.0

At Last, VB Gets a Compiler!

Visual Basic 5.0 is finally due to be launched on March 19th. We have no firm details yet, but it is expected to include the following:

- Developer Studio IDE with "smart" editor, SDI or MDI, new forms engine, lots more
- Native Code Compiler (not in Standard) or p-code.
- Create ActiveX Controls and put them on your Office 97 toolbars
- Function Addresses allow callbacks (hurrray!)
- Rational Object Modeler supports business process, data, object & application modeling, generates source code
- Enterprise Edition includes a repository (with API), advanced network OLE functions and database enhancements (high-speed local cursors, batch updates, cursor update events, asynchronous options, etc, etc)

Plus much, much more, as they say! Call us for full details and pricing, including updates.

VISUAL C++ 5.0

More Client/Server & Web Support

Visual C++ 5.0 is also due on March 19th - expected new features include:

- ActiveX Template Library (ATL)
- Thin-Client rapid development with MFC
- Three-Tier apps with COM and the new Transaction Server

Call us for full details on this exciting new release.

VISUAL J++ 1.1

Create COM objects

Visual J++ 1.1 is also due on March 19th - it will let you create COM objects and integrate them into a Web server for use by any browser.

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ASYMETRIX SUPERCEDE

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- Native Machine Code can be generated, or Java bytecodes
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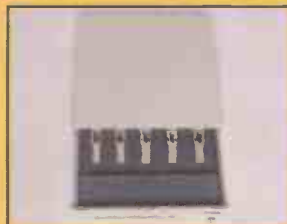
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ELECTRONE

General

9001 KEYBOARD

The 9001 squeezes 86 keys into the smallest footprint with full travel tactile keys, 17mm key spacing and embedded numeric pad. They don't come much smaller than this!

MINIKB

Occupying less space than an A4 sheet, the MINIKB has 85 full size tactile click keyswitches. Full typing area, function key row and cursor controls. Optional number pad available.

MCK142 PRO

All the keys you'll ever need! Two sets of function keys, enhanced style 102 layout and 24 user-programmable function keys. A great keyboard for terminal emulation.

MICROPADS

Keypads for all applications: numeric pads for notebooks, keyboard replacements, function keypads – we can customise the standard models or make complete custom designs to match your needs exactly.

TRACKBALLS

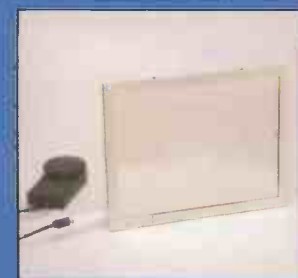
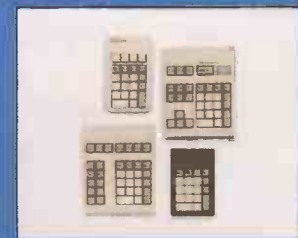
Our new trackball range features the new infrared Star Track for remote control of presentation, demonstration and any other mouse applications. Two desktop models offer the choice of thumb or finger operations with two enclosure styles. All trackballs can directly replace a serial mouse.

TOUCH SCREENS

Our new touch screen panel clips directly to your existing monitor and, through the supplied serial interface and software, can emulate a mouse for instant touch control of your applications – or use it as a development tool for your own touch screen programmes. Fits 14" and 15" screens. Bonded touch monitors also available.

KEYPORT

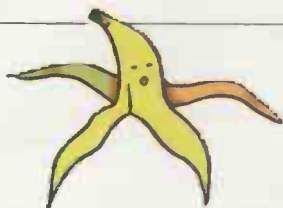
The latest Keyports now include a full PC keyboard wedge interface – just plug into the keyboard port, with or without your keyboard attached, and you're ready to programme your own layout. Software to download programme and design overlay included.



ELECTRONE

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ChipChat



Oops!

■ In last month's Palmtops group test we inadvertently used the term "biro" as a generic term to describe a ballpoint pen. Biro Bic has informed us that the term "biro" must, in fact, be "Biro" and should only be used in connection with ballpoint pens... er, Biro ballpoint pens. We apologise for any confusion caused to our readers.

Microsoft boob

We've heard of support, but it looks like Microsoft has gone too far this time. It seems that Asda is now selling a "microsoft" bra! Inside sources say that Microsoft is aiming to "lift and separate" instead of "embrace and extend" for this particular product line.

There are, however, concerns over the potential confusion of product lines between Microsoft's Visual C++ programming package and the new microsoft C-cup bras. It has been said that programmers might confuse the microsoft bras with the old programming interface and attempt to get hands-on experience. One can only hope that they read the manual first before trying them out.



Caption competition



"If only we had British Rail in the States."

Think you can do better? Then email

captions@vnu.co.uk, enter via our web site, or

write to the usual PCW address with your own captions on a postcard marked "Caption Compo", before 15th May. We'll print the funniest entry and the winner will receive a £20 book token.



Congratulations to Alan Aldous who won February's caption competition with this:

"It's up to you — give me ten million or I play track 13 of Barry Manilow's Greatest Hits."

Ear ear!

Following a blistering Micrografx press conference for Graphics Suite 2, a certain freelance (who shall remain nameless) was seen chatting with David Whitewood, the youthful and earnest UK general manager. Nothing wrong with that, apart from the

fact that the said freelance seemed to have a somewhat eccentric habit of sticking the arm of his spectacles in his ear. During the conversation he had a good old dig around until he had prised out the offending lump of wax, took a look at it, wiped it off and replaced his glasses, continuing to chat all the while.

Either Mr Whitewood somehow failed to notice, or was so taken aback by this public display of aural excavation that he was simply rendered speechless, rooted to the spot. All credit to him for remaining professional enough to appear undaunted throughout the entire unsavoury episode.

What a guy!

Travel sickness

PCW's own features editor, Gordon Laing, sadly appears to be £30 out of pocket due to a rather unfortunate experience on the railway.

Last month, Mr Laing was invited to visit the Sony plant in "sunny Weybridge" (his description). Ever eager to see yet another factory assembly line, he dashed rather belatedly to Waterloo station to catch the 17:20. On arrival at the station he approached the ticket office and asked for a ticket to Weymouth (about 120 miles down the line) whereupon he was told that it would cost him £30.

Gordon normally pays £3 for the trip, so, dazed and confused, he questioned the booking clerk about whether the fare to "Weymouth" was indeed £30... Surely it couldn't be this much? The man behind the window answered in the affirmative, and so our poor cash-strapped colleague sheepishly handed over his money and ran for the train.

One can only imagine the feeling of horror when Gordon arrived, just 15 minutes later, at, lo and behold, Weybridge in Surrey, a mere 20 miles down the line. Way to go, Gordon!

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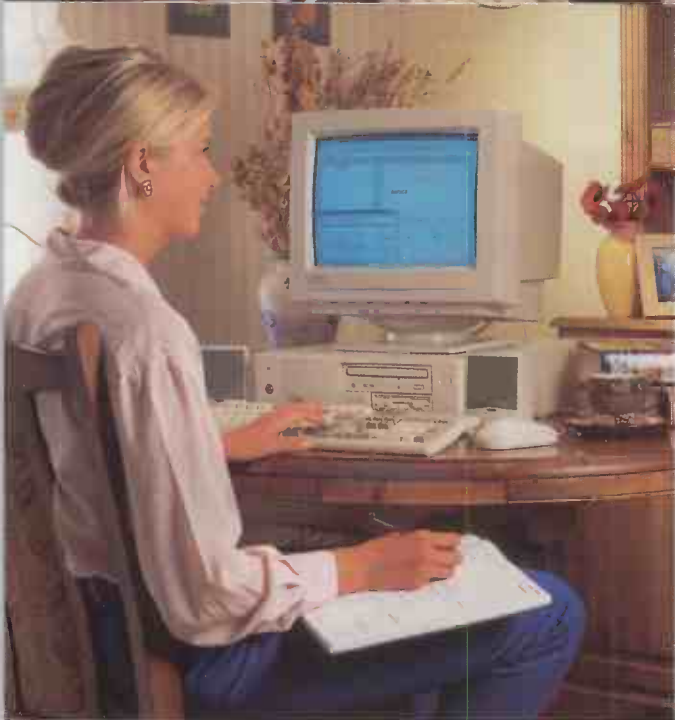
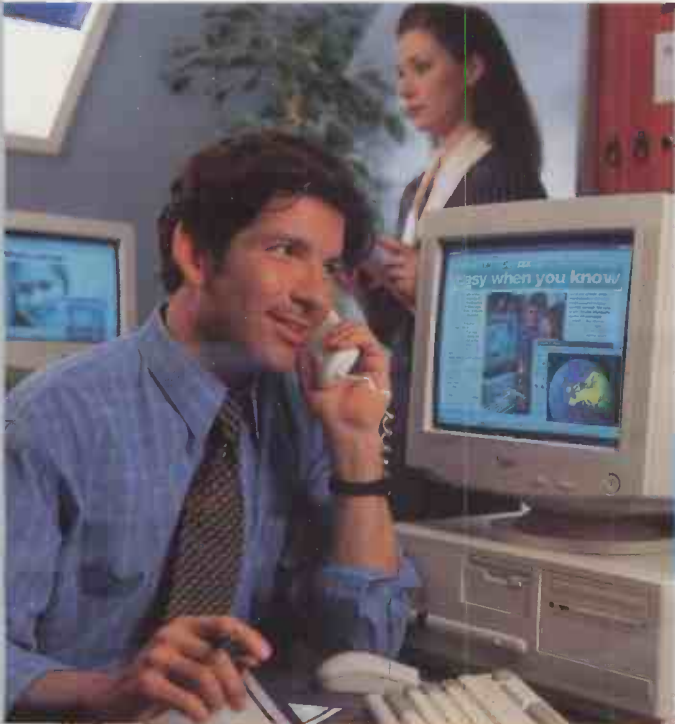
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
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MMX[™]
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3 AWESOME[™] 200M

The Awesome 200M as the name suggests is one of the most powerful and feature packed multimedia PCs imaginable. Check out the 3D graphics and sound, 33.6 kbps voice/fax modem, 12 speed CD ROM and the only PC in UK with a photo scanner drive (a must for your photos and web pages). And, now combined with Intel[®] MMX[™] technology, this system really is awesome!

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- 3GB Hard Drive ■ 2 USB Sockets ■ 12 Speed CD ROM
- 3D Ultra Fast Graphics with 4MB ■ 17" Colour Monitor* with built in speakers
- 3D Sound Card with wave table
- Yamaha stereo speakers with subwoofer
- 33.6kbps voice/fax modem with Internet access
- Photo scanner drive
- Intra Red IrDA fitted
- Family bundle C (see software packages)
- 5 of the most advanced software titles specifically written to take advantage of Intel MMX[™] technology.

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MMX[™]
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Software packages

The Viglen configurations shown are bundled with different software packages. Each package is outlined here to help you choose the configuration that's right for you.

Family bundle A

Microsoft[®] Works for Windows[®] 95 Five essential tools for easier everyday computing. Word processing, spreadsheet, database, graphics and communications tools.

The Family Bundle A includes the following:

- **ENCARTA[®] 97 (US version)** The complete interactive Multimedia Encyclopedia. This best selling and award winning title condenses 28 volumes into one CD. Maps, charts, sound and pictures bring information to life!
- **Microsoft[®] Money[®] '97** A complete set of financial management and planning tools to manage your investments and expenditure.
- **Fine Artist (US version)** Create everything from multimedia picture shows to posters and other cool stuff. Fine Artist has the tools every artist needs for drawing and painting plus a few surprises like animation, sound, high quality graphics, tips and tricks.
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New Family bundle B

The Family bundle B is the same as the Family bundle A but also includes the following:

■ **Microsoft[®] Publisher** This desktop publishing software is the key to producing professional quality output, layouts and clip art.

Family bundle C

The Family bundle C is the same as the New Family bundle B but also includes the following 3D graphic technology games:

- **Wipeout by Psygnosis Ltd** The next generation racing game.
- **Mechwarrior 2 by Activision** A futuristic 3D mechanical vehicle combat simulation game.
- **Assault Rigs by Psygnosis Ltd** A cyberspace clash of the future.

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Software bonus upgrades

All the configurations shown can be further upgraded to include one of the following professional integrated software applications from Microsoft at a very special bonus upgrade price. If you require pre-installation please specify and allow extra delivery time for these options.

■ **Microsoft[®] Office for Windows[®] 97**
Order code WAPMY97A Bonus Upgrade Price £199 Inc VAT (CD version with manual).

■ **Microsoft[®] Office Professional for Windows[®] 97**
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Microsoft[®] Office Pro Education license
only £89 inc VAT.
Please call for details.

Please note some software may be supplied in Viglen OEM packaging.

Monitor upgrade

You can upgrade the monitor in the specific configuration to a higher model by adding the following prices:

Upgrade from	to	Price inc VAT
14"	15"	£105
14"	17"	£344
15"	17"	£239
17"	17" Enhanced	£95

*MONITOR VIEWING AREA

14" = 13.2" viewable
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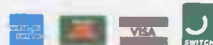
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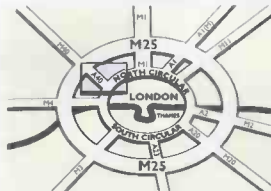


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Please ring 01603 694153 for pricing details.

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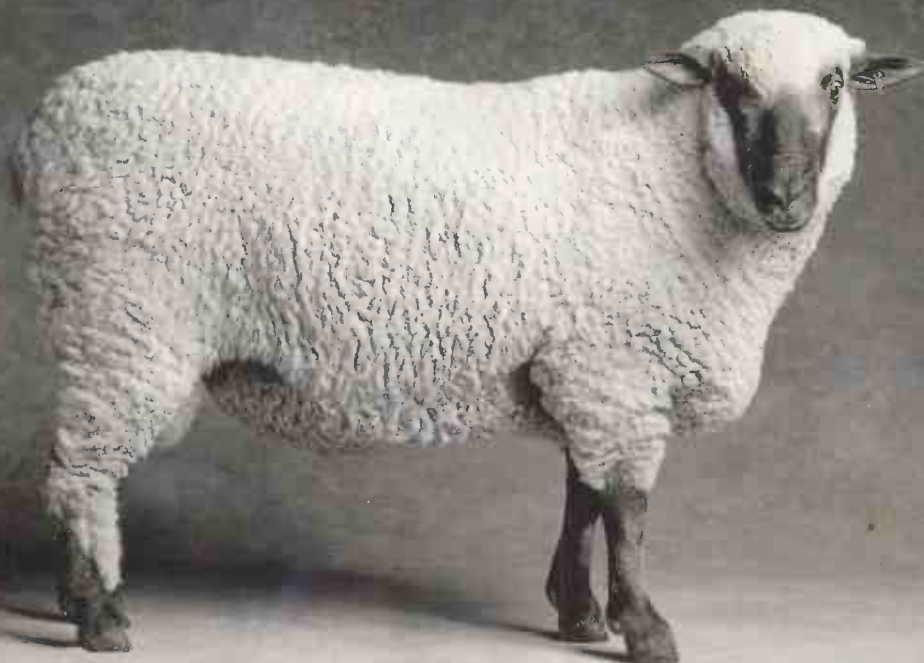
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And save you looking very sheepish in the future.

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