

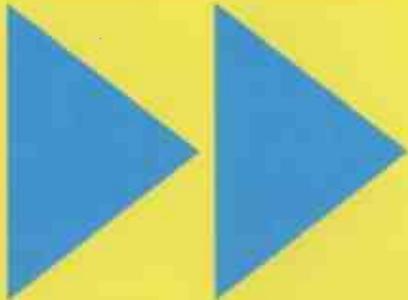
WORKSHOP:
HOW TO MAKE
A DVD MOVIE AT HOME

PERSONAL COMPUTER WORLD

JULY 2002

www.pcw.co.uk

POWER BOOST YOUR PC!



**TOP INSIDER TIPS
TO FAST FORWARD
ANY PC'S
PERFORMANCE**

NEC Versa C180

Sneak preview of the first laptop with AMD's Athlon Thoroughbred chip



Reviews

Mesh's speedy £699 PC, Toshiba's slim e310 Pocket PC, Lexmark's affordable high-res Z65 printer, Powerquest's Drive Image 2002, Pure Motion's Edit Studio 3 and more...



SOFTWARE ON CD

How to:

- Protect your passwords
- Customise Desktop icons
- Speed up your Windows XP boot time
- Convert FAT32 to NTFS in Windows 2000
- Outsmart malicious worms in Outlook Express



LAPTOPS FOR LESS

Portable PCs from £938

DIGICAM DELIGHTS

8 budget digital cameras reviewed



HOT REVIEW!

Dreamweaver MX & Fireworks MX revealed

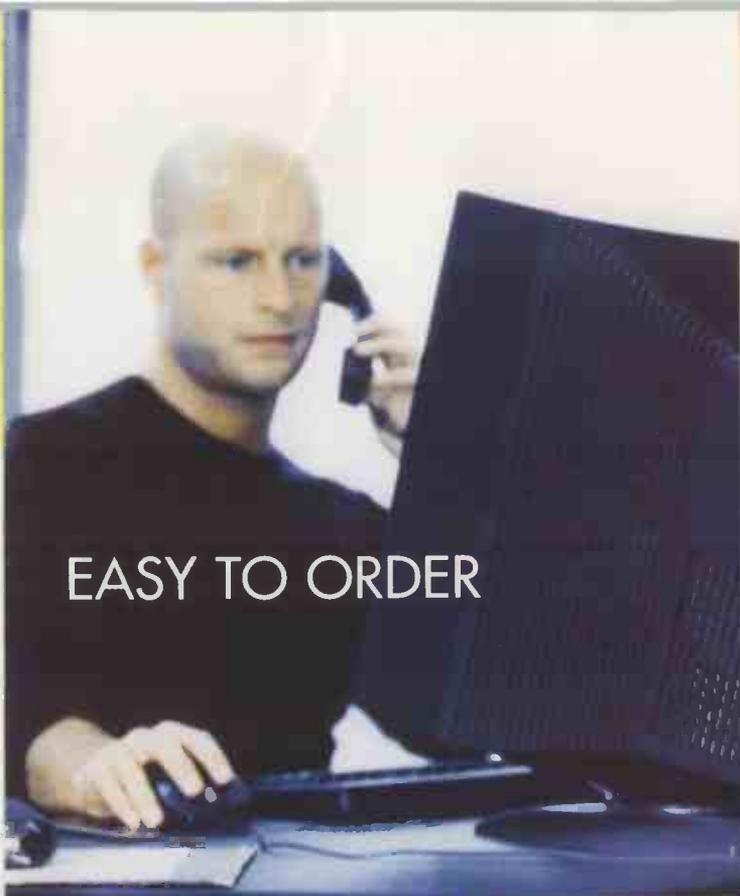
IF YOUR COVER DISC IS MISSING PLEASE ASK YOUR NEWSAGENT

PCW EXPERT: All you need to know about Windows, plus 2 workshops
NEWS REPORT: Organic logic - from folding screens to high-res cyberskin

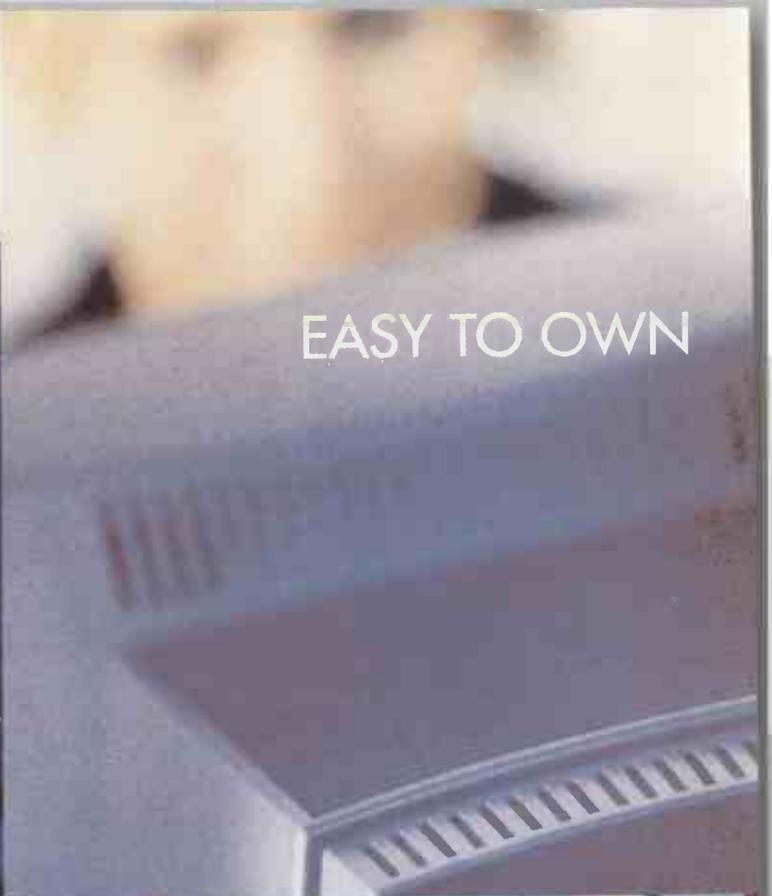
JULY 2002
£3.25
Overseas price £3.95
volume 25 number 7



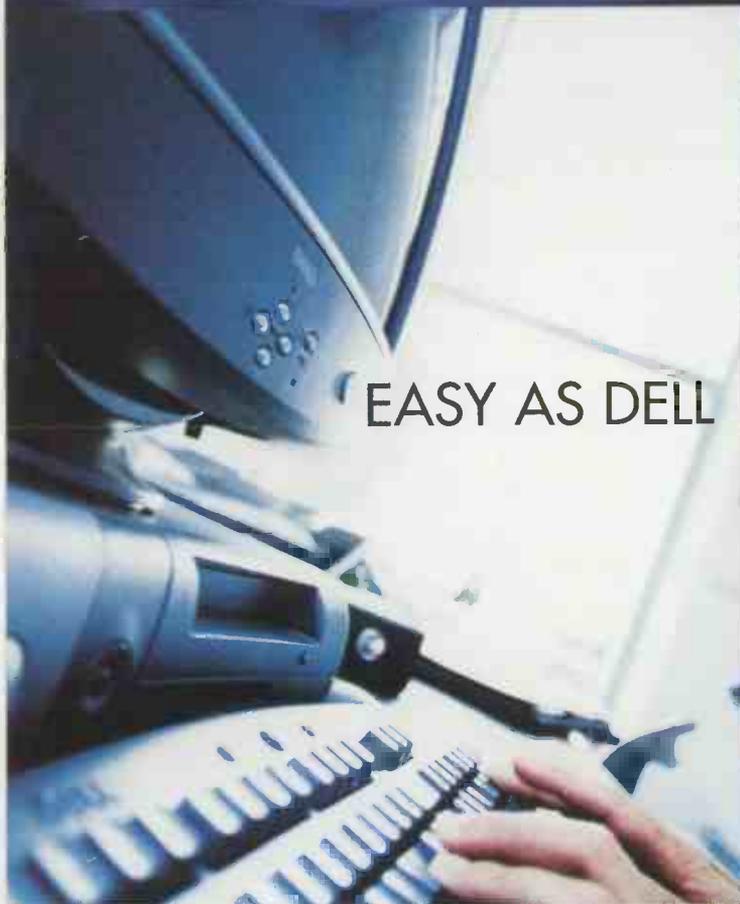
9 770142 023090 07



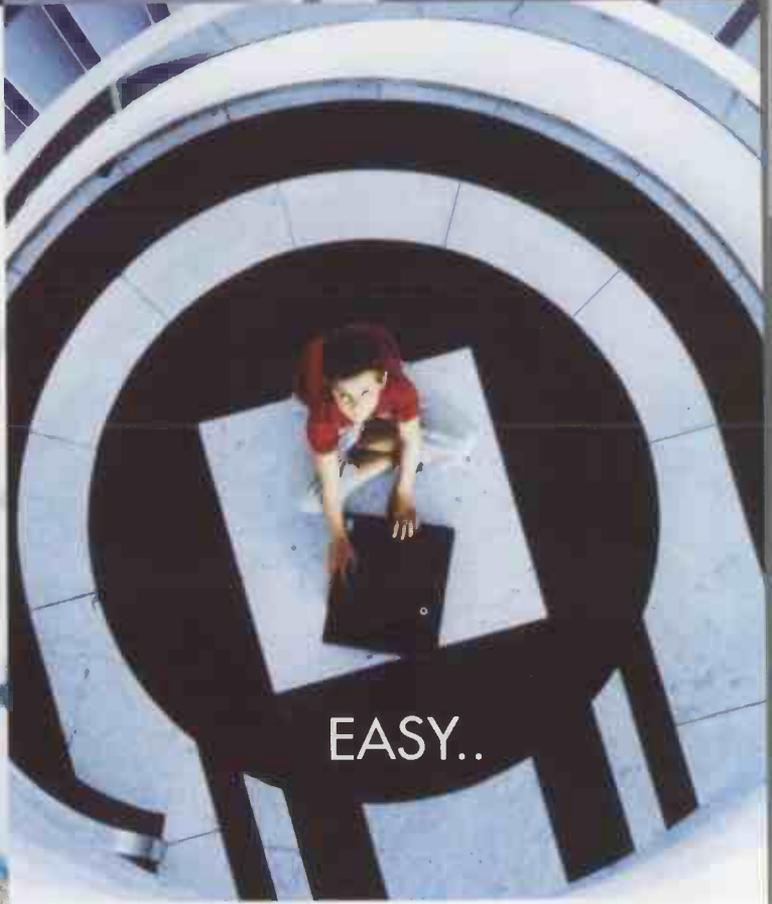
EASY TO ORDER



EASY TO OWN



EASY AS DELL



EASY..





DELL.



DELL DIMENSION 8200

Dell PC Solutions

Choose a Dell™ Dimension™ that best meets your needs—from the affordable 2200 Series to the 4400 with DDR RAM and 8200 RD RAM both of which feature highspeed Intel® Pentium® 4 processors.

DELL™ DIMENSION™ 2200 1300c

- INTEL® CELERON™ PROCESSOR 1.3GHz
- 128MB Single Channel Memory (SDRAM)
- 20GB Ultra Hard Drive
- 15" Colour Monitor (13.8" v.i.s*, 0.28 dot pitch)
- Integrated Intel 810 Video Controller
- 20/48X Max CD-ROM Drive
- Sound Blaster Compatible On Board Sound
- Microsoft Windows XP²
- Microsoft® Works V6.0

FREE PROCESSOR UPGRADE
WAS 1.2GHz
NOW 1.3GHz

£449 EX. DEL & VAT

£585 INC. DEL & VAT

*36 Month Technology Business Plan at

£21.19 P.M.* INC. DEL & VAT

E-VALUE: 004 D0106

UPGRADE TO

40GB Hard Drive and 17" Monitor
for **£79** EXC VAT. (**£92.83** INC. VAT)

DELL DIMENSION 8200 2.0GHz (512 Cache)

- INTEL® PENTIUM® 4 PROCESSOR 2.0GHz (512 Cache) (Was 1.9GHz)
- 128MB Dual Channel Memory (RDRAM)
- 40GB Ultra Hard Drive
- 17" Colour Monitor (15.9" v.i.s*, 0.28 dot pitch)
- 16MB ATI Rage 128 Pro Graphics Card
- Optical CD-RW Drive
- Sound Blaster Compatible On Board Sound
- Microsoft Windows XP²
- Microsoft® Works V6.0

FREE PROCESSOR UPGRADE & £50 OFF (EX.VAT)

£699 EX. DEL & VAT

£879 INC. DEL & VAT

*36 Month Technology Business Plan at

£31.83 P.M.* INC. DEL & VAT

E-VALUE: 004 D0606

UPGRADE TO

a 19" Monitor
for **£95** EXC VAT. (**£112** INC. VAT)

DELL DIMENSION 8200 2.2GHz (512 Cache)

- INTEL PENTIUM 4 PROCESSOR 2.2GHz (512 Cache) (Was 2.0GHz)
- 256MB Dual Channel Memory (RDRAM)
- 40GB Ultra Hard Drive
- 17" Colour Monitor (15.9" v.i.s, 0.28 dot pitch)
- nVidia 64MB GeForce2 MX TV OUT
- 16X DVD-ROM
- Optical CD-RW Drive
- Sound Blaster Live! Value 1024 Voice Sound Card
- Harmon Kardon Speakers
- Microsoft Windows XP²
- Microsoft® Works V6.0
- 56K Data/Fax/Voice Modem

FREE PROCESSOR UPGRADE & £50 OFF (EX.VAT)

£899 EX. DEL & VAT

£1,114 INC. DEL & VAT

*36 Month Technology Business Plan at

£40.35 P.M.* INC. DEL & VAT

E-VALUE: 004 D1006

UPGRADE TO

a 17" Ultrascan
for **£90** EXC VAT. (**£106** INC. VAT)



Lexmark² E210

CHECK OUT OUR NEW RANGE OF LEXMARK² LASER PRINTERS

Lexmark² Laserjet E210 **£178** EX.VAT (**£208** INC.VAT)

Lexmark² E322 **£300** EX.VAT (**£351** INC.VAT)

Lexmark² T520DN **£985** EX.VAT (**£1,152** INC.VAT)



Lexmark² E322

Prices and specifications are correct at date of publication but subject to availability or change without notice. Delivery charge is £49 (£57.50 inc.VAT) per system. Dell's Terms and Conditions of Sales and Service apply and are available on request. Service may be provided via telephone or internet where appropriate. Certain restrictions apply. ²Third party products are covered by third party manufacturers warranty. ³Upgrade prices apply with system purchase only. ⁴Delivery Charge of £8.81 of Dell Computer Corporation, Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron and SpeedStep are trademarks of Intel Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other trademarks are the property of their respective owners. *Finance is available from Dell Financial Services which is a trading style of Tyco Capital (UK) Limited, an affiliate of Tyco Capital Corporation, Registered Office, Ringside House, 79 High Street, Bracknell, Berkshire, RG12 1DZ Correspondence address: Dell Financial Services, 79 High Street, Bracknell, Berkshire, RG12 1DZ. Debit and include delivery charges and VAT. Prices are correct at time of going to press & are subject to change during the term of this offer without notice. Dell Financial Services' terms & conditions & up to date written quotations are available upon request.

EASY DECISION.



DELL INSPIRON 8200

Dell | Mobile

Lightweight, mobile and powerful. That's the Dell™ Inspiron™ range of notebooks. And with savings across the range, they're lighter on your budget than ever before.

SmartPC 100N c1.06GHz GT MOBILE COMPUTING STARTS HERE

- MOBILE INTEL CELERON PROCESSOR 1.06GHz
- 14.1" XGA TFT (1024 X 768) Screen
- 128MB 100MHz SDRAM
- 20GB Removable EIDE Hard Drive
- 24X Max CD-ROM
- Intel Integrated 3D AGP Graphics with up to 32MB Shared System Memory
- 3D Positional Sound with Wavetable
- Integrated Touchpad
- Integrated 56kps V90 Modem
- NEW Microsoft® Windows® XP
- Microsoft® Works 6.0
- 90 Day Euro Collect and Return Service¹

£749 EX. DEL & VAT

£1,055.15 INC. DEL & VAT

*36 Month Technology Business Plan at

£38.22 P.M.* INC. DEL & VAT

E-VALUE: 004 10106

UPGRADE TO

a carry case for **£25** EXC VAT. (**£29.38** INC. VAT) and upgrade to **1 year Collect and Return service** for **£79** EXC VAT. (**£92.83** INC. VAT)

DELL INSPIRON 4100 1.06GHz GT LIGHT AND POWERFUL

- MOBILE INTEL CELERON PROCESSOR 1.06GHz
- 14.1" XGA TFT (1024 X 768) Screen
- 128MB 133MHz SDRAM
- 20GB Removable EIDE Hard Drive
- Interchangable 2/8x Max DVD-ROM & Floppy Drive
- High Performance ATI Rage 3D Graphics with 16MB Video Memory
- Harmon Kardon Audio
- IEEE 1394 Firewire port
- Integrated Touchpad and Trackstick
- Integrated 56kps V90 Modem - 10/100 Ethernet
- NEW Microsoft® Windows® XP
- Microsoft® Works 6.0
- 1 Year Euro Collect and Return Service¹

INCLUDES LEATHER SADDLEBAG AND SPARE BATTERY

£1,099 EX. DEL & VAT

£1,348.90 INC. DEL & VAT

*36 Month Technology Business Plan at

£48.86 P.M.* INC. DEL & VAT

E-VALUE: 004 11106

UPGRADE TO

256MB Memory for only **£100** EXC VAT. (**£117.50** INC. VAT) and **30GB hard drive** for **£79** EXC VAT. (**£92.83** INC. VAT)

DELL INSPIRON 8200 1.8GHz BT THE MOBILE POWERHOUSE

- MOBILE INTEL® PENTIUM® 4 PROCESSOR 1.8GHz - M FEATURING INTEL® SPEEDSTEP™ TECHNOLOGY
- 15" Enhanced Ultra XGA TFT (1600X1200) Screen
- 256MB 266MHz DDR Memory
- 40GB Removable EIDE Hard Drive
- **Integrated DVD & CD-RW Combo Drive**
- Geforce4 Go 440 64MB
- Harmon Kardon Audio
- Integrated Touchpad and Trackstick
- Integrated 56kps V90 Modem - 10/100 Ethernet
- NEW Microsoft® Windows® XP
- Microsoft® Works 6.0
- 1 Year Euro Collect and Return Service¹

FREE SCREEN UPGRADE & £100 OFF (EX.VAT)

£1,799 EX. DEL & VAT

£2,053.90 INC. DEL & VAT

*36 Month Technology Business Plan at

£74.39 P.M.* INC. DEL & VAT

E-VALUE: 004 11006

UPGRADE TO

512MB memory for **£149** EXC VAT. (**£175.01** INC. VAT)

DELL PCs USE GENUINE MICROSOFT® WINDOWS®
www.microsoft.com/piracy/howtotell



CompleteCare™ Accidental damage cover for Dell notebooks³.

3 years cover + 3 year service support - for **£279** EX.VAT

Phone and ask for details.



THE EASY WAY TO ORDER ONLINE

Just enter the E-Value code to take you to that offer

A

SPECIAL DEALS OF THE MONTH



DELL DIMENSION 8200

DELL™ DIMENSION™ 8200 2.2GHz (512K Cache)

- INTEL® PENTIUM® 4 PROCESSOR 2.2GHz
- Now Includes Free Processor Upgrade Was 2.0GHz Now 2.2GHz and £100 off
- 256MB Dual Channel Memory RDRAM
- 40GB Ultra Hard Drive
- 15" Analogue Flat Panel Monitor (15.0"v.i.s.')
- nVidia 64MB GeForce2 MX TV Out
- 16X DVD-ROM
- Sound Blaster Live! Value 1024 Voice Sound Card
- Harmon Kardon 395 Speakers
- Microsoft Windows XP[®]
- Microsoft® Works V6.0
- 56K Data/Fax/Voice Modem

**FREE PROCESSOR
UPGRADE &
£100 OFF** (EX.VAT)

£1,014 EX. DEL & VAT

£1,249 INC. DEL & VAT

*36 Month Technology Business Plan at

£45.24 P.M.* INC. DEL & VAT

E-VALUE: 004 D2206

UPGRADE TO
80GB and HK 695 Speakers
for only £102 EXC VAT. (£120 INC. VAT)



DELL INSPIRON 2650

NEW DELL INSPIRON™ 2650 1.6GHz GT

- MOBILE INTEL® PENTIUM® 4 PROCESSOR 1.6GHz - M FEATURING INTEL® SPEEDSTEP™ TECHNOLOGY
- Now Includes Free Processor Upgrade Was 1.4GHz Now 1.6GHz and £100 off
- 14.1" XGA TFT (1024 X 768) Screen
- 128MB 266MHz DDR Memory
- 20GB Removable EIDE Hard Drive
- Integrated 10/24x Max CD-ROM & Floppy Drive
- nVidia GeForce2 Go 100 with 8MB Video Memory
- 3D Positional Sound with Wavetable
- Integrated Touchpad
- Integrated 56kps V90 Modem
- NEW Microsoft® Windows® XP
- Microsoft® Works 6.0
- 1 Year Euro Collect and Return Service¹

**FREE PROCESSOR
UPGRADE &
£100 OFF** (EX.VAT)

£899 EX. DEL & VAT

£1,114 INC. DEL & VAT

*36 Month Technology Business Plan at

£40.35 P.M.* INC. DEL & VAT

E-VALUE: 004 i0306

**Ask about our upgrades to
Microsoft Office XP Small Business**



DELL POWEREDGE 1500SC

DELL POWEREDGE™ 1500SC

IMPRESSIVE PERFORMANCE AND VALUE, DELIVERING MANY HIGH-END AVAILABILITY FEATURES FOR SMALL-BUSINESS CUSTOMERS.

- INTEL PENTIUM III PROCESSOR AT 1.13GHz/133FSB (DUAL PROCESSOR CAPABLE)
- ServerWorks HE-SL Chipset
- 128MB ECC SDRAM (expandable to 4GB)
- 18GB Ultra-3 SCSI Hot Swap Hard Drive (upgradeable to 432GB Internal Storage)
- Dual channel, embedded U160 SCSI controller
- Optional RAID
- Intel Gigabit Ethernet LAN on Motherboard
- Standard hot-plug hard drives
- Optional hot-plug redundant power supplies
- 1 Year Next Business Day On-Site Support (Upgradeable to 3 Year Next Business Day Support.)

£849 EX. DEL & VAT

£1,055.15 INC. DEL & VAT

*36 Month Technology Business Plan at

£38.22 P.M.* INC. DEL & VAT

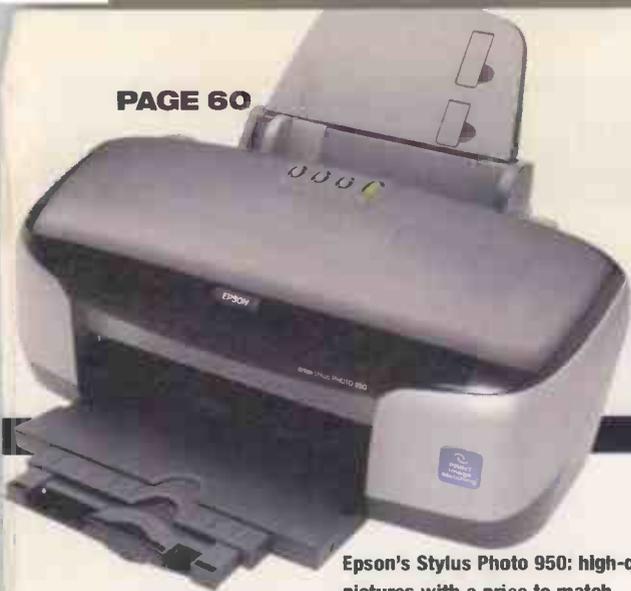


CALL 0870 907 4526

BETWEEN 8AM AND 8PM WEEKDAYS, 10AM TO 4PM SATURDAY

CLICK www.dell.co.uk

ORDER ONLINE 24 HOURS A DAY GET SPECIAL DEALS ONLINE



Epson's Stylus Photo 950: high-quality pictures with a price to match

Contents

Cover Disc

13 & 280 GSP Family Tree... Project Companion

Full versions of GSP's Family Tree genealogy software, Security and Standards' Growl II and Project Companion, as well as trial versions of Nero 5.5 and Edit Studio 3. The DVD edition includes Viewlet Builder 2 and a selection of utilities and games demos

News

17 Wifi... the new HP... broadband... organic computing

Wifi squeeze on 3G. New 64bit battlefield. The ins and outs of the new HP. Broadband latest. Special report on organic computing

Group Tests

107 Laptops for less

If you're always on the move a notebook is the ideal companion and, to show that you can buy quality kit from £938 to £1,299 we've tested 15 of the most affordable laptops around

122 Digital cameras

Get top quality images from pocket-sized cameras, without breaking the bank. We put eight leading digital camera delights through their paces

132 Table of features 133 Editor's Choice

Feature

89 DIY broadband

If you want a high-speed Internet connection, why wait for an engineer to install your ADSL connection when you can do it yourself? We investigate the current self-install services, and give you some tips on how to make the most of your ADSL link

pcwexpert

137 Windows

We all know about the most prevalent desktop operating system in the world, but where did it begin? This *pcwexpert* traces its beginnings, its evolution, and looks forward to the next upgrade. In the two workshops you will discover how to configure the XP firewall and also how to back up and restore the Registry

Competitions

270 Win Benq kit and Panda anti-virus software

Benq, the new face of Acer Communications and Multimedia, has a selection of digital cameras, a scanner and a CD-RW up for grabs. We're also giving away 50 copies of Panda Antivirus Titanium software.

Regulars

9 Editorial 10 Contact us 11 Index of advertisers 32 Inside information 35 Straight talking 36 404 not found 39 Letters 42 How we test 83 Best buys 253 Micromart 267 Buying advice 268 Special offers 284 Next issue

Leisure Lines

272 Crossword and Brainteaser 276 Flashback 277 Retro

The best affordable notebooks tried and tested

PAGE 107

Eight leading digital cameras for your perusal

PAGE 122

PAGE 89

The cheap and easy way to install your own broadband connection

EXCLUSIVE



Amari's latest PC runs at almost 3GHz

PAGE 48



Creative's MP3 jukebox

PAGE 59

Getting around

Find sections by colour

Cover Disc

News

Features

pcwexpert

Competition

Regulars

Leisure Lines

Group Test

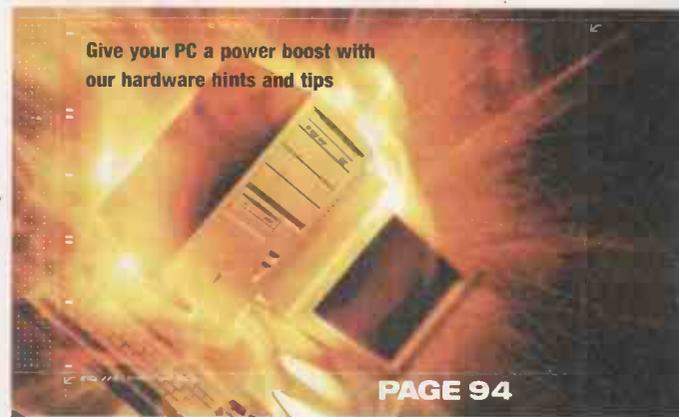
Reviews

Hands on

Cover story

94 Power boost your PC

Sluggish performance? Sudden, inexplicable crashes? Before you spend your hard-earned cash on upgrades for your PC, check out these great power-boosting tips that will cost you little or nothing. Whether it's increasing the memory or overclocking the processor or graphics chip, here are some essential tips guaranteed to fire up your PC's power



Give your PC a power boost with our hardware hints and tips

PAGE 94

Reviews

Hardware

- 46 Hi-Grade P4 Celeron desktop PC
- 47 Sony Mobile Pentium 4 notebook
- 48 Amari 2.95GHz Liquid Cool system
EXCLUSIVE!
- 51 NEC Athlon Thoroughbred notebook
EXCLUSIVE!
- Task-IT 2.4GHz PC
- 52 Dell budget P4 notebook
- Mesh value £699 PC
- 55 IBM Pentium 4 notebook

- 59 Creative MP3 jukebox
- Logitech desktop speakers
- 60 Epson inkjet printer
- 61 Lexmark inkjet printer
- 64 Brother multifunction unit
- Panasonic 3-in-1 gadget
- 66 Fujifilm digital camera
- 67 DAB digital radio PCI card

Software

- 69 Macromedia Fireworks MX
- 72 Macromedia Dreamweaver MX
- 77 Powerquest Drive Image 2002
- Pure Motion Edit Studio 3
- 78 Lycoris Desktop/LX

Peripherals

- 56 Toshiba Pocket PC
- NEC 15in flat-screen monitor

Build professional websites using Dreamweaver MX and Fireworks MX

PAGE 69



PAGE 72

Brother's MFC-590 rolls a printer, scanner, colour copier and fax machine into one



PAGE 64

Hands On

157 Contents

158 **Question Time** Your problems solved by our team of experts

165 **Workshop** Produce a professional quality DVD in part two of our workshop

168 **Windows** We find the answers to frequently asked Windows questions

174 **Windows 2000** Learn efficient partitioning with Terence Green

176 **Windows XP** Windows XP boot times, password protection and booting from a floppy

178 **Linux/Unix** How to set up Internet keyboards, and the state of Unix on Intel

184 **Hardware** Bios and dual-boot problems explained, along with the cause of a crashing problem

188 **Word Processing** Tim Nott shows you how to manipulate numbers in Word tables and modifies the word count feature

187 **Spreadsheets** Get organised with our tips on scheduling meetings and renaming files

190 **Databases** Mark Whitehorn digs deep inside the Microsoft Database Engine, and gives tips on cleaning data

192 **Sound** Immerse yourself in the world of surround-sound speakers

194 **Graphics & DTP** Ken McMahon looks at the art of rollover graphics for the web, using Imageready's new features

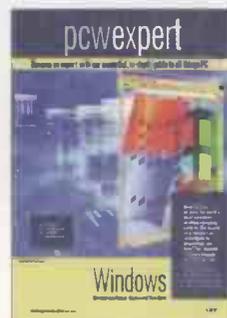
196 **3D Graphics** Benjamin Woolley looks at Maya Personal Learning Edition, and speculates on the future of Blender

199 **Visual Programming** Keep up with exchange rates with a Jbuilder and Visual Studio.Net web service

214 **Web Development** Tim Anderson explores the options that Visual Basic.Net provides for DataGrids on the web

217 **Ecommerce** Nigel Whitfield looks back on important ecommerce developments over the past two years

219 **Networks** A look at TCP/IP, IP addressing and subnetting



pcwexpert opens up the world of Windows

PAGE 137

Reader panel

Have your say as a member of the PCW reader panel and you could win a mystery prize

WIN a mystery prize!

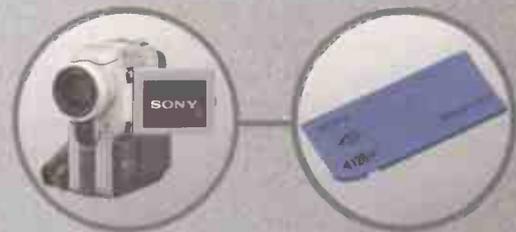
PAGE 283

Nothing remembers as clearly
as the Mega Handycam.



Mega Handycam

Sony's PC120 has a 1.55 mega pixel CCD chip. Combined with a Carl Zeiss T* lens, it gives 530 lines of horizontal resolution. It means that, besides 20/20 vision when you're shooting, you get 20/20 hindsight when you're playing back. You can also capture stills with crystal clarity, just switch to photo mode for 1,360 x 1,020 pixels of definition. Creating video mail is simple, too. Besides Memory Stick, the PC120 has Bluetooth™ technology. This enables you to send short MPEG movies and stills via a Bluetooth™ enabled mobile phone. With that kind of flexibility, what you see, and what you share, is what you'll never forget.



go create



www.sony.co.uk

Customer Information Centre 08705 111999

8MB Memory Stick supplied. Sony, Handycam and Memory Stick are registered trademarks of Sony Corporation, Japan. The BLUETOOTH trademarks are owned by Bluetooth SIG, Inc., USA.

SONY



Altered images

Dylan Armbrust explains some changes at *PCW* and laments the loss of Compaq

dylan_armbrust@vnu.co.uk

Over the past few months you may have noticed some subtle changes happening to *PCW*. We've changed our cover design with a new motto (PC advice for real life), revised the product rating structure, highlighted software included on our cover CD, and put more emphasis on the features a product offers rather than just on its technology and spec. All these changes have come about as a result of asking you, the reader, to give us your feedback on what you like about *PCW* and how we can make it a better read for everyone. This month, we're asking more readers to get involved in our reader panel (see page 283). All these changes have been part of a concerted effort to make *PCW* the most informative, cutting-edge and relevant computer magazine on the market.

And this issue is no different. This month sees the introduction of a full-fledged CD jewel case. Because so many of you like to file and store your copies of *PCW* and the CD-Roms that come with them, you've asked for something more durable and useful than the cardboard wallets that previously came with the magazine. Many of you also mentioned that you preferred a more resilient paper that could stand up to the rigours of a good thumb through and you'll see that we've responded to this as well.

Finally, we've completely overhauled our website, www.pcw.co.uk. We've updated it to bring you easier navigation, more product reviews, an enhanced downloads section, and our Eshopper buying area to help you find the products you are interested in buying online without having to spend hours searching the Internet.

We're also making it easier for you to follow up on news stories published in the

magazine as a story unfolds. You'll see that running news stories or features have a specific *PCW* number published at the bottom. All you have to do is enter the unique number in our quick search box and you'll be taken straight to the story.

More features content has made it onto the site, including our popular Retro column that looks back on the days of PC yore.

We've introduced our own Help and Advice forum so that you can ask fellow readers to get you out of a technical tight spot, or in turn share your own knowledge. There's our general Issue forum, too, where you can start your own topic thread.

While these are big changes, they won't be the only ones. Over the next few months we'll be introducing more features, such as PDA downloads and the ability to purchase and download articles in pdf form from our back issue catalogue. So I invite all of you to have a look and tell me what you think.

Less choice for consumers

There's change afoot in the wider world of IT, too. Two of the biggest computer firms in the world, HP and Compaq, have recently completed their much reported, and disputed, merger. What the overall outcome of this massive marriage will be is anyone's guess, but the first casualty appears to be the Compaq brand itself. Once rated the second largest PC manufacturer in the world, Compaq is no more.

It seems that even though the pace of computer technology is unabated, with ever faster speeds and better features attained by PCs, software and the like, our choice of who to buy them from is diminishing. Here in the UK we recently saw Tiny go into administration, only to

We've completely overhauled the *PCW* website with more news, features, downloads and extras

have its assets and brand name snapped up by Time Computers.

So that's two fewer PC firms on the market. Sure, HP will keep some of the Compaq brand alive, particularly on the consumer side of its business, and Time will be promoting the Tiny brand as a low-cost option, but the fact remains that there's now less competition out there to keep prices potentially lower and to drive innovation.

When it comes to the computer business, its one advantage is that it is constantly moving forward, pushing the boundaries of technology. If we matched the pace of car development to computers, we'd all be driving around the world close to the speed of light using cars with fusion motors. My worry is that when you get fewer, but bigger, players around, they slow down their pace of development, take the safe road and we all end up with a mediocre choice of products. Can you imagine how much worse the broadband Internet access situation would be if BT weren't forced to compete? We'd all probably still be using 33.3Kbits/sec modems paying 5p a minute in access charges.

Don't get me wrong, I'm not advocating state intervention in the affairs of computer vendors. It's survival of the fittest, especially in the world of technology. I'm just lamenting the fact that there's going to be one company instead of two, trying to push the envelope of technology and competition – seeing who can out-do the other. And on the high street we, the consumer, will have less choice when we're shopping around. I, for one, will miss the diversity. Goodbye Compaq. You gave us technology journalists a great ride, but the journey is now over. You'll be missed. Rest in peace.

PCW

PERSONAL COMPUTER WORLD

HOW TO CONTACT US

Personal Computer World, VNU House,
32-34 Broadwick Street, London W1A 2HG
Main switchboard 020 7316 9000

CUSTOMER RELATIONS

Enquiries or complaints regarding any advertiser in this magazine should initially be presented in writing to:
Anthony George, Manager,
Customer Relations Department,
at the above address.
Tel: 020 7316 9186

The opinions expressed and results published in connection with reviews and laboratory test reports carried out on computing systems and/or other related items are confined to, and are representative of, only those goods as supplied and should not be construed as a recommendation to purchase.

PCW is unable to provide technical help/support services, either written or verbal.

REPRINTS & EXTRACTS

We offer a full reprint service for reproduction of all or part of previous articles (minimum: 1,000 copies). For orders, please call Claire Childs on 020 7316 9705. We are happy for people to use quotations and segments for internal or promotional purposes. For clearance, please call Simon Haisman, Group publisher, on 020 7316 9000. For overseas licensing enquiries contact Emmy Schoorl, Business Development Manager, on +31 23 546 3792 or email e.shoorl@bp.vnu.com.

No material may be reproduced in whole or in part without written consent from the copyright holder
© VNU Business Publications 2002

FAXBACK SERVICE

If you've missed a feature, review or group test, use our Faxback Service. Dial 09065 600 632 on your fax machine, enter the code 2000 to receive a full list of the articles available.

SUBSCRIPTION AND ORDER ENQUIRIES

Tel: 01858 438 881
Fax: 01858 468 969
www.subscription.co.uk/help/vnu
Personal Computer World, Tower House, Sovereign Park,
Market Harborough, Leicestershire LE16 9EF

Annual subscription prices (inc P&P)

	CD version	DVD version
UK (inc BFPO)	£24	£39.99
Europe (inc ROI) air	£95	£105
Rest of world by air	£125	£135

FOR BACK ISSUE AND COVER DVD ORDERS

Tel: 01858 438 883
Fax: 01858 468 969
Personal Computer World, Tower House, Sovereign Park,
Market Harborough, Leicestershire LE16 9EF

UK prices (inc P&P)

Back issue (CD version)	£5
Back issue (DVD version)	£7
Cover DVD only	£2.50

Origination Westside Digital Media,
32 Great Puitney Street, London W1R 3DE
Printed and bound by St Ives (Roche) Ltd
Distributed Marketforce (UK) Ltd,
247 Tottenham Court Road, London W1P 0AU

 vnu business publications



110,453
Jan-Dec 2001

10

EDITORIAL

TEL 020 7316 9000 FAX 020 7316 9313 WWW.PCW.CO.UK

Dylan Armbrust **EDITOR** dylan_armbrust@vnu.co.uk
Nik Rawlinson **DEPUTY EDITOR** nik_rawlinson@vnu.co.uk
Clive Akass **ASSOCIATE EDITOR (NEWS)** clive_akass@vnu.co.uk
Mark Walsh **REVIEWS EDITOR** mark_walsh@vnu.co.uk
Lars-Goran Nilsson **STAFF WRITER** lars_nilsson@vnu.co.uk
Leo Waldoock **LABS WRITER** leo_waldoock@vnu.co.uk

EDITORIAL CONTRIBUTORS Tim Anderson, Mick Andon, Rob Christian, John Collins, Alistair Dabbs, Barry Fox, Roger Gann, Terence Green, Gordon Laing, Ken McMahon, Niall Magennis, Jananie Nadarajah, Tim Nott, Barry Shilliday, Stephen Wells, Mark Whitehorn, Nigel Whitfield, Benjamin Woolley

PRODUCTION

Debbie Oliver **PRODUCTION EDITOR** deborah_oliver@vnu.co.uk
Andy Stewart **DEPUTY PRODUCTION EDITOR** andrew_stewart@vnu.co.uk
Kathryn Twyford **SUB-EDITOR** kathryn_twyford@vnu.co.uk

ART

Chris Dias **ART EDITOR** chris_dias@vnu.co.uk

ART & PRODUCTION CONTRIBUTORS David Angel, Sean Barnes-Murphy, Andy Bunyan, Ciaran Bradley, Jacey, Bruce Mackie, Magictorch

PUBLISHING

Simon Haisman **GROUP PUBLISHER** simon_haisman@vnu.co.uk
Guy Phillips **PUBLISHING DIRECTOR** guy_phillips@vnu.co.uk
Ruud Bakker **CHIEF EXECUTIVE**
Brin Bucknor **MANAGING DIRECTOR**
Tosh Bruce-Morgan **FINANCIAL DIRECTOR**
Angelo Zgorelec **FOUNDER**

Marketing & Circulation

Mark Judd **HEAD OF DIRECT MARKETING AND CIRCULATION** mark_judd@vnu.co.uk
Anouska Stephenson **SUBSCRIPTIONS MANAGER** anouska_stephenson@vnu.co.uk
Sophie Flook **SUBSCRIPTIONS MARKETING EXECUTIVE** sophie_flook@vnu.co.uk
Natalie Radford **ENTERPRISE EXECUTIVE** natalie_radford@vnu.co.uk
Natalie Jarrett **DIRECT MARKETING ASSISTANT** natalie_jarrett@vnu.co.uk

Zoe Rouch **BRAND MARKETING MANAGER** zoe_rouch@vnu.co.uk
Claire Childs **SENIOR MARKETING EXECUTIVE** claire_childs@vnu.co.uk
Lucy Nebel **MARKETING EXECUTIVE** lucy_nebel@vnu.co.uk

Jonathan Hardy **NEWSTRADE CIRCULATION MANAGER** jonathan_hardy@vnu.co.uk

ADVERTISING

ADVERTISEMENT SALES HOTLINE 020 7316 9618

Matthew Tasker **HEAD OF SALES** 020 7316 9727

Tom Wright **SALES MANAGER** 020 7316 9529

Jim McGinty **ACCOUNT MANAGER** 020 7316 9295

Eugene Kerrigan **ACCOUNT HANDLER** 020 7316 9623

Andrea Hagan **ACCOUNT HANDLER** 020 7316 9342

Barney Norfolk-Smith **ACCOUNT HANDLER** 020 7316 9465

Nate Kwarteng **CLASSIFIED SALES EXECUTIVE** 020 7316 9624

Samantha Licen **ISSUE MANAGER** 020 7316 9305

US SALES REPRESENTATION Global Media USA LLC, 565 Commercial Street, 4th floor, San Francisco, CA 94111-3031, USA Tel: 001 415 249 1620 Fax: 001 415 249 1630 www.globalreps.com

EUROPEAN/ASIAN/MIDDLE EAST REPRESENTATION Global Media Europe Ltd, 32-34 Broadwick Street, London W1A 2HG Tel 020 7316 9638 Fax: 020 7316 9774 www.globalreps.com

TAIWAN SALES REPRESENTATIVES Prisco Ind. Serv. Corp, contact John Shih/May Hsieh 00 886 223 225 266

CENTRAL PRODUCTION

Joanne Hurst **PRODUCTION DIRECTOR** 020 7316 9227
Richard Briggs **PRODUCTION MANAGER** 020 7316 9483
Lisa Bonet **PRODUCTION CONTROLLER** 020 7316 9228

VNU LABS

VNU's European Labs fulfil the testing needs of VNU's portfolio of magazines. Together, the six labs across Europe in London, Amsterdam, Milan, Brussels, Paris and Madrid provide testing for all of VNU's European titles. All the Labs use the same methodology and benchmarks.

Ed Henning **DIRECTOR**

Alan Rider **OPERATIONS MANAGER**

INDEX OF ADVERTISERS

1 & 1 Internet	see advert	74-75
A		
Abit	see advert	12, 204
Acer*	see advert	68/69
AJP	020 8208 9755	112-113
Aopen	see advert	205
Asus	see advert	101, 103, 206
B		
BT	see advert	37
C		
Canon	see advert	34
Carrera*	020 8307 2900	237-240
Chaintech	see advert	207
Choice Stationery	see advert	266
Cooler Master	see advert	88
Corel	0800 581028	144
Creative	see advert	29
Crucial Technology	0800 013 7395	54
CTX Europe	see advert	76
D		
Dabs*	0870 129 3654	221-236
Dakota Computer Solutions	020 8452 8400	41
Dan Technology	020 8830 1100	14-15
Dell	01344 724 872	IFC, 86-87
DFI	see advert	208
E		
Easy Space	see advert	153
Epox	see advert	209
Epson	see advert	57
Evesham.com	0800 496 0800	70-71
F		
First4media Ltd	see advert	38
Firstech	see advert	210
G		
Giga-Byte	see advert	33, 211
H		
Hewlett-Packard	0990 474 747	62-63, 104-105
Hi-Grade Computers	0800 074 0403	49-50, 53
Host Europe	see advert	IBC
I		
Iiyama	01438 745 482	16
Intel	see advert	202-203

J		
Javelin	01254 505 505	273-275
K		
Keyzone	020 8900 1525	11
Kyocera Electronics	see advert	0BC
L		
LG Electronics	0870 607 5544	58
Legend/QDI	see advert	212
Lexington Warner	see advert	171, 181
M		
Macmin Publishing	07000 120 012	198
Me 2 U	see advert	116
Mesh Computers	020 8208 4706	21-25, 154
Microwarehouse	see advert	65, 127-129
Morgan Computers	see advert	187
MSI	see advert	213
MX2	see advert	164
N		
NEC	see advert	43
Netgear	see advert	136
Nethighstreet.com	see advert	130
P		
PC World	0990 464 464	79-82
Philips	see advert	31
Power Computing	see advert	278-279
Poweroid	0870 220 0444	134-135
Q		
QDI	01753 554 004	106
R		
Red Hat	see advert	153
S		
Simply Computers	0800 035 2120	115
Sony	see advert	8
Special Reserves	01279 321 321	156
T		
Time Computers	0870 8303 101	172-173, 182-183
Time Professional Systems	0870 8303 127	149-151
Tiny	0870 8303 161	162-163
Toshiba	see advert	121
W		
Watford Electronics*	0800 781 1010	241-252

* Inserted cards, catalogues, pre-printed adverts and sections



Total Server Management
www.keyzone.com

**RACKS
CABINETS
CONSOLE
FURNITURE
KVM SWITCHES
KVM EXTENDERS**

Keyzone Computer Products Ltd.

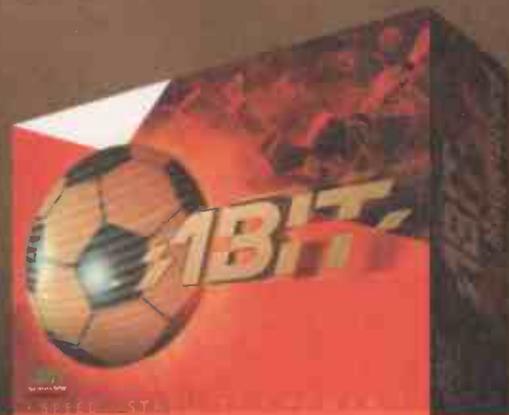
Tel: 020 8900 1525
Fax: 020 8903 1486
sales@keyzone.com

LOVE FOOTBALL?



So do we.

Time is precious, especially during World Cup season. At ABIT, we always try to make the best motherboards. After all, a motherboard with stability and performance will give you more time to watch football.



Where to buy--

Dabs.Com
www.dabs.com

E-Buyer
www.ebuyer.com

Insight
www.insight.com/uk

Micro Direct
www.microdirect.co.uk

Novatech
www.novatech.co.uk

Overclocks
www.overclocks.co.uk

Planet Micro
www.planetmicro.co.uk

Protege Systems & Components
www.protege-systems.co.uk

Redstore.Com
www.redstore.com

Simply
www.simply.co.uk

Scan Computers
www.scan.co.uk

Watford Electronics
www.watford.co.uk

July

COVER DISC



Turn to p280 for more info >

Here's a taster of what's on the cover disc – turn to the pages at the back of the issue for details

Full versions

GSP Family Tree

GSP's genealogy software will speed your ancestral research by helping to organise data. Using this package you can produce high-quality, professional-looking family trees. Features include: research facility, 'Tree Detective', new tree styles, individual record sheets, picture compatibility and links to popular UK genealogy websites.

Security & Standards Growl II

Is the website you're visiting legal and secure? Which trade associations and merchant agreements (credit cards) really are connected to the site? Is the site actually a clone of the real thing? Security and Standards' Growl offers a simple 'traffic light' system indicating the level of security in place at any website you visit.

Project Companion

Project Companion is a valuable, yet free-of-charge, source of hints, techniques and terminology for Microsoft Project users. The 26 topics within Project Companion have been chosen to illustrate best practices in applying Microsoft Project to a real environment – working on real projects.

Turn to p280 >

Trial versions

Nero 5.5

Nero is a solution to all your CD recording needs. And now, version 5.5 has full support for recording both data and video DVDs. Nero can create or copy virtually any CD or DVD. Whether you want to back up your hard drive or compile collections of your favourite music, Nero 5.5 can cope.

Edit Studio 3

Capture clips from a digital video or analogue capture card and arrange them using Edit Studio, or apply transitions, titles and effects. Then build the movie to a file, send it to your camcorder or put it on a website. Edit Studio can edit movies in timeline and storyboard modes. Many items, effects and transitions can be layered, giving total control.

WinOn CD 5 Power Edition

This multimedia software tool lets you create your own projects with music, video and photos – now sporting a more user-friendly interface. Edit music and create video CDs, DVDs, backups and copies. Includes Roxio DirectCD, CD Emulator, CheckCD, Video CD Player, VCD Photo Album, VCD Music Album and MP3 Project.

Turn to p281 >

Powerstrip

Powerstrip provides a pop-up menu providing access to 500 controls over your display hardware, including sophisticated colour correction tools.

Turn to p281 >

On the DVD

There's everything that's on the CD-Rom, plus all the following on this month's DVD-Rom.

Viewlet Builder 2

Viewlet Builder is the powerful, yet simple tool for creating Viewlets – compact animated movie files. The enhanced features of this Freeware Edition are a great introduction.

Mandrake Linux 8.2

Mandrake Linux is a preconfigured graphical Linux operating system. It's easy to install, use and is stable. We featured version 8 on last July's DVD-Rom, and it also received PCW's Editor's Choice award.

Plus...

Essentials – more than 50 utilities and add-ins; group tests; shareware and freeware and games demos, including 2002 FIFA World Cup, Beam Breakers, The Secret of Nautilus, Universal Monsters, Blood Omen 2 (trailer) and Freedom Force.

Turn to p282 >

Using the cover disc

The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 4 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

Starting the disc

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or run pcw.exe on the root of the disc.

Problems?

Please note that we cannot give support on individual programs contained on this disc. If you have problems running the disc or any of its content, please note these guidelines:

FAULTY DISC > If the disc is physically damaged and will not load, return it to this address for a replacement:
PCW July cover disc
ABT, 306 St Mary's Lane
Upminster, Essex RM14 3HL

quoting reference 'PCW Vol 25 No 7'.

PROBLEMS INSTALLING/RUNNING THE SOFTWARE >

Check the support page on the disc, or check the manufacturer's site.

GENERAL DIFFICULTIES > Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or email us at pcw@vnusupport.co.uk.



Award winning Dan

CHALLENGER
RANGE FROM
£29.99
PER MONTH**



Dan Challenger 1000*

- Celeron™ 1.1GHz Intel® Processor
- 256MB SDRAM
- GeForce 4MX 64MB DDRTV/Out
- 17" Philips Monitor
- 40GB Hard Drive
- Midi Tower Case
- 56K Fax/Modem
- DVD ROM
- Dan Advanced Speakers
- Sound Blaster Live 5.1 OEM
- Windows XP Home Edition
- Upgrade with Dan EPOA

ONLY QUALITY COMPONENTS

£699.00

inc. VAT £821.33

36 months @ £29.99 per month inc. delivery & VAT



Dan Challenger 2000

- Pentium® III 1GHz Intel® Processor
- 256MB SDRAM
- GeForce 4MX 64MB DDRTV/Out
- 17" Philips Monitor
- 40GB Hard Drive
- Midi Tower Case
- 56K Fax Modem
- DVD ROM 16 Drive + SofDVD
- Dan Advanced Speakers
- Sound Blaster Live 5.1 OEM
- Windows XP Home Edition
- Upgrade with Dan EPOA

ONLY QUALITY COMPONENTS

£839.00

inc. VAT £985.83

36 months @ £36.10 per month inc. delivery & VAT



Dan Challenger 4000

- Pentium® 4 1.9GHz Intel® Processor
- 256MB SDRAM
- GeForce II MX400 64MB
- 17" Philips Monitor
- 40GB Hard Drive
- Midi Tower Case
- 56K Fax Modem
- DVD ROM 16 Drive + SofDVD
- Dan Advanced Speakers
- Sound Blaster Live 5.1 OEM
- Windows XP Home Edition
- Upgrade with Dan EPOA

NOW ONLY
£899.00
£1056.35 inc. VAT

~~£1099.00~~

inc. VAT £1291.33

36 months @ £38.59 per month inc. delivery & VAT



No.1
for quality & service within the industry

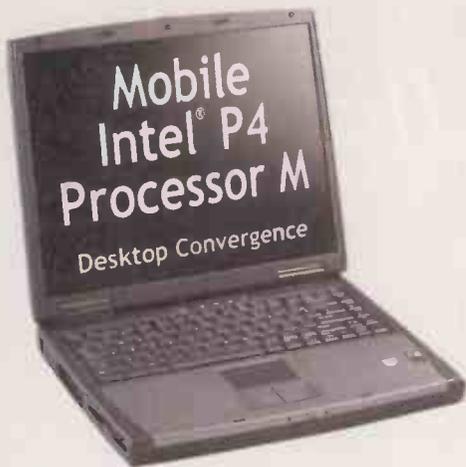
CALL
0870 4447020

web: www.dan.co.uk e-mail: sales@dan.co.uk fax: 020 8830 1122

TYPICAL EXAMPLE: Total Cash Price (inc. VAT and Delivery) £1000.00 with a 10% deposit of £100.00 payable. No more to pay for 6 months, then either settle the balance of £900.00 before the first calculated from the day you sign the credit agreement). Written quotations are available on request. Credit is subject to status. Prices and specification are correct at date of publication, but subject to availability or change without notice. Pictures for illustration purposes only. Dan's terms and *Home installation and delivery available at additional charge. Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron and SpeedStep are trademarks

@ unbeatable prices

**6 MONTHS
INTEREST
FREE
CREDIT**
option available



Dan Voyager 4000

- Pentium® 4 1.6GHz M Mobile Intel® Processor
 - 256MB DDR RAM
 - nVidia GeForce II GO 4x Graphics Card with 16MB DDR Memory
 - 15" SXGA Colour Screen
 - Onboard LAN/Fax Modem
 - 20GB Hard Drive
 - 8x DVD ROM Drive + SofDVD
 - Windows XP Professional
 - Carry Case
- Call for full Voyager Range

£1399.00

inc. VAT £1643.83



36 months @ £59.29 per month inc. delivery & VAT



Dan Voyager 1000

- Celeron® 1GHz M Mobile Intel® Processor
 - 128MB RAM
 - Onboard 830MG Graphics Card SMA
 - 14" XGA Colour Screen
 - Onboard LAN/Fax Modem
 - CD ROM Drive
 - 20GB Hard Drive
 - 2x PCMCIA
 - Windows XP Professional
 - Carry Case
- Call for full Voyager Range

£1029.00

inc. VAT £1209.08



36 months @ £42.44 per month inc. delivery & VAT



NEW PHILIPS LCD Monitors

- 150B3y
- 15-inch Colour LCD Monitor with Excellent Display Performance
- Standard VGA Analog Input
- Embedded Universal AC Power Supply
- Adjustable Tilt and Swivel
- AUTO Adjustment Optimizes Picture Quality
- User Installable Bezel for Optional Protective Cover Choice
- Optional USB Hub

£299.00

inc. VAT £351.33



CLICK

www.dan.co.uk

tel: 0870 444 7020 e-mail: sales@dan.co.uk fax: 020 8830 1122

payment due date and incur no interest charges OR make 36 monthly payments of £35.23, total amount payable (including deposit) £1533.16. APR 19.9% (interest is and available only to persons aged 18 years or over. Dan Technology Ltd. Ironbridge Close, Great Central Way, London NW10 0NW. conditions of Sales and Service apply and are available on request and at www.dan.co.uk. *Third party products are covered by third party manufactures warranty. E & O.E. of Intel Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation.

No.1
for quality
& service
within the
industry

the **ii**mmaculate
conception

introducing the **NEW**
iiyama LCD range...

Home or office? Novice or power user?
Whatever your needs, iiyama has the
solution. Our LCD range combines
image quality with reliability, and
features with flair.

Speakers, DVI and a rotating screen?
Or perhaps you're turned on by our innovative
styling? From 15" to 19", in standard or black,
they look every bit as good as they perform.

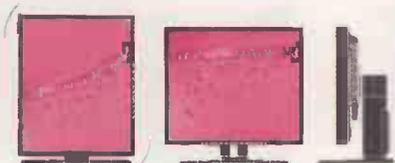
Prices from **£299 + VAT**.

Available features:

DVI-I interface | height adjustment | rotating screen | USB | audio | sRGB | kensington lock | ultra wide viewing angles
16 million colours | three years on-site warranty | TCO compliancy | slim bezel design for multiple tiling | S-Video | free mount design

www.iiyama.co.uk

01438 745482



iiyama
quality | value | support

NEWS

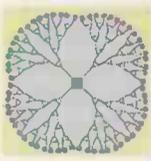
CLIVE AKASS REPORTS

Contents

NEWS

- 18 AMD opens new 64bit front
The ins and outs of the new HP
- 19 BT's micropayments plan
- 20 Holo drive prototyped
- 28 DIY starts rush for broadband
- 29 Satellites fill gaps
- 30 Xbox losing console war
Microsoft skeletons rattle

SPECIAL REPORT



This dendrimer and other exotic carbon-based molecules could lead to spray-on circuits and

screens. It's early days yet but you can start thinking about flexible screens, dynamic wallpaper and, er, high-resolution cyberskin. Just don't ask where that may lead. Clive Akass writes on the emerging world of organic logic in a two-page report starting on page 26.

Freerise cable

NTL is to sell cable broadband access via Freerise, it announced as we went to press. See also page 28



Portable screens turn over a new leaf

You may have read about the idea in *PCW*, well here's one implementation of the reality. Samsung SDI spent more than £1m developing this 6.7 x 5in screen that folds along the middle and is designed for ebooks. It goes into production later this year. Dual screen: page 19; flexi screens: page 26

Wifi hotspots threaten 3G billions

BT plans to launch fast Wifi access at airports, shopping centres and cafes in a move that could undermine the financial viability of 3G (third generation) links – giving operators (including BT) less chance of recouping the £24b they paid for 3G licences.

The rollout of 400 Wifi 'hotspots' later this year is nowhere near big enough to dent cellular revenues. But in parts of the US Wifi hotspots have spread out to cover districts, and enthusiasts expect them to eventually cover entire cities.

Ironically the announcement by BT Retail came only days before the

lavish launch of BT's demerged cellular arm MMO₂.

Wifi (802.11b) links are rated at 10Mbps/sec, with real transfer rates at around half that. BT is expected to offer 2Mbps/sec – still five times faster than predicted 3G speeds.

There would be huge problems in scaling up Wifi to cover cities. Billing under the BT Retail system is simply a matter of prepaying for a day's access at one site; charging for roaming access, where you may cut across many network nodes, would be far more complex. But it could provide new revenue streams.

In one scenario all home and

office broadband access boxes would pack public wireless access and would be subsidised by public data revenues.

Wifi as it stands could not cope with such user densities. It has only three non-overlapping channels and there are already crowding problems (*PCW* number 1131203). Wifi devices in effect shout to their maximum range, limiting the number of possible users in an area.

European amendments to 802.11a (aka Wifi5), which is 10 times faster than 11b, ease these problems by matching power to current needs and dynamically selecting frequencies to minimise contention. The standard, which also offers more channels than Wifi, is still going through its European approvals process.

In any event 3G access, which is probably at least two years away, is going to face competition from wireless links up to 50 times faster in the very cities where operators hoped to recoup their vast investments.

The issue is not so much whether 3G looks dated before it is born, but whether the thinking and regulatory structures that produced it are stuck in the past.

There are moves for a more coherent, holistic approach to matching available bandwidth and transmission systems to needs (see my *PCW* predecessor Guy Kewney's site at www.newswireless.net).

Clive Akass

Numbers are up for new-look *PCW* site

You will see references to *PCW* numbers at the foot of some stories in this month's News section. These will save you work if you want to find out more information on the story from a source, or a fuller version, in the online database powering our new-look site at www.pcw.co.uk.

Rather than get you to type out a long complicated web address

we have put a little box at the top left of the screen (see left). All you need to do is to type in

the number and click Go. This feature and the new look are only part of the revamp story. We want to improve the integration between

the printed *PCW* and the site, to bring you timely news and views to a degree that is not possible in a printed monthly title.

We also want this to be *your* site; somewhere where you can give us feedback, discuss issues with other readers, and find advice and answers to your computing problems. Like all publishing houses, our parent company VNU has had to tread a tricky line with its online media. A major issue has been whether to focus resources on a central site, or risk dissipating them by pushing individual magazine sites.

For some time the *PCW* site has been a satellite of the much larger

VNU one. The advantage was that you got access to features and news you may have missed in our sister publications. The disadvantage was that the site became distanced from the magazine and to an extent from you, the reader.

This has now changed and we hope to bring you the best of both worlds, acting as a window on all VNU resources while retaining our unique *PCW* perspective.

We are not trying to do everything at once and you will see changes and new features at our site over the coming months. If there is a feature you would like to see, tell us about it. We want the site to work for you.

Enter PCW article number here

Go

Short stories



HANDS-FREE HEADSETS

Phone-packing PDAs are likely to increase the use of hands-free headsets which, for those lacking Bluetooth, involves wires hanging from your ears. The snag is that you can look like a maniac walking along, talking to thin air, flourishing your liberated hands to stress a point.

The answer (*writes PCW's fashion correspondent*) is to have a headset that is at once elegant and visible, an unspoken statement of your sanity and dynamism. So argues Jabra, which has introduced a new range into Britain. The £19.99 Earwrap, pictured above, is one of them. www.jabra.com

360GB DRIVES

Fujitsu says it is on course to make 360GB 2.5in drives within four years, after achieving a record-breaking data density of 300Gbits per square inch. www.fujitsu-europe.com

THEME MACHINE

A £10 Theme Manager from BVRP Software allows you to change features such as the desktop background image and text colour on organisers running Pocket PC 2002.

JUST THE JOB

Fancy being a BBC governor, or helping to run your local school? A new website at www.justdosomething.net has been set up to point volunteers to more than 36,000 public appointments.

AMD opens a second 64bit front

AMD has announced names for its soon-to-be-launched 64bit eighth-generation x86 processors – and opened up a new 64bit front challenging Intel's Xscale processors in the handheld market.

AMD's enterprise-class x86-64 chips, codenamed Sledgehammer, will be branded Opteron, meaning 'the best', when they launch early next year. They will use the next-generation Hypertransport bus.

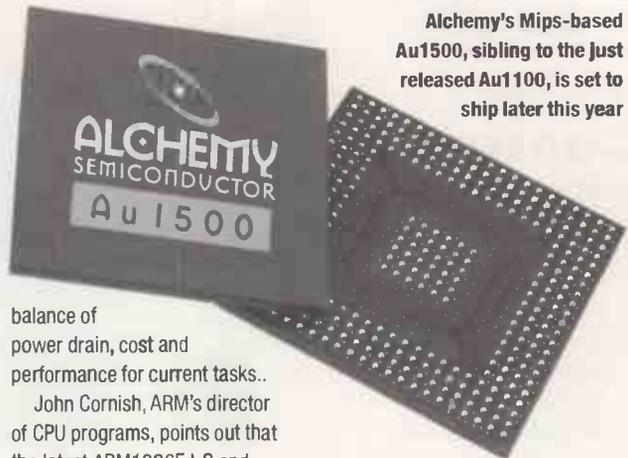
Their desktop-class siblings, codenamed Clawhammer, will be branded 'eighth-generation Athlon' and are set to ship late this year.

Both lines are designed to compete with Intel's 64bit Itanium and high-end P4s. AMD says the fact that its products run both 32bit and 64bit x86 apps natively provides a smoother upgrade path than Itanium, which can run x86 code only in emulation mode.

Meanwhile AMD's purchase of a company called Alchemy has given it a foothold in the handheld market. Alchemy specialises in chips using Mips core logic, a rival to the ARM cores used by Xscale.

AMD has launched Alchemy's latest Au1100 system-on-a-chip, designed for handhelds and webpads but based, like Xscale, on a 32bit architecture. But it says it will also build handheld processors using Mips' 64bit architecture.

Mips has been developing 64bit designs for 10 years. ARM argues that 32/16bit chips offer the best



Alchemy's Mips-based Au1500, sibling to the just released Au1100, is set to ship later this year

balance of power drain, cost and performance for current tasks..

John Cornish, ARM's director of CPU programs, points out that the latest ARM1026EJ-S and next-generation ARM11 have a 64bit memory bus 'to deliver high bandwidth and performance without the power and cost penalties of a full 64bit processor.'

The ARM1026EJ also packs ARM's fast Jazelle Java engine, which Cornish cites as another example of how ARM adds features selectively to optimise performance. These arguments, whatever their

merits, may go unheard if AMD-powered 64bit handhelds go head-to-head with 32bit ARMs. It would be ironic if buyers assume 64bit is better than 32bit, as AMD has been foremost in arguing that simple metrics like this are a poor measure of processing power.

● AMD will phase out its Duron range by the end of this year, chairman Jerry Sanders has said.

BANIAS IS BORN AMID NEW MOBILE LAUNCHES

Intel has made a prototype of the chip codenamed Baniyas, its first x86 processor designed from scratch for mobiles.

It will launch next year with the Odem chipset and will pack support for Wifi networking. The news came amid a flurry of new releases from Intel,

including 1.4GHz, 1.5GHz, 1.8GHz versions of the mobile P4, and two low-voltage, low-drain mobile PIII processors clocking 800MHz and 933MHz. Also launched were 2.53GHz and 2.4GHz versions of the P4 desktop processor (see reviews pages 48 and 51).

In and outs of the HP-Compaq merger

Several product lines are to disappear with the absorption of Compaq into HP, in the largest merger in history. Compaq was itself swollen by recent mergers with enterprise systems specialist Tandem and the huge Digital Corporation.

The deal will cost an estimated 15,000 jobs worldwide, but it was not known how many of these would be in Britain. The Compaq name will survive as a brand in product areas where it is considered dominant.

One surprise is the fate of HP's Omnibook brand, which has been erratic over the years but had

occasional flashes of brilliance – early models were among the first to recognise that people actually wanted notebooks to be portable. It is to be phased out in favour of Compaq models which have hardly covered themselves in glory.

More understandable is the dropping of the Jornada handhelds in favour of Compaq's highly successful Ipaq range.

HP, which co-developed the 64bit Itanium with Intel, will still launch the next generation of Compaq's 64bit Alpha processor, according to US reports. But the company will

focus on moving its high-end server lines to the Itanium.

Both HP and Compaq brands will continue on home PCs, but Compaq technology will dominate in business PCs and high-end servers. The HP brand will be used for printers.

Carly Fiorina remains as HP's chief executive and Michael Capella, her opposite number as Compaq's former chief executive, becomes president. Fiorina said the enlarged company would invest \$4b a year in research and development and cut operating expenses to total 17 per cent of revenues at most.

See Mark Walsh page 44.

BT lets you spend a penny online

BT has become the second phone company to launch a scheme to enable users to spend small sums on the web – which could be vital if ecommerce is to go fully mainstream.

Micropayment systems have been around for some time, but none has come close to being accepted as general currency. Credit-card transaction costs are too high to allow their use as small change.

Now BT has adopted a 'click and buy' system, run by the German firm Firstgate, which debits small sums from your bank account. Later you will have the option to have the charge added to your phone bill.

First you have to set up a free account with BT's micropayments service, giving your bank or credit-card details. You'll then get a password and user number. Then simply click on the BT logo on participating sites to make a payment.

Ian Price, head of micropayments at BT, admits that the password

system can get dodgy if user numbers get into the millions as the chance of hitting a valid combination at random goes up. However, the system is primed to spot repeat tries and eventually authentication certificates will be introduced.

He said BT had looked at 'wallet' systems in which you can spend up to a pre-paid amount. 'The problem is that a customer who doesn't have enough in the wallet tends to move off without purchasing. Our system

is post-payment, which allows you to spend up to your credit limit.'

The system will go live in September. Vodafone already has a system called m-Pay that allows users to spend as little as 5p at participating sites; the charge is added to their mobile phone bill.

Price says only a tiny commission will be charged per transaction. However, BT's partner Firstgate is said to charge up to a 40 per cent commission on sales in Germany.

Touching story of rubber phones

A vibrating rubber mobile phone allows people to transmit ideas, thoughts and feelings to each other, claim researchers at the Tangible Media Lab at the Massachusetts Institute of Technology.

They claim touch allows for more personal communication, and could enable remote communication for the deaf. Their prototype phones have five tiny finger pads that react

to the amount of pressure applied on them. The harder a caller squeezes, the more the corresponding pad on the other phone vibrates.

During testing, users are said to have come up with ad hoc codes to interrupt, agree with or sympathise with the other speaker. At the very least it is a novel way of keeping in touch.

PCW number 1131304

NOTEBOOK THAT SEES DOUBLE

Folding screens are usually seen as a way of getting a notebook-class display onto a pocketable device, such as that pictured on page 17. The idea behind this model from US-based Estari is rather different. It is, as you can see, more dual-screen than folder and is far from pocketable.

The 2-VU notebook's twin 15in displays allow users to page through two ebooks at once, or view two consecutive pages like a paper book, or read one book with one screen while taking notes in another.

Estari plans handheld and 'portable desktop' versions. The XP-based 2-VU comes with document-management software, which is an Estari speciality.



The model will ship in the US this year but prices have yet to be announced. www.dualscreen.com

Surfers full of Eastern promises

A spate of web virtual 'marriages' has prompted Chinese gossips to see red. The nuptials have no basis in law but are causing real marriages to founder, Chinese newspapers report.

One woman divorced her real husband because of his virtual polygamy, and a childless woman hit the headlines when her husband's net 'wife' had a virtual 'baby'.

Some men are thought to have seven or eight 'wives' on the Internet. Others have bequeathed

property to their web spouses rather than their real-life families.

Some newspapers have called on the government to act, claiming that the situation has got out of hand. One editorial thundered: 'While reports of westerners having Internet affairs is not new, it is part of Chinese culture that marriage seems to be a part of the fantasy.'

Presumably Chinese women are also having bigamous web marriages but the editorials only complain about men. **Nick Farrell**



'Confucius he say: Chinese man with eight virtual wives no worse than British man with one PC widow'

Short stories



CAMERA PRICES DROP

In yet another sign that the price of digital cameras is falling, HP is selling this 1 megapixel point-and-shoot camera for £99. The PhotoSmart 120 boasts 4MB of Ram and a 3.6cm LCD screen. In addition to taking stills it can shoot 35 seconds of video.

STRANGE TRUST

Two out of three people passing through Victoria Station gave complete strangers their network password when asked for a survey by the organisers of Infosecurity Europe 2002.

CRAWLING HACK

Columbia University researchers have created a virtual reporter that trawls the web for stories, then edits and rewrites them. They say the Newsblaster software will not replace human reporters because it makes too many mistakes – but it could be used to aggregate stories on the web. PCW number 1130816

SUPERCOMPUTER CROWN

NEC is claiming the title for the fastest-ever supercomputer with a machine called an Earth Simulator that runs at 36,500 Gigaflops – three times more powerful than IBM's best.

The machine at the Yokohama Institute for Earth Sciences covers a floor space as large as a football field. It is capable of running global simulations across its 5,104 purpose-built processors and can pinpoint patterns that were previously invisible to meteorologists.

PCW number 1131130

Short stories

LOTS OF TROUBLE

Half of all web fraud involves online auctions, says a report from the US Internet Fraud Complaint Center. Nearly one in four auction complaints were about non-delivery and non-payment. The figures may have been distorted by the fact that Ebay, the largest online auction site, shares information with law enforcement agencies.

The next biggest scam is the 'Nigerian letter', promising large sums of cash in return for bank details. It sparked one in six complaints and cost victims an average \$5,575 (£3,880).

PCW number 1130837

PIRATES BEWARE

A bill to increase the maximum penalty for software piracy from two to 10 years has passed its Third Reading in the Commons and is expected to become law this year.

STORAGE CUBED

IBM has developed a cube-shaped storage system that can be stacked like Lego blocks to provide 32 terabytes of storage. Each cube holds 12 100GB hard drives (totalling 1.2TB), plus 1GB of Ram, and an Intel processor. They can be stacked in a block of up to 27. A water pipe runs between each layer offering quiet cooling without a fan.

PCW number 1131263

RAM 'CARTEL'

Some memory vendors have done deals to inflate prices, claims Dell chief Michael Dell. 'I think we saw cartel-like behaviour by a couple of D-Ram suppliers,' he said. 'It appears to have been successful for a very short period of time.'

Memory prices have more than tripled since November, but have begun to fall again. Dell said he would diversify his suppliers to protect prices.

PCW number 1131415

Holo gigadrives 'ship in two years'

Holographic storage offering capacities at least 20 times greater than today's DVDs could be available within two years, developers say. A prototype drive called Tapestry, storing 100GB on a CD-size disc was demonstrated last month by Inphase Technologies, a company formed in 2000 to exploit developments at Lucent's Bell Laboratories. A major shareholder is storage media giant Imation.

Inphase has developed a new type of photo-polymer for the recording layer and is claiming transfer rates of 20Mbytes/sec. The technology depends on low-cost robust red and blue lasers developed for DVD and Blu-Ray recorders. The product will be targeted at the professional market, with drives costing up to \$10,000 (approx £7,000 – about the same as early DVD recorders) and 100GB discs at \$50 (£35) each. Disc capacities will eventually go into the terabytes, the company says.

Inphase strategic marketing director Chris Pfaff said: A 'prosumer/consumer device' could appear within three to four years and that the technology will surpass Blu-Ray, itself seen as the next-generation DVD.

Meanwhile a Cambridge company called Polight says it



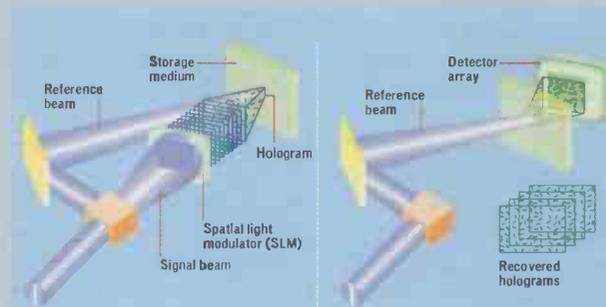
Tapestry – the prototype drive

Klez revives threat from vicious old viruses

Dangerous variants of the Klez virus that swept the world last month were still appearing as we went to press. They consisted of a cocktail of Klez and other, older viruses to which they are giving a new lease of life.

Klez essentially offers a delivery system for other viruses, including

HOW HOLOGRAPHIC STORAGE WORKS



The data to be stored is split into 'pages' consisting of an array of 0s and 1s. Each page is passed to a spatial light modulator (SLM) that translates it into an array of 1.3 million pixels that pass or block light according to bit value.

A prism splits light from a coherent laser source into two beams, called the reference and signal beams. The signal beam passes through the SLM and emerges patterned with the data.

The two beams intersect to produce an interference pattern – the hologram – which is

recorded, as shown in the left half of the diagram. The data is read (see right diagram) by passing a reference beam through this pattern onto a detector array.

Inphase claims this simultaneous readout of 1.3Mbit blocks can result in transfer rates of hundreds of megabytes per second. Massive data densities can be achieved because many pages can be stored in the same micro-block of the recording medium by varying the wavelength or angle of the reference beam.

is on schedule to produce 500GB holographic discs by 2004 using a special glass called Holonide which it says has advantages over the Inphase polymer.

Chief executive Michael Ledzion explained: 'Polymers tend to shrink under the influence of a laser. This can cause problems if you are storing a lot of data in the same volume (a feature of holographic storage – see diagram above) because your second write pulse can distort the image of the first. This does not happen with Holonides.'

Holographic drives are harder to make than DVD drives because of the need to vary the angle or wavelength of the laser to gain maximum storage capacities (see explanation above). But Polight is not in the business of making drives. Instead, said Ledzion, it designs media to a 'generic specification' around which manufacturers can build drives. And initially they will use cheaper green pulse lasers. Drives will be targeted at the corporate archive market.

www.inphase-technologies.com
www.polight-technologies.com

an update of the very nasty CIH virus, which can destroy the Bios on a machine as well as the boot sector on a hard drive, making data recovery very difficult or impossible – and even, in extreme cases, writing off entire PCs.

Costin Ionescu, a researcher at anti-virus firm Bit Defender, said:

'Older and even forgotten viruses like CIH or MTX now have a modern means of transportation.

'The mix is very strong and could pass through an ordinary virus checker without being detected as what it really is: a very destructive transformation of a virus.'

PCW number 1131458

View our No.1 range. Find your No.1 solution.

Buy with confidence from the Best PC Manufacturer of 2001, as awarded by PCW.

No.1 Value PC or Intel Budget PC
for **£599** *EXC.*

No.1 Award Winning PCs
from **£899** *EXC.*

No.1 Power PC
for **£999** *EXC.*

No.1 Notebook
for **£1099** *EXC.*



www.meshcomputers.com

More awards from the IT press
than anyone else over the past 3 years!

MESH
computers plc



A new kind of fast

No.1 Value PC for £599 EXC.

PC2GO

Ready to ship PC
Built, Configured &
tested for 72 hours



0% Finance available
For finance customers
delivery is 72 hours from
receipt of signed forms.

Excellent Quality - Unbeatable Value

Matrix XP 1800+ nFORCE



AMD Athlon™ XP 1800+ with QuantiSpeed™ Technology

256MB High Performance DDR memory

40GB UDMA-100 HD

17" Digital .27mm (16" VIS) - Upgrade to 15" TFT £180 +VAT

Integrated 64MB nVIDIA GeForce2 graphics

16x DVD-ROM

Onboard 4 channel sound

Stereo amplified 80W (PMPO) speakers

56Kbps V90 voice/fax/data modem

MESH 3 Year On-site Warranty†

Lotus SmartSuite (latest edition)

Plus Standard Features (see right)

£599 £703.83 inc.VAT

- Upgrade to XP 1900+ processor £15 £17.63 inc.
- CDRW 40x12x48 with buffer £70 £82.25 inc.
- 40GB (7200rpm) with 2MB buffer HD £10 £11.75 inc.
- 60GB (7200rpm) with 2MB buffer HD £25 £29.38 inc.

Matrix Range Standard Features

- Tower Case with tool free access
- 4 USB Ports
- 1.44MB 3 1/2" floppy disk drive
- Microsoft internet keyboard and Intellimouse with mouse pad (unless otherwise stated)
- Virgin.net Internet & E-mail Access
- Microsoft Windows XP (Recovery CD)
- Microsoft Internet Explorer (v.6.0)
- DVD includes decoding software
- CDRW includes burning software

MESH PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

Lotus SmartSuite (latest Edition)



Award-winning Lotus SmartSuite Includes:
• Word Pro
• 1-2-3
• Freelance Graphics
• Approach
• SmartCenter
• Organiser
• FastSite

MESH Matrix XP Range



*Finance available on all systems

Matrix XP 1800+ EL



• Processor	AMD Athlon™ XP 1800+ with QuantiSpeed™
• Motherboard	ASUS A7V333 technology (supports 333MHz & USB 2.0)
• Memory	256MB High Performance DDR
• Hard Drive	40GB UDMA-133 (7200rpm) with 2MB buffer
• Monitor	17" Digital .27mm (16" VIS) - Upgrade to 15" TFT £180 +VAT
• Graphics	64MB nVIDIA GeForce4 MX440 with TV out
• Multimedia	16x DVD-ROM
• Storage	Upgrade Option
• Sound Card	SoundBlaster 5.1 audio with Dolby Surround (OEM)
• Speakers	Creative Labs Four Point Surround
• Modem	56Kbps V90 voice/fax/data
• Warranty	MESH 3 Year On-site Warranty†
• Software	Lotus SmartSuite (latest edition) Plus Standard Features (see above)

£699 £821.33 inc.VAT

Leading value upgrade options	Upgrade the Matrix XP 1800+ EL	exc.	inc.VAT
	• Athlon™ XP 1900+	£15	£17.63
	• 60GB UDMA-133 (7200rpm)	£15	£17.63
	• CDRW (40x12x48) with buffer	£70	£82.25

Matrix XP 1900+ MR



• Processor	AMD Athlon™ XP 1900+ with QuantiSpeed™
• Motherboard	ASUS A7V333 technology (supports 333MHz & USB 2.0)
• Memory	256MB High Performance DDR
• Hard Drive	60GB UDMA-133 (7200rpm) with 2MB buffer
• Monitor	17" Digital .26mm (16" VIS) - Upgrade to 15" TFT £180 +VAT
• Graphics	64MB nVIDIA GeForce4 MX440 with TV out
• Multimedia	16x DVD-ROM
• Storage	CDRW (40x12x48) with buffer
• Sound Card	SoundBlaster 5.1 audio with Dolby Surround (OEM)
• Speakers	Creative Labs Four Point Surround
• Modem	56Kbps V90 voice/fax/data
• Warranty	MESH 3 Year On-site Warranty†
• Software	Lotus SmartSuite (latest edition) Plus Standard Features (see above)

£799 £938.83 inc.VAT

Upgrade the Matrix XP 1900+ MR	exc.	inc.VAT
• Athlon™ XP 2000+	£25	£29.38
• 512MB DDR memory	£70	£82.25
• 19" Digital .26mm monitor	£50	£58.75
• 64MB GeForce4 - Ti 4200	£75	£88.13
• SB Audigy+ 1394 & 5.1 speakers	£50	£58.75

Matrix XP 2000+ GF4200



• Processor	AMD Athlon™ XP 2000+ with QuantiSpeed™
• Motherboard	ASUS A7V333 technology (supports 333MHz & USB 2.0)
• Memory	512MB High Performance DDR
• Hard Drive	60GB UDMA-133 (7200rpm) with 2MB buffer
• Monitor	19" Digital .26mm (18" VIS) - Upgrade to 15" TFT £130 +VAT
• Graphics	64MB nVIDIA GeForce4 - Ti 4200 - TV out & DVI
• Multimedia	16x DVD-ROM
• Storage	CDRW (40x12x48) with buffer
• Sound Card	SoundBlaster Audigy with 1394 FireWire port
• Speakers	Creative Labs Inspire 5300- 5 Point Surround
• Modem	56Kbps V90 voice/fax/data
• Warranty	MESH 3 Year On-site Warranty†
• Software	Lotus SmartSuite (latest edition) Plus Standard Features (see above)

£1069 £1256.08 inc.VAT

Upgrade the Matrix XP 2000+ GF4200	exc.	inc.VAT
• Athlon™ XP 2100+	£30	£35.25
• 80GB UDMA-133 (7200rpm)	£15	£17.63
• 15" NEC TFT screen	£130	£152.75
• 128MB GeForce4 - Ti 4600	£125	£146.88

OPEN 7 DAYS A WEEK, CALL US



020 8208 4706

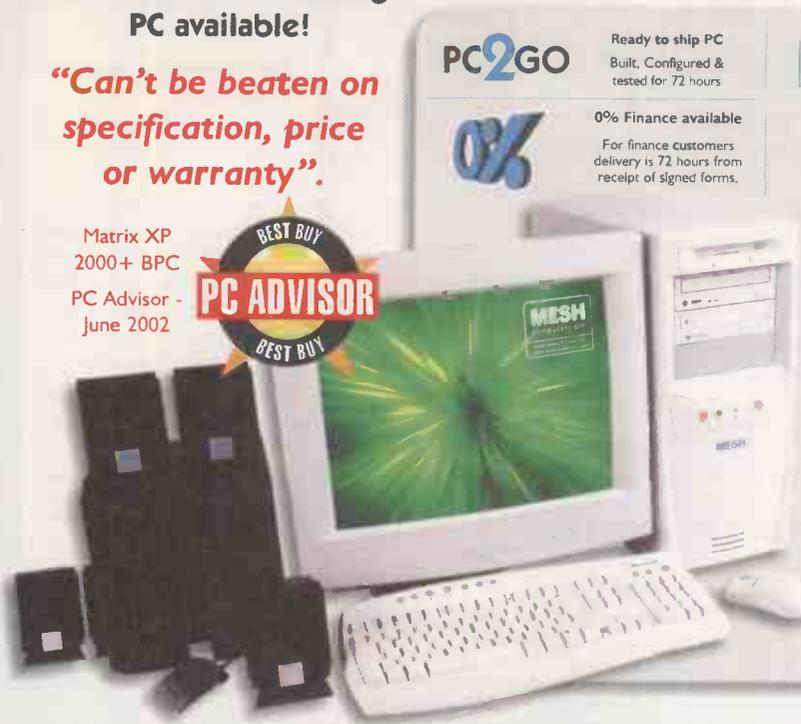
LONDON 020 8208 4706 • LEEDS 0113 219 3460 • EDINBURGH 0131 335 3394 • GLASGOW 0141 221 6585 • BELFAST 02890 235 800 • DUBLIN 016 795 995

No.1 Power PC for £999 EXC.

The best award winning PC available!

"Can't be beaten on specification, price or warranty".

Matrix XP 2000+ BPC
PC Advisor - June 2002



PC2GO

Ready to ship PC
Built, Configured & tested for 72 hours



0% Finance available
For finance customers delivery is 72 hours from receipt of signed forms.

Matrix XP 2000+BPC



AMD Athlon™ XP 2000+ with QuantiSpeed™ Technology
ASUS A7V333 technology (supports 333MHz & USB 2.0)
256MB High Performance DDR
80GB UDMA-133 (7200rpm) with 2MB buffer
19" Mitsubishi DPLUS 92 .25mm (18" VIS)
- Upgrade to 15" NEC TFT for £50 £58.75 inc. VAT
64MB ATI Radeon 8500LE with TV out & DVI
16x DVD ROM
CDRW (40x12x48) with buffer
SoundBlaster Audigy with 1394 FireWire port
Creative Labs Inspire 5300- 5 Point Surrounds
56Kbps V90 voice/fax/data
MESH 3 Year On-site Warranty†
Lotus Smartsuite (latest edition)
Plus Standard Features (see left)

£999 £1173.83 inc.VAT

• Upgrade to Athlon™ XP 2100+ for £30 35.25 inc. VAT

QUALITY COMPONENTS

AMD Athlon™ XP



AMD Athlon™ XP processor with QuantiSpeed™ Technology. Enhanced productivity for Windows XP

ASUS Technology



MESH systems come with ASUS motherboards enhancing the performance of Windows XP

nVIDIA Graphics



Featuring the latest graphics from nVIDIA's GeForce family.

ATI Graphics



Featuring the award winning ATI Radeon 8500.

Dolby Sound



All MESH PCs have DVD and most have Dolby Digital Surround Sound

NEC/Mitsubishi Monitors



NEC/Mitsubishi are market leaders in CRT/TFT display technology



MESH only use NEC monitors that conform to ISO 13406-2

Combining Leading components with the No.1 Award winning PC Manufacturer

MESH
computers plc

Top Quality After-Sales Service from the Number 1 Award Winner



Matrix XP 2100+ GF4600

AMD Athlon™ XP 2100+ with QuantiSpeed™
ASUS A7V333 technology (supports 333MHz & USB 2.0)
512MB High Performance DDR
80GB UDMA-133 (7200rpm) with 2MB buffer
15" NEC TFT screen OR 19" Mitsubishi 920 Pro
128MB nVIDIA GeForce4 - Ti 4600 - TV out & DVI
16x DVD-ROM
CDRW (40x12x48) with buffer
SoundBlaster Audigy with 1394 FireWire port
Creative Labs Inspire 5300- 5 Point Surrounds
56Kbps V90 voice/fax/data
MESH 3 Year On-site Warranty†
Lotus Smartsuite (latest edition)
Plus Standard Features (see above left)

£1369 £1608.58 inc.VAT

Upgrade the Matrix XP 2100+ GF4600 exc. inc.VAT

- 17" NEC TFT Screen £180 £211.50
- Panasonic DVD-RAM/R Drive £299 £351.33
- Logitech ITOUCH cordless keyboard + mouse £40 £47.00

MESH Support package
Quality After-Sales Service

3 Year On-site Warranty

† If you have technical difficulties within the first 3 years then contact MESH technical support. If the problem cannot be solved over the phone and a hardware fault is diagnosed, on-site attendance is available for hardware replacement (subject to terms and conditions - mainland UK only) or MESH will pay carriage and collection for full diagnostic checking at our production centre.
† All notebooks have a 24 Month Back To Base Warranty.

Our support services also cover:-

- Lifetime telephone hardware support
- 24x7 on-line email support
- Intelligent Recovery CD

E-Direct at
www.meshcomputers.com



On-line shopping has never been easier. Just type in your E-Direct reference number within the MESH website and we'll take you to your specific PC showing full specifications, up to date pricing and upgrades.

MESH Payment options

By Credit cards, Cheque, Bankers draft or Bank transfer.



Easy Finance

We have a range of flexible finance options to suit your needs.



Example based on £999 exc. VAT - £1173.83 (inc VAT). Deposit 10% £117.38. Balance £1056.44, pay 5 monthly payments of £41.21 and a sixth and final payment of £850.40. Total amount payable £1173.83 (0% APR) or continue to pay £41.21 per month for a further 43 months (29.8% APR)

Over 48 months - Example based on £999 exc. VAT - Pay 10% deposit (£117.38) then £35.87/month for 48 months. Total Price = £1839.14 (19.9% APR).

Credit accounts

Accounts for Business customers maybe available subject to status. For Government funded organisations, an official purchase order will be accepted.



MESH Build to Order

If you have a special requirement, please talk to one of our experienced sales consultants who can help with your order. Alternatively, visit the shop@mesh area of our website where you can configure and order your own system any time, any day.



No Surcharge on Credit Cards



24 HOUR SHOP ON-LINE

FAX 020 8208 4493



www.meshcomputers.com

EMAIL sales@meshcomputers.com



Budget Intel PC for £599 EXC.

IDEAL FOR HOME OR OFFICE



0% Finance available
We have a range of flexible finance options to suit your needs.



Excellent Value - 1.2GHz Intel Processor PC

Elite 1.2GHz CX



- Intel® Celeron™ 1.2GHz processor
- 256MB High Performance SDRAM
- 40GB UDMA-100 HD
- 17" Digital .27mm (16" VIS) - Upgrade to 15" TFT £180 +VAT
- 64MB nVIDIA GeForce2 MX400 with TV out
- 16x DVD-ROM
- Onboard SoundBlaster Compatible
- Stereo amplified 80W (PMPO) speakers
- 56Kbps V90 voice/fax/data modem
- MESH 3 Year On-site Warranty†**
- Lotus SmartSuite (latest edition)
- Plus Standard Features (see right)

£599 £703.83 inc.VAT

- Intel® Pentium® 4 1.8GHz £70 £82.25 Inc.
- 40GB (7200rpm) with 2MB Buffer £10 £11.75 inc.
- 64MB nVIDIA GeForce4 MX440 £20 £23.50 inc.

Elite Range Standard Features

- Tower Case with tool free access
- 4 USB Ports
- 1.44MB 3 1/2" floppy disk drive
- Microsoft internet keyboard and Intellimouse with mouse pad (unless otherwise stated)
- Virgin.net Internet & E-mail Access
- Microsoft Windows XP (Recovery CD)
- Microsoft Internet Explorer (v.6.0)
- DVD includes decoding software
- CDRW includes burning software

MESH PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

Lotus SmartSuite (latest Edition)



- Award-winning Lotus SmartSuite Includes:
- Word Pro
 - 1-2-3
 - Freelance Graphics
 - Approach
 - SmartCenter
 - Organiser
 - FastSite

MESH Elite Range



*Finance available on all systems



Elite 1.8GHz MX



- **Processor** Intel® Pentium® 4 1.8GHz processor
- **Motherboard** ASUS latest technology (supports 333MHz)
- **Memory** 256MB High Performance DDR
- **Hard Drive** 40GB UDMA-133 (7200rpm) with 2MB buffer
- **Monitor** 17" Digital .27mm (16" VIS) - Upgrade to 15" TFT £180 +VAT
- **Graphics** 64MB nVIDIA GeForce4 MX440 with TV out
- **Multimedia** 16x DVD-ROM
- **Storage** Upgrade Option
- **Sound Card** Onboard SoundBlaster Compatible
- **Speakers** Stereo amplified 80W (PMPO)
- **Modem** 56Kbps V90 voice/fax/data
- **Warranty** **MESH 3 Year On-site Warranty†**
- **Software** Lotus SmartSuite (latest edition)
Plus Standard Features (see above)

£699 £821.33 inc.VAT



Elite 2.0GHz MX



- **Processor** Intel® Pentium® 4 2.0GHz processor
- **Motherboard** ASUS latest technology (supports 333MHz)
- **Memory** 256MB High Performance DDR
- **Hard Drive** 60GB UDMA-133 (7200rpm) with 2MB buffer
- **Monitor** 17" Digital .27mm (16" VIS) - Upgrade to 15" TFT £180 +VAT
- **Graphics** 64MB nVIDIA GeForce4 MX440 with TV out
- **Multimedia** 16x DVD-ROM
- **Storage** CDRW (40x12x48) with buffer
- **Sound Card** SoundBlaster 5.1 audio with Dolby Surround (OEM)
- **Speakers** Creative Labs Four Point Surround
- **Modem** 56Kbps V90 voice/fax/data
- **Warranty** **MESH 3 Year On-site Warranty†**
- **Software** Lotus SmartSuite (latest edition)
Plus Standard Features (see above)

£859 £1009.33 inc.VAT



Elite 2.2GHz GF4



- **Processor** Intel® Pentium® 4 2.2GHz processor
- **Motherboard** ASUS latest technology (supports 333MHz)
- **Memory** 256MB High Performance DDR
- **Hard Drive** 60GB UDMA-133 (7200rpm) 2MB buffer
- **Monitor** 19" Digital .26mm (18" VIS) - Upgrade to 15" TFT £130 +VAT
- **Graphics** 64MB nVIDIA GeForce4 MX440 with TV out
- **Multimedia** 16x DVD-ROM
- **Storage** CDRW (40x12x48) with buffer
- **Sound Card** SoundBlaster Audigy with 1394 FireWire port
- **Speakers** Creative Labs Inspire 5300 - 5 Point Surround
- **Modem** 56Kbps V90 voice/fax/data
- **Warranty** **MESH 3 Year On-site Warranty†**
- **Software** Lotus SmartSuite (latest edition)
Plus Standard Features (see above)

£999 £1173.83 inc.VAT

Leading value upgrade options

- | Upgrade the Elite 1.8GHz MX | exc. | inc.VAT |
|---------------------------------|------|---------|
| • Intel® Pentium® 4 2.0GHz | £25 | £29.38 |
| • 60GB UDMA-133 (7200rpm) | £15 | £17.63 |
| • CDRW (40x12x48) | £70 | £82.25 |
| • Live! 5.1 & 4 Point Surrounds | £50 | £58.75 |

- | Upgrade the Elite 2.0GHz MX | exc. | inc.VAT |
|-----------------------------------|------|---------|
| • Intel® Pentium® 4 2.2GHz | £40 | £47.00 |
| • 19" Digital .26mm monitor | £50 | £58.75 |
| • SB Audigy + 1394 & 5.1 speakers | £50 | £58.75 |

- | Upgrade the Elite 2.2GHz GF4 | exc. | inc.VAT |
|--------------------------------|------|---------|
| • Intel® Pentium® 4 2.4GHz | £125 | £146.88 |
| • Memory to 512MB DDR | £70 | £82.25 |
| • 80GB UDMA-133 (7200rpm) | £15 | £17.63 |
| • 15" NEC TFT screen | £130 | £152.75 |
| • Logitech cordless KB & mouse | £40 | £47.00 |

OPEN 7 DAYS A WEEK, CALL US



020 8208 4706

LONDON 020 8208 4706 • LEEDS 0113 219 3460 • EDINBURGH 0131 335 3394 • GLASGOW 0141 221 6585 • BELFAST 02890 235 800 • DUBLIN 016 795 995

No.1 Notebook from £1099 EXC.

PC2GO

All notebooks are Built, Configured & tested for 72 hours



0% Finance available
For finance customers delivery is 72 hours from receipt of signed forms.

The most powerful P4 notebooks available!

Discovery 14.1" P4 2000



Intel® Pentium® 4 - 2.0GHz with 512k cache
14.1" TFT XGA (1024x768)
256MB SDRAM - Upgradeable to 1GB
20GB ATA-100 EIDE
56Kbps V90 fax modem
16MB DDR ATI M6-M AGP Graphics
8x DVD-ROM & External 3.5" Floppy Drive
2x PCMCIA Type II slot, VGA for external monitor
2 x USB, IEEE 1394, Audio out (SPDIF), m/c-in, TV out, IR, Parallel
3-D stereo sound with internal speakers and mic
Windows keypad (includes 5 hot keys)
313mm(W) x 263mm(D) x 36mm(H) Weight 2.95Kg
Plus Standard Features (see below)

£1099 £1291.33 inc.VAT



Discovery 14.1
PC Advisor & What PC?

Power & versatility on the move

Discovery 15.1" P4 2000



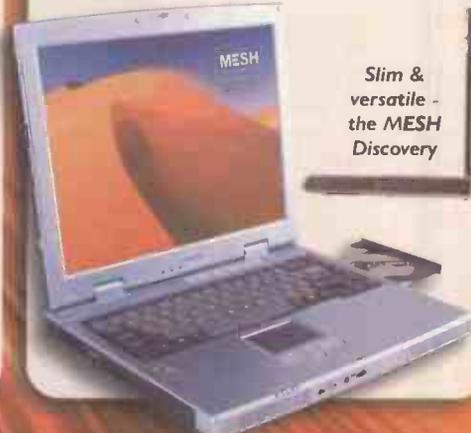
Spec same as Discovery 14.1" but with
15.1" TFT XGA (1024x768)



Discovery 14.1

£1188 £1395.90 inc.VAT

Slim & versatile - the MESH Discovery



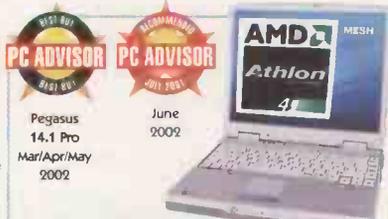
MESH Notebook Range

MESH Notebook Support

24 Months Back-to-Base



*Finance available on all notebooks



Pegasus 1600+ 14.1"



Processor	AMD Athlon™ 4 1600+ with PowerNow! Technology
Screen	14.1" TFT XGA (1024x768)
Memory	256MB SDRAM - Upgradeable to 384MB
Hard Drive	20GB ATA-100 EIDE
Modem	56Kbps V90 fax modem
Graphics	32MB Shared Video Memory
Multimedia	8x DVD-ROM & Built-In 3.5" FDD
PCMCIA	2 x Type II & I Type III PCMCIA slot, supports zoomed video
Ports	2 x USB, IrDA, TV-Out, Serial, Parallel, Monitor, PS/2, FIR
Speakers	3D stereo sound with internal speakers and microphone
Keyboard	Windows keypad (includes 5 hot keys)
Dimensions	310mm(W) x 266mm(D) x 40mm(H)
Weight	3.0Kg

£899 £1056.33 inc.VAT

Pegasus 1600+ 15.1"



Spec as above but with
• 15.1" TFT XGA (1024x768)
• 30GB ATA-100 Hard Drive

£999 £1173.83 inc.VAT



Explorer 15.1" P4 2200



Processor	Intel® Pentium® 4 - 2.2GHz with 512k cache
Screen	new 15.1" TFT XGA (High Res 1400x1050)
Memory	256MB DDR RAM - Upgradeable to 1GB
Hard Drive	30GB ATA-100 EIDE
Modem	56Kbps V90 fax modem
Graphics	new 64MB external DDR Radeon ATI M7-P AGP 4x
Multimedia	COMBO 6x DVD & 8x4x24 CD-RW (SWAPPABLE)
PCMCIA	1 x PC Card slot
Ports	Firewire, 4 x USB, IrDA, TV-Out, Parallel, Monitor, PS/2, SPDIF
Speakers	3D stereo sound with internal speakers and microphone
Keyboard	Windows keypad (includes 3 hot keys)
Dimensions	329mm(W) x 290mm(D) x 44mm(H)
Weight	3.2Kg

Includes SWAPPABLE Floppy Disk Drive

£1399 £1643.83 inc.VAT

Notebook Standard Features & Support

↑24 months Back To Base Warranty
Touch sensitive mouse pad pointing device with two buttons, 10/100 Ethernet Adaptor (Network ready), Smart Li-ion Battery, Carry Case, AC/DC PSU, Microsoft Windows XP.

Upgrade Options on MESH Notebooks

	exc.	inc.VAT
• Upgrade from P4 2GHz to 2.2GHz	£69	£81.08
• Upgrade from P4 2GHz to 2.4GHz	£199	£233.83
• From 256MB to 384MB SDRAM	£39	£45.83
• From 256MB to 512MB SDRAM	£69	£81.08
• From 256MB to 1GB SDRAM	£375	£440.63
• From 256MB to 512MB DDR	£79	£92.83
• 20GB to 30GB Hard drive	£29	£34.08
• 30GB to 40GB Hard drive	£29	£34.08
• Upgrade DVD to CDRW	£25	£29.38
• Upgrade DVD to COMBO	£99	£116.33

Important - Please read: MESH computers plc operate a policy of continuous improvement and consequently prices and specifications are subject to change without notice. This offer is subject to availability. All sales are subject to MESH Computers plc terms and conditions, a copy of which may be obtained upon written request. Industry standard CRT sizing applies to monitors, viewing area maybe approximately 1" less. Systems will be released for delivery upon receipt of cleared funds or finance. All delivery dates are estimated and cannot be relied upon or guaranteed by MESH Computers plc. *Virgin.Net* internet service is subject to terms and conditions (*Virgin.Net* 4.0 does not support ISDN). If you do not use a BT line then you should check with your telephone service provider that your line will support your Fax/Modem. MESH Computers plc cannot accept responsibility for systems used on non-BT lines. Interest will be charged from the date of the agreement if the balance is not paid in full before the first payment date. *Credit is subject to status. A written quotation is available on request. Notice: This advert does not form part of any sales contract. All products shown are for illustration purposes only. Calls to MESH Computers may be monitored for training purposes only. Please check the latest details with a sales person prior to ordering. Minimum delivery charge is £39.00 + VAT (mainland UK only). The Intel Inside logo and Pentium are registered trademarks of Intel Corporation in the United States and other countries. All trademarks are acknowledged. E&OE.

MESH

computers plc

NO.1 AWARD WINNER

Winning more awards from the IT press than anyone else over the past 3 years!



Winners of the Best PC manufacturer of 2001 from PCW Magazine



We were voted Best PC manufacturer, by the writers & readers of PC Plus Magazine

RECENT WINS



June 2002



BEST BUY

June 2002



June 2002



BEST VALUE

June 2002



June 2002



BEST BUY

May 2002



HIT!

May 2002



May 2002



MESH is ISO 9001: 2000 certified

24 HOUR SHOP ON-LINE www.meshcomputers.com

FAX 020 8208 4493

EMAIL sales@meshcomputers.com

JULY 02 R

Displays take a LEP in the dark

Flexi-screens and dynamic wallpaper are two prospects of the emerging world of carbon IT. Clive Akass reports

Jeremy Burroughes first saw the light in 1989, when he was testing the electrical properties of some materials at Cambridge's Cavendish Laboratory. At first he thought the green glow was a reflection from a nearby monitor. But as he moved closer he realised it came from a polymer under test.

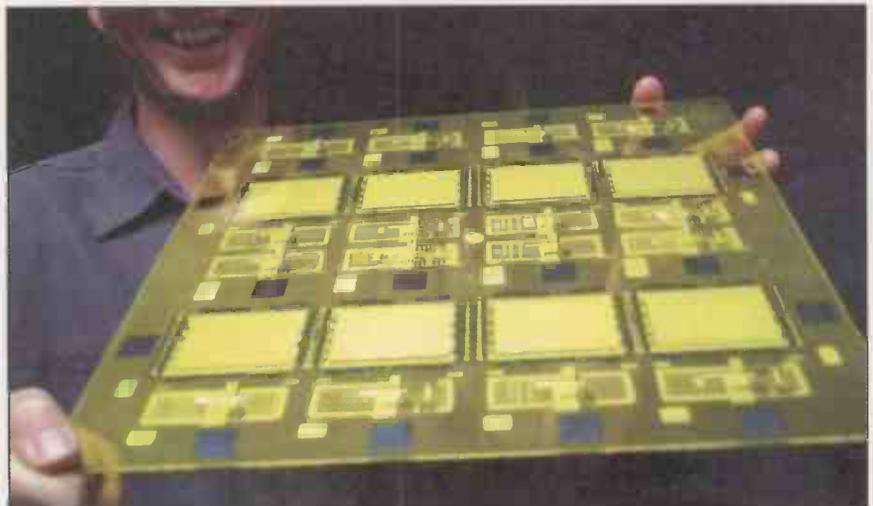
In a Eureka moment of a kind few researchers experience in a lifetime, Burroughes had discovered the basis of a display technology that could change the shape of computers and the way we use them. And the light-emitting polymer (LEP) he found is only one example of a vast range of carbon-based materials that could have a great impact by enabling the production of cheap spray-on logic (see opposite).

Burroughes still sounds bemused when he recalls seeing that first glow. 'There was tremendous excitement at the lab. Everyone burst in to look at the light. Within minutes people were scribbling down lists of applications.'

The surprise was greater because US researchers had recently concluded that it would be impossible to inject the electrons into the polymer that would be necessary to generate light. Burroughes, his research director Richard Friend, and a colleague formed a company called Cambridge Display Technology (CDT) to exploit LEPs, a subset of what are now called organic light emitting devices (OLEDs – see box below right). Last month CDT opened an £18m pilot plant at Grantchester, near Cambridge, to hone the manufacture of LEP screens – one of several projects across the world stemming from that one moment of discovery.

LEPs have several advantages over liquid-crystal displays (LCDs). They generate light, rather than selectively blocking it, and so are inherently more efficient and require less battery-draining power for a given amount of light. They also switch about 100 times faster than LCDs, making them better for video.

Moreover, polymer screens are potentially much cheaper to produce, and not only because they are simpler. LEPs are soluble and can be made into 'inks', allowing screens literally to be



LEP screens in production at CDT's new plant. Displays may one day be printed like newspapers

printed using adapted inkjets. A CDT partner helping to pioneer this approach is Seiko-Epson.

More startling still, LEP layers may eventually be mass printed like newspapers. The definition will not be high, at least initially, but you can start thinking about wall-sized displays, dynamic wallpaper, and light-emitting curtains – LEPs can be used as a simple light source. Most exciting for those interested in the evolution of mobile computers is the possibility of flexible screens that might be scrolled up and put into your pocket. As *PCW* has pointed out before, this could blur the distinction between a handheld and a notebook – or, more likely, introduce a completely new class of machine (see http://images.vn.unet.com/v5_static/pcw/pdf/Universalinterface.pdf).

But David Fyfe, chairman of CDT, is anxious to play down the prospect of flexible screens for the short term. LEPs are very sensitive to water and currently need to be encapsulated in glass, as no known plastic approaches its impermeability.

Fyfe points out that a lot of people are working on the problem, including DuPont, a major CDT licensee well versed in material science. He said: 'I don't think DuPont would be in the business if it did not think a flexible substrate is possible.' Another licensee is Osram, which, like DuPont, is a newcomer to screen technology. Fyfe said LEP technology, with its completely new manufacturing processes, gave newcomers a chance to enter the display business on the same level as old hands. The Taiwanese are very interested in manufacturing but the Japanese seem to be holding back, said Fyfe. 'I think they have too much invested in LCDs.'

Indeed the LCD is likely to rule for some time before alternatives start to dent its market share. CDT still has to increase the lifetime of the blue

element of its full-colour screens and improve their efficiency. Fyfe admitted: 'Currently only 30 per cent of the light gets out of the device. We want to push that figure up.'

But an LEP screen has already been used on a Motorola phone, and similar sizes will start to appear later this year from the likes of Philips. PDA screens are at least a year away and no-one is placing any bets on when larger sizes appear. But they are coming soon and they will put current screens in the shade.

GREAT BALLS OF FIRE...

Organic light emitting devices (OLEDs) use carbon-based materials with photo-electric properties similar to the LED lights on your PC: they glow when they pass current. But they are far more versatile. Cambridge Display Technology's (CDT's) light-emitting polymers (LEPs) are called 'big molecule' to distinguish them from 'small-molecule' OLEDs developed by Kodak (polymers – familiar in the form of plastics – consist of molecules built around long chains of carbon atoms). Kodak has already demonstrated full-colour OLED screens big enough for a sub-notebook. As with LEP screens, the most striking thing is that they can be viewed from a wide angle.

CDT believes its technology has the edge as its screens can be printed (see above) while Kodak's requires a more expensive deposition process. A company called Ophys, in conjunction with St Andrews and Oxford Universities, is working on an exotic class of molecule called light-emitting dendrimers that it says combines the best of both technologies. A dendrimer (see



A watch using a full-colour LEP screen

We could soon be able to print out high-resolution cyberskin. Just don't ask where that could lead

Let us spray for all manner of smart surfaces

Soluble semiconductor polymers are bringing a new versatility to the printed circuit, traditionally a template of interconnections onto which components can be soldered. Now components themselves can be inkjet-printed to produce a wide range of devices, from intelligent labels to 'cyberskin' and other smart surfaces.

It is becoming possible to draw up a logic circuit or even a custom chip in a computer-aided design package and print it out fully formed on an inkjet, according to Tracey Stephens, marketing manager of Plastic Logic, a spin-off from the same Cavendish Laboratory that spawned Cambridge Display Technology (CDT).

The technique is never going to replace silicon but it looks good for mass-produced throwaways, such as smart tags, or for niche products that would be uneconomical in silicon. A target application is to produce active-matrix drivers for LEP screens of CDT, which owns a slice of Plastic Logic. This would enable both the light-emitting and driver layers to be sprayed on, avoiding a series of costly lithographic processes.

The idea of printing logic is even older than LEPs; but researchers quickly found that inkjets, though precise enough to print pixel matrices, lack the resolution needed to trace the microstructure of a useful transistor. Finding a way round this has been one of the major breakthroughs exploited by Plastic Logic (see box above right).

ALL THE NODES THAT ARE FIT TO PRINT...

This picture of a Plastic Logic transistor shows the problems of printing circuits. The blobs on either side of the thin central straight line were squirted by inkjet and are the source and drain of the transistor. You are viewing them through the third element, the gate. The transistor turns on (ie current flows across the channel between the source and drain) when a suitable voltage is applied to the gate.

The channel has to be no more than five micrometres wide, well beyond the accuracy of an inkjet. Plastic Logic gets round this by tracing the channel patterns with a material that repels the water-based polymer 'ink'. Prototypes used expensive



lithography to get these patterns, which rather defeats the object, but Plastic Logic has developed an alternative method that it is currently keeping to itself.

Another breakthrough was to find a way of allowing an inkjet head effectively to 'see' where it is printing, avoiding the tricky and expensive registration issues of lithographic printing.

A third has been to find a way of producing 'via holes' to hold non-printable components or connect different circuit layers. Stephens stresses that the technology is still under development and will not go commercial until late 2003 at the earliest. First applications are likely to include electronic tags; next will come Smart cards, low-

capacity memory and sensors – one suggestion, post 11 September, was for an Anthrax detector. OLED displays, custom chips and perhaps processors are possible within four or five years.

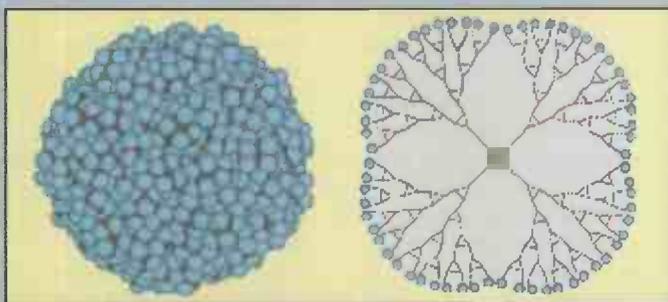
Other suggestions include smart delivery systems for drugs, giving patients the correct dose on schedule, packages that announce when they are getting empty or games printed on the back of food packages.

Printed circuits are not limited to logic. ID tags could include an RF module that allows wearers to be tracked round a site. (Perhaps something similar could be used to allow lost socks to trace their partners.) A combination of LEPs and printed logic could turn almost any object, including items of clothing or jewellery, into a dynamically changing display.

Printed circuits do not share the encapsulation problems of LEPs and can use plastic substrates, which leads to other intriguing possibilities. Set sensors into a flexible mesh of surface logic and you get a kind of cyberskin that could increase the resolution of devices that transmit or receive body movements and tactile pressure. The possibilities are endless.

More prosaic are smart surfaces of a kind also being investigated at Cambridge. They consist of a matrix of contacts that automatically configure themselves to deliver services to devices placed in any way on the surface. This would enable your mobile phone, for instance, to synchronise and start charging itself as soon as it is put down. One thing Plastic Logic certainly does not lack is ideas on how to use the technology. 'It seems everyone who comes to visit us comes up with a new suggestion,' said Stephens.

...LIGHT-EMITTING DENDRIMERS AND OTHER EXOTIC ORGANICA



picture) consists of a light-emitting core surrounded by charge-carrying branch-like structures called dendrons reaching out to a surface of atomic clusters that repel each other to produce a large, sprung, ball-like molecule. Opsy says the core can consist of the kind of material Kodak uses for its small-molecule screens.

The surrounding molecular structure separates each light-emitting element and provides solubility that enables LEP-style printing of screens. The core can be adjusted for qualities such as colour

without affecting the outer structure. But dendrimer technology is less mature than LEP and is likely to take longer to translate into products.

A US company called Universal Display is also working on flexible OLED screens and has produced moulded screens for use in military head-up displays. Similar mouldings could transform dashboards and even cartons into dynamic displays.

In a future issue we'll let you know about another potentially revolutionary carbon-based technology based on nanotubes.

The dendrimer ball-molecule (left) consists of a light-emitting core surrounded by branch-like dendrons (right)

Go to www.pcw.co.uk for a hyperlinked version of this report

'Use IPv6' plea to boost web phones

Microsoft is trying to kickstart the rollout of Internet Protocol v6 (IPv6), which is set to supersede the current IPv4, in a bid to alleviate a shortage of web addresses and improve multimedia delivery.

IPv6 can label data packets according to priority, allowing the timely delivery of voice and other multimedia data streams, which tend to get broken up under IPv4. This could lead to huge changes in the way we use the web, with a drift from the plain-old telephone (POT) to Voice-over-IP and videophones.

This in turn would play havoc if it happened quickly. POT revenues would plummet and the 500K 'broadband' would start to look slow and lopsided – videophones eat bandwidth in both directions.

But IPv6 is designed to be phased in, and Microsoft fears it is taking too long. Engineers at the Windows Hardware Engineering Conference (Winhec) were urged to support IPv6 in new hardware and applications.

Microsoft's enthusiasm stems from a hope that the PC will be the new phone, with people communicating via text, voice and video messaging systems built into its operating systems.

But a more pressing need is for IP addresses – those provided by IPv4 could run out within a year. IPv6 uses 128bit addressing which provides billions of a address per person.

New deals start rush to broadband

Price cuts and self-installs seem to have kicked off broadband use in Britain at last. BT reported that wholesale orders were running at 10,000 a week – and escalating.

The rush seemed to catch both BT and suppliers by surprise. Several vendors reported delays of up to two weeks for the delivery of kit. There was a big demand for routers and hubs that allow several users to share a broadband link – making it potentially cheaper than dial-up.

Of course, bandwidth as well as cost has to be shared, but the fact that a connection is always on can be as much a benefit as bandwidth compared with a dial-up link.



Devices such as this Actiontec Wifi access point and router can help spread broadband costs

The online store Solwise reported a shortage of the microfilters needed to adapt phone extensions. Freeserve began selling £84.99 broadband start-up kits through Dixons, PC World, The Link and Currys stores across Britain, linked to a £29.99 a month service – much the same as other major vendors like BT Openworld.

BT Retail offered a 'no frills' service at around £2 a month cheaper but links are available for as little as £22 a month.

Charles Raube, head of Telewest Broadband, which offers a £25-a-month cable service, dismissed the BT Retail offer as 'sub-standard'. But the base prices for cable are contingent on users buying into a TV package, standalone broadband cable links cost £29.99 a month.

However, Telewest has launched an introductory offer of £13.48 a month for the first three months, with a return of a £50 install fee if the customer is not satisfied.

● See Gordon Laing's rundown of the options available in a four-page special feature starting on page 89.

Contentious issue of cable versus DSL

The rush to broadband has given many people the problem of whether to go for an ADSL or cable link. We have used both a business-class ADSL package from BT Openworld and a Telewest Blueyonder link, and have found little to choose between them.

The ADSL is much more reliable than in its early days but we very occasionally lose the connection; usually this is restored by the simple expedient of resetting the router. This seems to happen slightly more often with cable, but again a reset does the trick. BT claims that ADSL is less vulnerable to contention, the network equivalent of traffic jams: with cable you are in effect sharing a local area network with your neighbours. I have heard people complain of cable slowdowns; but

this can happen with ADSL too – the difference is that the contention is on the link from your local exchange to the backbone.

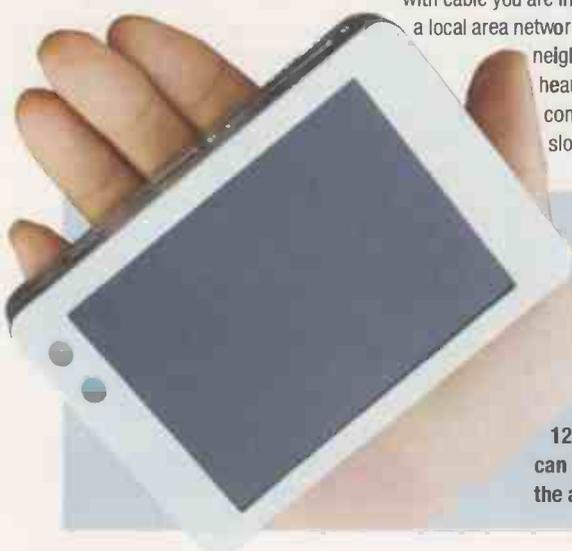
This is likely to become more of an issue as more people use broadband. Therefore, you should bear in mind that some of the cheaper packages have higher contention ratios – that is, more people are sharing the line.

Fergal Butler, Telewest's head of Internet strategy, denies that the problem is worse on cable, but says it is difficult to reduce the issue to simple terms like contention ratios, because you are comparing two different ways of managing network capacity. 'We have a policy of resectioning [reducing the number of users in the loop] when bandwidth usage reaches 85 per cent,' he said. 'I'm bound to say we have not had an instance of any section getting

anywhere near that.' But he admits that this system is based on overall traffic and cannot dynamically kick in to cope with bursts of activity – but then nor can ADSL.

Both Telewest and NTL, Britain's other big cable company, have had to restructure to cope with dire financial problems, which may put off some users after the fall of ITV Digital. But as demand for bandwidth soars and today's 500K links begin to look like a crawl, they have far more headroom than BT – at least on its current infrastructure.

Only a fraction of the cable bandwidth is used for broadband and much of the rest is squandered on little-used TV channels, many of which are only on for part of the day and not at all at night. Butler says Telewest is looking at ways of using the system a bit more imaginatively.



QOO CUES NEW MULTI-MODE FORMAT

Microsoft showed off yet another computing form factor at Winhec (see above left), in the wake of its Mira and Tablet PC designs for untethered PCs.

The nine-ounce QOO measures just 12.4 x 7.4 x 2.3cm (4.9 x 2.9 x 0.9in) and can be used as it is, or as a notebook, with the aid of a special enclosure, or as a

desktop with the aid of a cradle linked to a screen and keyboard.

It packs a 4in VGA touchscreen, 256MB of Ram, a 10GB drive, Firewire and USB support, plus Wifi and Bluetooth links. It is driven by a 1GHz Transmeta processor. The first products are set to ship later this year. www.oqo.com

As used by the likes of
Aramiska... a Eutelsat satellite



Satellites plug the gap

Vendors of satellite services are falling over themselves to cater for the third of the UK that lacks access to broadband land lines. BT was on schedule to enable a further 100 exchanges for ADSL by the end of May but that still leaves out some eight million homes – not counting businesses.

Start-up costs for satellite links are higher but businesses in some areas qualify for subsidies through regional development agencies. Blocks of flats and even villages can share both the cost and bandwidth of a satellite link (and, by setting up as a company, may get a grant).

Early satellite access tended to be download only, so you had to use a dial-up line for the uplink. Two-way services are now available, though uplinks are still slower.

BT Openworld's 500/1 service is among the cheapest at £69.99 500/150Kbits/sec (up/down) link plus £899 for kit and installation. It caters officially for a single PC, though it is unclear how you can be prevented from hooking in a small

network. Openworld's 500/4 service, which is designed for networks, costs £139.99 a month plus £1,299 start-up.

Aramiska has five packages, all with a £500 start-up fee, ranging from £199 a month for a 256/64Kbits/sec link to £549 for a 2,046/320Kbits/sec. These use the DVB-RCS transmission standard, rather than the older VSAT like BT Openworld, and come equipped for a network of up to 30 PCs (extendible in the more expensive packages to 100 PCs) with a mail server, and remote mail access, with firewalls at both the head and home ends.

The entry-level Aramiska packages charge £15 for each 100MB above 1GB per month; the company also offers its entry-level deal at £99 a month, with an unsubsidised £3,500 start-up fee.

Bentley Walker offers VSAT services starting at £71 a month. All these prices exclude VAT. Details are at www.bentleywalker.com, www.btopenworld.com/satellite www.aramiska.net

Sendo may do an organiser

UK smart phone developer Sendo may bring out a PDA if it thinks there is a market for one. 'We have not ruled anything out,' said Ron Shaffer, senior product manager of the about-to-be-launched Sendo Z-100.

This is an organiser in the format of a mobile phone, as opposed to the new generation of PDAs which can also be used as phones, like O₂'s XDA or Handspring's Treo. The big question is which format will win, or whether they will coexist.

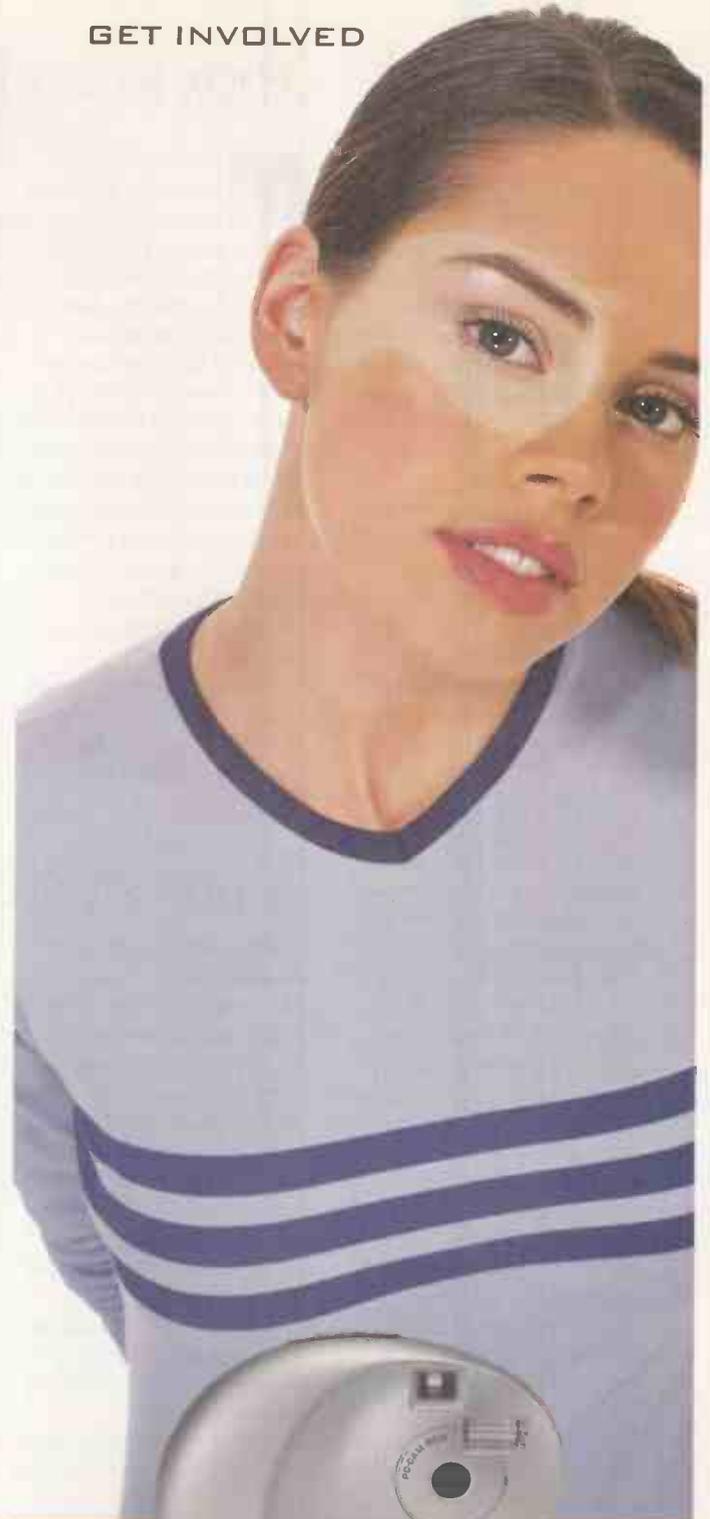
Shaffer inclines to the latter view. 'But we think that the phone format

will sell more,' he said. Prices of both formats will start at around £400 and may cost much more, depending on the subsidy from the service provider.

A fall in the price of integrated Bluetooth (and possibly Wifi) links may favour the PDA format by allowing people to use wireless headsets and leave the handheld in their pocket. Bluetooth already costs as little as £10 a device.

Sendo's Z100 is virtually alone in using Microsoft's PocketPC 2002 phone edition.

GET INVOLVED



CREATIVE PC-CAM 600.
YOU TRY PUTTING IT DOWN.



DIGITAL PHOTOS



TIMER



INTELLIGENT FLASH



MINI MOVIES



AUDIO



WEBCAM

www.europe.creative.com

CREATIVE

© Copyright 2002, Creative Technology Ltd. Creative is a registered trademark and WebCam is a trademark of Creative Technology Ltd. All other brand names and product names are trademarks or registered trademarks of their respective holders. All applications are subject to change without prior notice. Actual product may differ slightly from those pictured.

Hailstorm abates in security storm

Microsoft has dropped its Hailstorm project of creating an online database of personal information on ecommerce users, following protests from privacy groups.

The Electronic Privacy Information Center (Epic), one of 16 consumer organisations that filed complaints with the Federal Trade Commission, said Hailstorm could not protect privacy and security.

Rob Enderle, an analyst at Giga Information Group, said Microsoft will be focusing on other organisations, such as banks, to hold information. He added: 'We really didn't think many would trust Microsoft, or any vendor, for this anyway.'

PCW number 1130855

Explorer peril

The 'Back' button in Internet Explorer (IE) can be dangerous for your data, according to research from Andreas Sandblad, of the University of Umea in Sweden.

He says code injected into a hyperlink or URL can be set to trigger when the Back button is clicked. The danger comes if you hit the Back button after a page fails and you get a 'this page cannot be displayed' error.

This allows rogue code be executed on the local computer. All versions of IE are thought to be affected, although some code will only work on certain versions of Windows. Microsoft has not responded to alerts about the issue.

Currently the only work-around is to disable active scripting in the browser or stop using the Back button.

James Middleton

PCW number 1131017

AOL loses \$54b

Microsoft's woes (right) are nothing compared to those of rival AOL Time Warner. It posted a phenomenal loss of \$54.2b for the first three months of this year – the biggest in US history. AOL online services are one of the poorest performing parts of the company.

PCW number 1131245

Xbox loses first battle of console war

Microsoft's hopes of dominating the console gaming market hit a major obstacle when poor sales of its Xbox prompted the Redmond giant to cut £100 off the retail price, barely six weeks after it was released.

As of 26 April it was possible to buy the console for £199, a price that brought it into line with Sony's market leading Playstation 2 (PS2). Despite initial claims from Microsoft that it was pleased with the launch sales of the console, it's believed pressure from games developers and the subsequent launch of Nintendo's Gamecube prompted the price cut.

A week later Nintendo retaliated by announcing that the Gamecube would retail at £129, rather than the widely speculated £159, on its 3 May release.

Despite Xbox selling well in North America, where it launched last November, Microsoft has struggled to get a significant foothold in Europe where it launched on 14 March and in Japan, home to Sony and Nintendo. Sales in Japan were hit following reports that the machine left some DVDs and game discs with scratches, a problem that Microsoft sought to remedy. Last month sales of the Xbox in Japan were reportedly left flagging behind the older PSone console and the now defunct Dreamcast.

Despite a major marketing push by Microsoft the Xbox has failed to meet forecasted targets of six million units throughout Europe by June, prompting the company to lower its expectations. A high price tag and the appeal of

the Gamecube are believed to have kept consumers cautious, while PS2's 18-month head start has proved tough to crack. This despite the fact that the Xbox's 733MHz processor, Nvidia chipset, hard drive and broadband capability make it the most powerful console on the market.

Microsoft, it would seem, still has a formidable task ahead of it. As Bill Gates digs in for the long term however, Sony, which has 10 per cent of the European market, has already returned to the drawing board and is in the process of designing Playstation 3.

Xbox owners who had bought the console at its original £299 price point can contact Microsoft in order to claim a 'thank you' package of games and hardware worth £115.

Andy Stewart

Gates stands tall as skeletons rattle

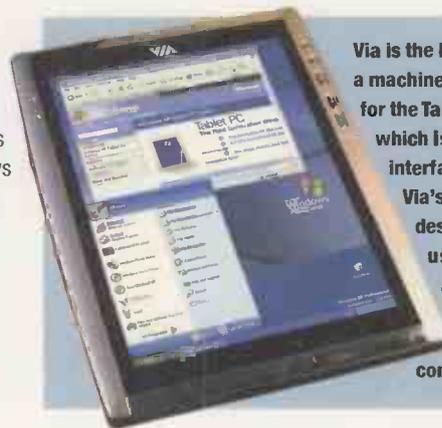
The Xbox has been only one of Microsoft's woes over the past few weeks, with lawyers at the seemingly endless anti-trust hearings seeking out new skeletons to rattle. There was some good news for the company. Bill Gates put up a good court performance following his disastrous early videotaped evidence. Sales of XP reached an astonishing 32 million and first-quarter profits hit \$2.74b, 12 per cent up on last year.

But revenues fell just short of expectations and Microsoft said earnings were likely to flag in the next two quarters.

Gates and his henchmen spent much of their court time defending the bundling of Explorer and the Windows Media Player with XP. Lawyers claimed this was squeezing out rival products; Microsoft said they were too tightly coupled to the operating system to be unbundled.

Gates was forced to concede that a decoupled version exists in XP Embedded, but he argued that this worked differently from the mainstream version.

Sun's chief strategy officer Jonathan Swartz revived the old claim that Microsoft does not fully disclose application programming



Via is the latest company to design a machine around the imminent XP for the Tablet PC operating system, which is tailored for a pen interface.

Via's Tablet PC, a reference design for manufacturers using its products, boasts a 10.4in screen, USB2 and Firewire ports, and optional Wifi. It uses the company's C3 processor.

interfaces (APIs) to rivals – and said this was still going on.

He said Microsoft saw web services as a threat because they were server based and could be accessed by non-Microsoft devices. Its answer was the .Net strategy for delivering services but part of the API was being kept quiet to limit access by rival software.

Microsoft group vice-president James Allchin denied another Sun claim that the company continues to thwart distribution of Java.

Earlier, lawyers had produced an email from a Microsoft employee, Fraser Mocke, that advocated using the 'embrace and extend campaigns we have used in the past' to counter

competition from media players such as Real Player and Quicktime.

The idea was to adopt the rival technology and then 'extend' it with technology that would only work with Windows. This is very similar to what Microsoft is said to have done with Sun's Java.

Microsoft lawyers denied knowledge of Mocke and a long-serving manager told the court that she had never heard the term 'embrace and extend'.

Nine states were calling for sanctions on Microsoft to ensure that it opens Windows to rival applications. The trial was expected to run into May.

For updates visit www.pcw.co.uk.

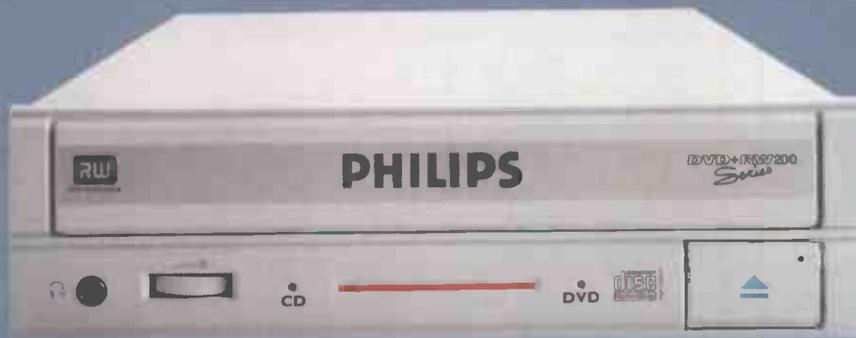
Small change

Record



Big difference

Make your own DVDs from whatever source: home videos, downloads from Internet, anything you can feed into your PC. Thanks to the superior compatibility of DVD+RW your DVD recordings will play perfectly on most DVD or DVD-ROM players. Even stores up to 4.7 gigabyte on one DVD disk! Safely burn your CD- R/Ws: Thermo Balanced Writing guarantees optimal writing on all CD-R/W discs and Seamless Link protects against buffer underrun. All at high speed: 2,5 x DVD ReWrite, 8x DVD Read, and 12x10x32x CD ReWrite.



Philips introduces the DVD ReWriter.



DVD+ReWritable



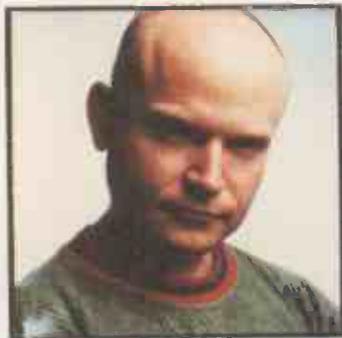
It's not the PC that matters,
it's the peripherals that make the difference.

www.ce.philips.co.uk For more information call 01756 702892
or email: info@philips-brilliance.com



PHILIPS

Let's make things better.



Enlightenment looms

Gordon Laing reaches nirvana as he finds a way to share his ADSL connection

gordoni@pcw.co.uk

Every so often, things all seem to come together. After months or years of hype, you finally experience a group of technologies that actually seem to deliver the goods. I'm sure I'm inevitably in for a fall, but right now I've become quite evangelical about the combination of shared ADSL, wireless networking and a humble PDA.

This couldn't have happened at a better time. After the disappointments of Bluetooth, Wap and GPRS, I was prepared to be let down by every new technology.

Appropriately enough, research giant Gartner Group developed a chart in 1995 perfectly documenting these experiences. Gartner's hype cycle begins with the Peak of Inflated Expectations, followed by The Trough of Disillusionment. I then made my way up the Slope of Enlightenment and reached the technological nirvana that is the Plateau of Productivity. Cringing aside, these terms really do describe my experiences with ADSL. My initial high hopes were dashed by quality of service during the trial period, and the process of swapping providers which could see you losing broadband for several weeks.

My slope of enlightenment began when I realised how easy it was to share my ADSL connection between my main PC and a secondary system. The ISPs may insist that expensive ADSL services are required to connect more than one PC, but that doesn't stop Windows' Internet Connection Sharing (ICS) from pumping IP around your network. ICS is certainly neat, but you need to leave your 'gateway' PC switched on. I also had to disable my software firewall for ICS to work, or buy a more capable version. I also wasn't happy with the tedious dial-up networking process employed by my Alcatel USB modem. Then again, nowhere near as unhappy as my new PC – imagine

my surprise when I discovered USB ADSL modems are incompatible with dual-processor machines. Clearly I had a number of problems that needed fixing.

Everything came together when I realised I could use any ADSL modem. I first believed the supplied Alcatel USB 'Stingray' was part of my ADSL service that I could not change. In terms of official support, it was, but I decided to try plugging in a different model instead. In the end I bought a single box containing an ADSL modem, router and four-port 10/100 Ethernet switch. The modem automatically connects to the broadband service, which the router and switch then share between up to four devices, while also allowing them to communicate over a 100Mbit network – no drivers need installing, no PC needs to be left on and it's got a built-in firewall too. I went for a D-Link DSL-504, but many similar products are also available.

For me the shock was that I'd solved all my networking and sharing issues with a single box costing just £145 ex VAT, and that it just plugged in and worked. Sure, I had to configure it using a browser but this one-off process simply involved changing the connection type to PPPoA, setting the VPI and VCI to 0 and 38 respectively, then entering my user name and password. After this, the unit automatically connects on demand, and it's the only thing that needs to be left switched on.

I have three PCs connected to it, and a cheap wireless access point. The latter allows me to enjoy my ADSL connection anywhere in my home, and right now my preferred mobile device is an HP Jornada 720 handheld fitted with a Wifi card. I've always been a great believer in PDAs, but once you've combined that with a wireless broadband connection, you're

I worry about how the cheapest ISPs can cope with increased demand

hooked. There's also something very eerie about the device being silent, when you're used to the background whirr of a PC or notebook.

It's important to note that the router is also happy to share ADSL with non-PC devices. I could happily connect a games console, set-top box or anything else with an Ethernet port and sufficient intelligence to request a dynamic IP address. It's only after you've fully digested this level of flexibility that you ask yourself why anyone would bother with a USB ADSL modem, apart from to save fitting a £10 Ethernet card. Don't get me wrong – the Alcatel Stingray is a fine device supported by all the ISPs, but no-one is forcing you to use it. Sure, my Stingray was automatically rented as part of the cheapest ADSL service available at the time, but it was a doddle to replace it.

Today's self-install ADSL services require you to buy your own modem. Again, the Stingray is heavily endorsed for around £70 ex VAT, but I think you'd be mad not to spend another £70 for something superior. If you're a new self-install customer buying a different modem, though, remember to buy micro-filters for your phone sockets (see our DIY broadband feature page 89).

With monthly subscriptions starting from just £23, ADSL is also fast-becoming a no-brainer – at least for the 66 per cent of the population it currently reaches. On a darker note, I worry about how the cheapest ISPs can cope with increased demand, but as with all providers, it's a case of wait and see.

Regardless of ISP, though, if you have any intentions of sharing your ADSL connection, then buy a router from day one. Add a wireless access point, and the plateau of productivity could be yours for the taking.

PCW

Beyond your Imagination!

8IRXP-P4 Titan DDR Deluxe



GA-8IRXP "Reference" PC Direct May 2002, German
 GA-8IRXP "Power" CHIP Apr. 2002, Poland
 GA-8IRXP "Editor's Choice" CHIP Russia Apr. 2002, Russia
 GA-8IRXP "Editor's Choice" PC Magazine Mar. 2002, Greece
 GA-8IRXP "Recommendation" PC Actual Mar. 2002, Spain
 GA-8IRXP "Hardwareinfo" Gold Award Mar. 2002, Netherlands
 GA-8IRXP "Editor's Choice" Tomshardware Mar. 2002, WWW
 GA-8IRXP "Best Performance" CHIP, Feb. 2002 Czech

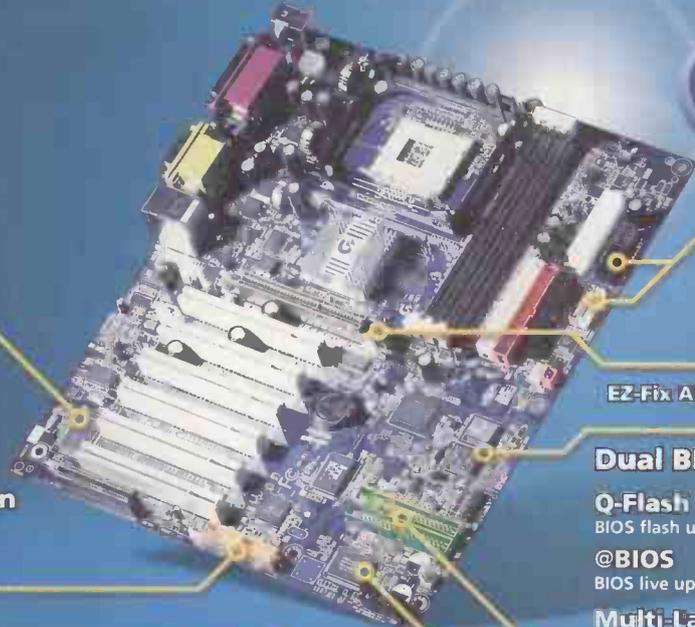
Fully Over-clockable & Jumperless design

Easy Tune III™
Overdrive Utility

Creative Sound Blaster

Intel® Network Connection

USB2.0 x 4
Provides fastest data transfer rate up to 480Mbps



P4 Titan DDR

Providing Memory Stick, Secure Digital and Smart Card solutions

EZ-Fix AGP slot

Dual BIOS™

Q-Flash
BIOS flash utility embedded in Flash ROM
@BIOS
BIOS live update utility via the Internet
Multi-Language BIOS

ATA 133 / RAID 0, 1

Dual BIOS®
GIGABYTE Patented Technology

P4 Titan DDR **USB2.0** **RAID** **P4 Titan 533**
GA-8IRXP Intel® 845 Chipset

- Socket 478 for Intel® new 0.13 micron-process Pentium® 4 processor
- Provides 8 USB connectors (4 by NEC USB 2.0 controller)
- Promise advanced ATA 133 RAID 0,1 support
- Intel® PRO/100 VE Network Connection
- GIGABYTE patented DualBIOS™ technology
- High quality Creative PCI Sound and 5.1-channel support via S/P DIF output
- Gigabyte unique EZ-Fix AGP slot
- Rich in overlocking features



Intel PRO 100 VE Controller
Dual BIOS

P4 Titan DDR **USB2.0** **P4 Titan 533**
GA-8IRX Intel® 845 Chipset

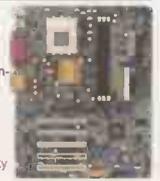
- Socket 478 for Intel® new 0.13 micron-process Pentium® 4 processor
- High quality Creative PCI Sound and 5.1-channel support via S/P DIF output
- GIGABYTE patented DualBIOS™ technology
- GIGABYTE unique EZ-Fix AGP slot
- Rich in overlocking features



Dual BIOS Multi BIOS

AMD Athlon **USB2.0**
GA-7VRX VIA KT333/8233A(CE) Chipset

- Socket A for AMD Athlon™XP/Athlon™/Duron™ processors
- World leading DDR 333 memory support
- Provides 8 USB connectors (4 by Extra USB 2.0 controller)
- Supports Extreme high speed (UDMA ATA 133/100/66) IDE device
- Integrated AC97 audio
- Round corner PCB plate design for better durability



Dual BIOS Q-Flash

Award News



GA-7VXP "Net.de KAUF TIPP" Apr. 2002, German
 GA-7VXP "PC Game Hardware Award" Apr. 2002, Australia
 GA-8IRXP "Editor's Choice" Mar. 2002, Spain
 GA-8IRXP "Hardwareinfo" Gold Award Mar. 2002, Netherlands
 GA-8IRXP "PC Game Hardware" Mar. 2002, Germany
 GA-7VXP "PC Hardware Zone" Mar/Feb 2002, Singapore
 GA-7VXP "Gold Award 2002" Feb 2002, Singapore
 GA-8IRXP "CHIP" Mar 2002, Germany
 Taiwan Symbol of Excellence 1998-2002
 5 years in a row

* These speed settings are not guaranteed by GIGABYTE.
 - The specification and pictures are subject to change without notice.
 - All trademarks and logos are the properties of their respective holders.
 - Any overclocking is at user's risk. GIGABYTE Technology shall not be responsible for any damage or instability to your processor, motherboard or any other components.

For more information, please call our resellers:

- | | | |
|--|--|---|
| A2Z computers
www.a2zcomputers.co.uk
Tel: 01509262636 | Insight Direct
www.uk.insight.com
Tel: 0870 7007374 | Micro Direct
www.microdirect.co.uk
Tel: 0161 2485050 |
| Dabs.com
www.dabs.com
Tel: 0870 1293724 | Jungle.com
www.jungle.com
Tel: 0870 7271771 | Scan
www.scan.co.uk
Tel: 0870 7554747 |

COMPUTEX TAIPEI
June 3-7, 2002
 See you at Hall 2
 Booth no: E141-144,
 1141-1144, 163-170



GIGABYTE™
TECHNOLOGY
 G.B.T. TECH. CO. LTD. (U.K.)
 http://www.gbt-tech.co.uk

Can I put this feeling directly onto paper?



PowerShot S40

Direct Print

Transforming an emotion into a favourite photo needn't mean a complicated detour via a PC. Simply connect your Canon digital camera* directly to our new Bubble Jet S820D photo printer, select your image and watch your special moment reappear in seconds.

Pick it up, and you'll see a photo printed using advanced MicroFine Droplet Technology™, at ultra-high resolution, with microscopic drop size, for the very best in photo quality. You'll notice vivid and consistent colours, which haven't changed since you pressed the shutter. The Bubble Jet Printer S820D also features Single Ink technology to eliminate wasted ink, which means you can print more photos without worrying about the cost.

So think of an emotion you'd like to recreate.

Whatever you can imagine, with Canon you can.

www.canon.co.uk

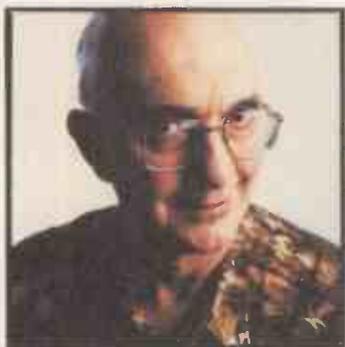


* Supported by "Bubble Jet Direct" compliant cameras only.



BUBBLE JET PRINTER
S820D

you can
Canon



My favourite things

It's not all bad... there are some things Barry Fox actually does like...

barryf@pcw.co.uk

Is there anything in the computer world that you actually like? A reader asked me last month (Letters, June 2002). That got me thinking, especially when he later admitted he has 'a fat pipe to the Internet (courtesy of my employer), a fairly reliable Hotmail account (courtesy of Mr Gates) and a bunch of system managers to sort out all my software problems.'

What I do like is hardware, software and systems that work, and companies that show interest when I find a problem. I have bought my last three PCs from Dell, because that way I am not paying for the help of often-ignorant shop staff.

I like Dos because it's like an old car engine you can get your hands on, not one with an electronic ignition. Dos programs run lightning fast on a modern PC because there are no fancy graphics to process. Batch-copying files with a *.* command is a darn sight easier than Control-clicking and ending up with copies of copies where I don't want them. And loads of businesses, which don't want their staff to play Windows games or hunt for porn on the net, like Dos too.

I still use the old Q&A Dos database because Symantec stopped further development before there was a halfway to usable Windows version. Every so often I export my data to a modern Windows program just to reassure myself that I am not missing anything.

I also like a printer with Dos drivers. After dropping Dos drivers, HP brought them back for some laser printers. The last I heard, Samsung was providing them too. But it doesn't like to admit it.

I most definitely like laser printers, especially HP's. Epson has just confirmed that there is nothing wrong with the Photo Stylus 790, which I bought to print colour when I really need to. It is quite normal for

the ink to dry and clog the heads if the printer is not used for a couple of weeks. It then has to gobble ink to clean the heads. I sometimes think it would be cheaper to support a drug habit than use a colour inkjet occasionally.

I like serial modems and ISDN terminal adaptors because the PC is less likely to 'lose' them than USB devices. I liked dealing with Elsa because its German head office seemed genuinely concerned when I pointed out that it was fitting faulty ISDN jack sockets. Most companies just wish I would drop dead when I tell them about a fault their quality control people should have spotted.

I like buying from stores. If the goods are faulty I can take them back, rather than wait on hold until Jungle's customer service line gives me authorisation to return an obviously dud hard drive.

I used to like buying from Tandy because it had a good range of little components and connectors. I now like Maplin for the same reason.

I liked Compuserve Classic and made the mistake of upgrading to CS 2000. Now I am where I have wanted to be ever since, on AOL with the same user name (barryphox@aol.com). I like AOL because it is bulletproof and you can usually get affordable help by phone. I used to like Freeserve until I tried to cancel my Anytime account. Has the company been taking lessons from Sky?

I love software that does a simple job well. Screenprint does what Windows should do, and prints a screen image from the Print Screen key. Likewise CloneCD is far easier to use than Roxio and Nero. Both Screenprint and CloneCD can be bought for peanuts at www.softwarelabs.com/tsi4/3-screenprint.htm and www.elby.org/CloneCD/english.

Most companies just wish I would drop dead when I tell them about a fault they should have spotted

I liked the Cardscan scanner so much I bought it after reviewing. It takes business cards, and scans and OCRs them, magically putting the names and phone numbers in the right fields. But you may have to hunt for one in the UK. At £200 the price is high, too. But it's worth the cost and effort.

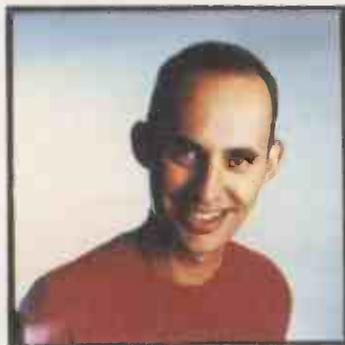
I like the Imation Flash Go US connector that reads all the current data card formats, without the need to connect a camera, data device or audio player.

Powerquest's Partition Magic is the only way to split a big hard disk into smaller partitions, for keeping a backup image file well clear of the operating system, for example. And version 7 works with XP. It makes FDisk look like a megaton bomb with a hair trigger.

I think I will like Powerquest's new and XP-compatible Driveimage 2002, as long as it copes with the EZ Bios overlay which Maxtor's hard disk installation software (Maxblast) just loves to put on disks, like fungus. Until Driveimage 2002 is available I will have to stick with Norton Ghost as the only bombproof backup – provided you are prepared to learn Dos and master Norton's user-hostile interface.

Although Ghost is a classic example of how to cripple excellent software with appalling get-up and documentation, Systemworks 2002, with Norton Utilities, and One Button Checkup, is an easy-to-use life-saver. Norton Anti-Virus will be good too, when Symantec makes it easier to pay for continued updates. Panda is good, but undersold. If I were a larger company I would choose Sophos.

Finally, I think I like XP. Despite refusing to recognise some of my older kit and making Dos programs a bit harder to use, it does feel like the most robust and stable Windows since 3.11. And that I really did like. **PCW**



nik_rawlinson@vnu.co.uk

Copyright or copy wrong?

As webcasters face the music they are in for a bleak future, says Nik Rawlinson

Are you listening to music? Through your PC? Switch it off for five minutes, would you? Just until you've finished this page. Thanks.

For three hours on 1 May the police and television crews buzzed their helicopters above our offices. They hung there like portents of doom, filming and observing the May Day protesters as they rolled steadily towards us.

Physical demonstrations took place around the world, but perhaps the most unusual protest of all occurred on the Internet. It was a peaceful protest – across the US the net went silent as online music stations from coast to coast either cut their output or opted into the Emergency Webcast Broadcasting System, a 24-hour talk show that ran for one day only. The focus of their protest was two-pronged: the US Copyright Office and the Digital Millennium Copyright Act (DMCA), which was passed by Congress in October 1998.

Traditional broadcasters in the US – the FM and AM stations – have only ever had to pay royalties to the composer of each track they play. For the digital broadcasters, though – those using satellite or the Internet rather than the airwaves – things look set to change.

In 1998, when the Bill was passed, Congress was concerned that the quality of many Internet streams would soon become so good that they could dent CD sales. A payment should therefore be made to compensate artists and record companies. Fair enough, said the stations. How about three per cent of the revenues we pay composers? The record companies shook their heads and asked for 15.

Neither party, it seemed, was going to compromise, so the US Copyright Office, charged with collecting the revenues, set up Carp, the Copyright Arbitration Royalty Panel. After six months of hearings, the

panel made its recommendation – Internet-only webcasting stations would have to pay 14 cents per track played for each listener and, because the Bill was passed in October 1998, the royalties would be backdated. The example on www.saveInternetradio.org puts things into context: a station broadcasting one hour of music (15 tracks) to 1,000 listeners would be required to pay royalties of \$21 (approx £15).

If you consider that webcasting is an as-yet unproven broadcast model, with few companies willing to pay to advertise on the medium, you start to see why online music stations are concerned that their future may be bleak. To make their point, they declared 1 May a 'Day of Silence'.

As always when a technology is still relatively young, the arguments for and against these new royalties are far from clear cut. You could argue that the recording artists should be compensated for their work and any losses that unregulated broadcasting could inflict upon their incomes. To counter this, many cite the fact that online broadcasting is pushing forward the adoption of broadband on a global scale.

Perhaps the most valid complaint, though, is that by imposing an arbitrary fee of 14 cents per track per listener the Copyright Office is not taking into account the size or income of each broadcaster – something both webcasters and record companies suggested in the first place.

The real worry, though, is that this law has not kept up with technology. When the DMCA was passed in 1998 webcasting was in its infancy and nobody really knew the implications of Internet radio stations, just as we didn't understand the effect of peer-to-peer networks.

But where peer-to-peer networking enabled potentially financially damaging

Online gambling sites moved to friendly shores, why should radio not do the same?

file-swapping, the reality is that online stations rarely rival the quality even of AM broadcasts, never mind FM. We are not tempted to rip their output as an MP3 to share with our friends or burn to disc in preference to paying for a new album. Artists are not being significantly harmed by having their work played online, indeed, some would say that the truth is precisely the opposite. Webcasting is the only chance some minority musicians have of any public recognition.

The Carp has passed its recommendation back to the Copyright Office, which will have made its ruling by the time you read this column. If it accepts the proposal then your favourite online station will probably still be on air. If it's American, though, within 45 days, the deadline for handing over its backdated royalties, it could disappear for good. Now you see why I asked you to switch off the music.

So, what does this mean for the UK? Well, apart from the fact that it could see a reduction in the choice of stations it could be good news. The ratio of European to US stations would grow, and a greater proportion of the global advertising spend could come our way. A knockback effect could also be that we see more stations hosted in Britain and other non-US territories. Online gambling sites moved to friendly shores, why should radio not do the same?

Many say that with the World Service Britain leads the way in global broadcasting. Perhaps the future lies in being home not only to a respected worldwide broadcaster, but also to the smaller stations of our planet. Whichever way, it can only be good news... unless and until a similar law is passed here.

That's fodder for a future column, though. For the moment, switch back on and listen while the music lasts. **PCW**

LOOK FORWARD



BTopenworld



Why wait?

Broadband high speed internet for just £29.99 a month with no internet call charges.

- Up to 10 times faster than a standard 56k modem.
- Talk and surf at the same time, so there's no need for a second phone line.*
- Faster downloads and high quality audio and video streaming.
- No time restrictions, no dial-up.
- **Order now at www.btopenworld.com/broadband**

Verbatim

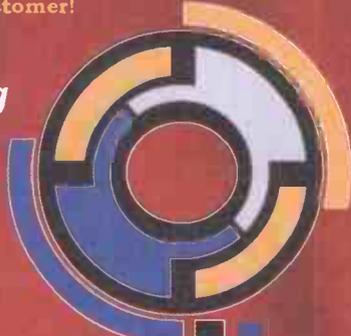


**Call the
Sales Team and
quote ref: VerTSTX5
when ordering to receive
your free t-shirt!**

0845 330 4500

t-shirts are available while stocks last. One t-shirt per customer!

*first4media is the UK's leading
media supplier. We stock:
Over 1900 products in
All brands all formats.*



first4media.com

The Home of Recordable Media!

LETTER OF THE MONTH

Oftel off-track on broadband >

BT's poor record in securing a take-up rate for ADSL comparable to that of, say, Germany or the US, has been the subject of much correspondence and editorial. May I contribute by discussing Oftel's failure to regulate the industry satisfactorily?

When I drew Oftel's attention to the fact that pricing for Internet access using ISDN is, for all but light usage, significantly higher than it would be for ADSL, it referred the matter back to BT. After some correspondence, the final statement from BT was 'unable to charge you a lower rental until ADSL becomes available in your area'. On telephoning Oftel the response was to the effect that BT is not obliged to submit pricing for 'add-on' services, such as ISDN or ADSL, to Oftel, and that Oftel would only deem to look at such pricing if it felt it was 'anti-competitive'.

This is a stunning admission and raises the question of who regulates the regulator? It is indisputable that there is a problem with the ADSL rollout and ISDN pricing for all

but light Internet usage is a matter of public record. It is also public knowledge that those of us in rural areas rely on BT for our copper connections for upstream connection to the Internet.

It is difficult to blame BT in this matter as it has a statutory duty to its shareholders to make as much money as it can get away with. But I do feel that, as consumers, we should start to hold Oftel and its parliamentary masters more accountable for the failure of the broadband market so far.

BT is very fond of quoting 60 per cent household availability. If a product is so available then the low take-up rate can only mean that BT either has a perverse definition of availability, or that the pricing is wrong (unless you are completely barmy and suggest that the British do not want broadband access when other markets do). If the pricing is so wrong or BT is so disingenuous, why won't Oftel and/or parliament do anything about it?

Bob Andersson

Leo lessons > The comments about the 'End for ICL' in the May issue (News, page 28) are not quite correct. ICL was formed by the merging of English Electric Leo Computers and ICT. English Electric (not English Electronics) was a large group, mainly involved with heavy electrical plant. ICT was formed by the merger of Powers Samas and British Tabulating Machines, both being manufacturers of punched card machines. Leo Computers was in a class by itself.

As early as 1947, J Lyons & Co. of teashop fame decided to install a computer in its head office for commercial applications. It had to build it in-house as the work at Ferranti and Manchester University

was on scientific machines. The world's first commercial machine, christened Lyons Electronic Office, was installed in 1951. The company Leo Computers was formed in 1954 and produced a series of very successful machines that ran throughout the 1950s and 1960s. Leo was acquired by the English Electric Company in 1963.

Justin Underwood

Dylan Armbrust replies > Thanks for the background history (and correction too). It just goes to show how fascinating the history and business of computers can be.

Mac attack > I was very disappointed that you gave the new IMac to a Windows XP user to review (PCW May 2002). He obviously wanted to give as negative an impression of the system as possible. For example: 'It is sadly let down by a lack of decent third-party software to deal with other aspects of productivity'. Examples please? For a start, users are not limited to Appleworks (which is bundled 'free' with the IMac). Microsoft offers Office X for Mac OS X (by its own admission, the best version of Office on any platform) and Office 2001 for Mac OS 9 or Classic mode.

OK, Access isn't available, but Filemaker is, and for very heavy duty use, 4D (plus the open-source MySQL and PostgreSQL). Omni Group make a pretty good outliner, Omni Outliner. There's some very nifty freeware and shareware out there for enhancing OS X as well, such as ASM, Tinkertool, Launchbar, Defaultfolder, and Fruitmenu.

Perhaps you should also tot up the value of some other things supplied free with the IMac, like Apple's full C/C++/Objective-C/Java/Applescript development suite, including an IDE and interface builder (install it using /Applications/Installers/Developer/Tools/Developer.mpkg, or from the Developer Tools CD if Mac OS X is bought separately). This is like Microsoft bundling Visual Studio with Windows. Networking is more sophisticated than Windows, and under OS X, users can now directly access Windows file sharing. Firewall software is also an intrinsic part of Apple's Unix-based networking code, not an add-on bundle.



WIN!

Each month we are giving away a set of Creative Inspire 5300 speakers to the author of the Letter of the Month.

Designed for enthusiastic gamers and other serious users in search of outstanding audio quality in

multimedia or DVD-based entertainment, the set consists of five satellite speakers producing a total of

30w (RMS), and an 18w (RMS) subwoofer. Used with an appropriate sound card, this speaker system will definitely get the pulse racing!

The design of the satellite speakers contributes to the user experience. Contoured face plates have been used to achieve remarkable sound dispersion, sound staging and positioning. As a result, users can be highly flexible in room layout and seating positions while enjoying maximum audio impact.

For the complete range of Creative's speakers, call 0800 973 069 or visit the website at <http://europe.creative.com>.

LETTERS

Please give the next Mac you review to someone who understands them. You don't do your reputation any good (except in the Wintel community) by printing biased articles.

Alun Carr

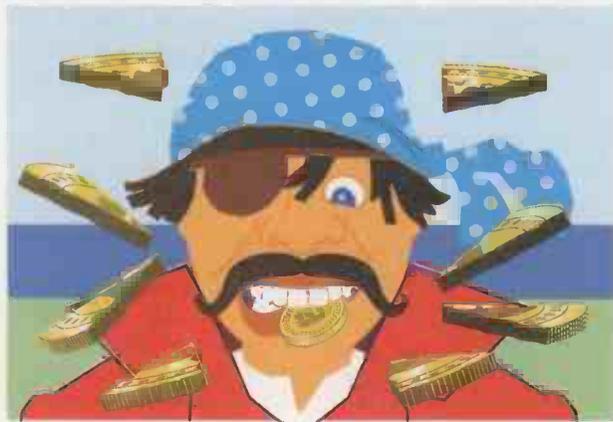
Andy Stewart replies > As someone who spends the majority of my working life using a Mac, I would consider myself an ideal candidate to review the latest iMac. However, I was conscious that the review could descend into Mac evangelism and so tried to remain as objective as possible.

I stand by the comments made about the lack of third-party software: there isn't any bundled with the iMac and, while there are Mac-flavoured versions of most leading software packages, these are invariably more expensive than their PC equivalents. Appleworks is adequate but Microsoft Office is better.

You're right to mention the iMac's added functionality, but Mac OS X's strength is surely its simple and intuitive interface – something that may not necessarily appeal to many PCW readers who are more concerned with tweaking their back ends and getting their hands dirty in the guts of a PC.

It is also for this reason that we compared the OS with Windows XP. These two operating systems have evolved to a point where they closely resemble each other. Microsoft's imitation is a glowing endorsement of Apple's hard work and indicative of the demand for multimedia functionality.

At the end of the day, if you are a Mac owner, then by all means consider upgrading to the iMac 2, but if you're a PC user there is little on offer that an upgrade to XP couldn't remedy.



Pieces of eight: Do 17th Century pirates hold the key to bits and bytes?

Spanish bits and bytes > I do not believe Mark McIntyre is entirely correct (Letters, Binary Bugs, May 2002). I believe the origin of the term 'byte' comes from the gold coin used in Spain in the 17th Century. These coins were often bitten into eight roughly equal segments, or 'bits' hence the term 'Pieces of eight'.

I'm uncertain why the word byte is spelled incorrectly, probably to make it less confusing in relation to the regular spelling, but I remember that because there were eight bits to one of these coins, the engineer who coined the phrase noticed the connection between eight binary units, and eight gold bits in the coin you would 'bite'.

The story may be completely untrue (and I can't find my original source) but it seems to be plausible enough. I believe any non-8bit unit in computing is more properly referred to as a 'word' – I know words are normally 16bit values, but I believe the length is variable.

John Cheseldine

Dylan Armbrust replies > Whatever the veracity of your story John, it certainly makes for a great tale and it also seems to fit the situation well.

You say data... > Unless my sources are wrong, the Norman invasion of England took place in 1066 and the original Domesday Book was compiled around 1086. This is 900 years earlier than the 1986 BBC Domesday Project, not 1,000 as your article 'Data that lasts' states (June issue, News, page 18,). The title of this piece is also a grammatical howler. 'Data' is a plural form, so it should have been 'Data that last'.

Sam Edge

Clive Akass replies > You've got me banged to rights on the anniversary – all that talk of the Millennium got me confused. But your second point is arguable. I refer you to *Chambers 21st Century Dictionary* which defines data as 'one or more pieces of information'. It adds: 'Originally plural but now generally treated as singular.'

I am all for precision in language, but I guarantee that just about every reader would have done a double take on either 'Datum that lasts' or 'Data that last', whereas our heading was immediately comprehensible. So I'm with *Chambers* on this one.

Speed and size matter > In Gordon Laing's Inside Information column (June, page 28), he concludes that remote control of PCs and mobile Internet access are both required. I agree, and for home access there are two other important factors to consider. Without cable or ADSL options being available to me, speedy Internet access is impossible (with satellite access being too costly at present). Then there is size.

Nobody seems to have quite got to grips with the ideal size for a convenient, home-access device. I for one would not be keen to lug around an LCD monitor, and PDAs are just too small for comfort. What home users require is an A4-sized device, probably set up in the landscape position, which can be used from an armchair. Perhaps some form of the Tablet PC will fill this need.

Ian Powell

Clarifications: June's brainteaser suffered from a glitch. The first clue should have read A1234 = 13. We apologise to readers who were stumped. We have repeated the brainteaser this month, so you have another chance to enter.

The Actiontec wireless-ready home gateway (June p53) has two Type II PC Card slots, not two Type I slots as published. Apologies for any confusion.

Send your letters to:

The Editor, PCW, VNU Business Publications,
32-34 Broadwick Street, London W1A 2HG
or email letters@pcw.co.uk

Unless otherwise stated, letters sent to the editor, PCW team or contributors will be considered for publication. Letters may be edited for clarity or length. Views expressed are those of the author and not necessarily those of the editorial team. If you wish your letter to be considered for the monthly prize, please include a full postal address for delivery. An email address alone is not sufficient.

TAKE CONTROL!

KVM SERVER MANAGEMENT

Control all your computers from a single keyboard, monitor & mouse, reducing space and saving money.

New!



eRIC: remote server administration

at any time and any place irrespective of the operating status of the server system. Secure unrestricted hardware-access via modem, ISDN or LAN/WAN on BIOS and boot screen. power on/off-button. OS independent. **From £499**

RackAccess:

Rackmountable keyboard and mouse drawer with 15" LCD Screen. **From £1,269**



The DS-Series digital switches

offer the optimal solution for enterprise-installations with real-time access over IP. **From £2,400**



Voyager 60/300 UTP Extender

extends your PCs keyboard, monitor and mouse up to 1000ft (300m) away over CAT5 cable. **From £269**



SoHo switches Dakota Scout Mini, Scout and Scout OSD:

extremely compact 2, 4, 8 port. 2-port version available with audio. **From £85**



AutoView 200/400:

multiuser and multiplatform, with built-in transmitter allowing one user to be 500ft (150m) away. **From £905**



UltraMatrix 2xE/4xE

allowing up to 4 users to simultaneously administrate more than 1000 computers. OS independent. **From £899**



Visit us at:

networks telecom europe



All Major Credit Cards accepted. All Prices exclude delivery and VAT. Delivery £10.00 Next Working Day. (Mainland UK Only) E&OE

Call 020 8438 3800
Fax 020 8438 3899

www.dakota.eu.com
info.uk@dakota.eu.com

Dakota Computer Solutions
4 Harp Business Centre, Apsley Way
London NW2 7LW



DAKOTA

THE BRAINS BEHIND
KVM SWITCHING & SHARING

HOW WE TEST

RESULTS EXPLAINED

When we're testing PCs, notebooks and components, we run benchmarks, which are explained below



Adobe Photoshop 6.0.1 is part of Sysmark 2002



3Dmark 2001 tests DirectX performance



Quake III: Team Arena tests OpenGL

Sysmark 2002

Sysmark 2002 is made up of 14 applications that are divided into two categories: office productivity and Internet content creation. A predefined script, with data, is run on each application at an execution speed that includes one-second pauses between operations to simulate human activity. Applications are run concurrently to reflect the way most people use PCs today.

The time taken for each application to complete an operation (ignoring keystrokes and mouse clicks) is recorded. Sysmark then calculates the geometric mean of the application times for each category, and converts these into a score for each of the two categories.

These scores are based on a comparison between the test system and a reference PC featuring a 1GHz Pentium III processor, an Intel 815EEA chipset motherboard, 256MB of PC133 SD-Ram, a 64MB Creative Geforce Annihilator 2 graphics card, a 30GB UltraDMA100 IBM hard disk and Windows XP. A score of 100 indicates that the test system has a performance equal to the reference PC, 200 indicates twice the performance and so on. An overall Sysmark score, the weighted geometric mean of the two category scores, is then calculated.

We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It loops three times, rebooting between each category. The applications are as follows:

Office productivity

Microsoft Word 2002
Microsoft Excel 2002
Microsoft Powerpoint 2002
Microsoft Outlook 2002

Microsoft Access 2002
Netscape Communicator 6.0
Dragon NaturallySpeaking Preferred v.5
Winzip 8.0
McAfee Virus Scan 5.13

Internet content creation

Adobe Photoshop 6.01
Adobe Premiere 6.0
Microsoft Windows Media Encoder 7.1
Macromedia Dreamweaver 4
Macromedia Flash 5

Sysmark 2002 is a commercial benchmark, available from Bapco at around £130 (www.bapco.com).

Quake III: Team Arena

We test OpenGL performance with Quake III: Team Arena (v.1.27g).

The settings are:
video mode: 1,280 x 1,024,
colour depth: 32bit, full screen,
highest texture detail,
texture quality: 32bit,
texture filter: trilinear, lighting
and lightmap.

Compressed textures: no
At the command prompt we type:
`timedemo 1`
`demo mpdemo 1`
This runs demo 1 and records the frames per second.

3Dmark 2001

This DirectX test runs three specially coded games at low and high detail. A fourth test only runs on cards that are fully compliant with DirectX 8. This results in higher scores being given to these cards than to others. The benchmark is also run at 1,280 x 1,024 in 32bit colour and textures, set to loop three times.

The result is calculated by adding together the average frame rate for

the first three games in low detail and multiplying by 10. The average frame rate for the fourth game, and the first three games in high detail are added together and multiplied by 20. Finally, the two scores are added together to produce the final result. The scores below, provided as a reference, should give you an idea how two different graphics chips perform under this test.

3Dmark 2001

6,467
0 1,000 3,000 5,000 7,000
ATI Radeon 8500

6,260
0 1,000 3,000 5,000 7,000
Asus V8200 Deluxe
(Geforce3 T1500)

Tested using 2GHz Pentium 4 (256KB of Level 2 cache), 256MB of PC800 RD-Ram, Windows XP

PCW

Seti@home

We occasionally use this test to give us a feel for the performance of a system. The test is very CPU intensive. We time how long it takes the Seti@home program to process the same one per

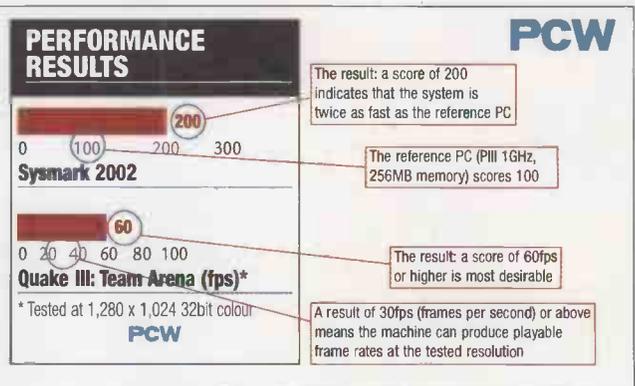
cent of the same work unit. As a reference, a PC with a 1GHz Pentium III and 512MB of PC133 memory takes nine minutes 40 seconds to complete the test. Another PC with two 933MHz Pentium IIIs, 256MB of PC800 Rambus takes four minutes.

3D Studio Max2

Some of the higher-end systems seem appropriate for 3D modeling. We have written a specific scene and time how long it takes for the system to render this.

Battery test

To get a feel for the length of time a battery will last on a notebook, we have a specific test. Based on a looping Excel Visual Basic application, it opens worksheets, generates random numbers and pivot tables, then zooms, and adjusts the brightness and contrast of an image. The application also includes 2D animation and periodically halts to simulate natural human pauses. The process is self-timing, with the running time recorded to disk every 30 seconds until the battery power diminishes.



For the heavy user,
gamer, broker,
your secretary,
people like you.

NEC

Our line of LCD products offers a suitable monitor for everyone: from models for the cost conscious like the 15inch MultiSync® LCD1550V to top innovative LCD monitors for use in financial services and stock market environments, or for graphics and desktop publishing. One thing is absolutely clear:

Quality is visible.

- display 90° rotatable (TORO design) and height adjustable
- up to 300 cd/m² brightness
- brilliant, true and accurate colours thanks to panels with integrated OmniColor™ technology (sRGB and 6 axis colour control)
- extremely narrow side frame for multi-monitor applications
- ergonomics and safety complying to the the highest industry standards (incl. ISO 13406-2 and TC099)
- digital and analog interface (ambix technology)
- individual adjustment of icon and type size with LiquidView™
- VESA mounting interface enables versatile installation
- Three years on-site warranty including the backlight



Quality is visible

08701 201160
www.nec-mitsubishi.com

NEC/MITSUBISHI
NEC-MITSUBISHI ELECTRONICS DISPLAY





Mark Walsh Reviews Editor

Reviews

Difficult decisions ahead for 'the new HP'

Just as we were going to press, HP announced details of its long, drawn-out merger with Compaq. The news was pre-empted by the tearing down of Compaq's websites, in favour of links to HP's. At the briefing the merged company was referred to as the 'new HP' – the word Compaq seemed to be taboo.

The main focus of the announcement was to emphasise the intent to 'lead change rather than be swallowed by it', and outline the fusion of products and brands to slim down the respective ranges into one byzantine bunch. The loss of the Jornada range, in favour of the more popular Ipaq, was the most prominent consumer product adjustment, and it was also stated that the company would be split into four sections to deal with distinct market areas.

In the past, Compaq has leant towards AMD chips over Intel, whereas the 'old HP' was strictly Intel only. So the question is: where will the 'new HP' get its chips from? Well, Intel has been making quite a comeback in recent months, with its price cuts and latest chip revisions making it far more appealing than before. Specifically this month these changes have brought us affordable Mobile P4 systems and the highest of high-end P4 PCs (including a spanking new 533MHz front-side bus) for less than £1,500 ex VAT.

Intel also feels the time is now right for the Celeron range to undergo a Pentium 4-like makeover. About time, we mutter. But there's no denying it is, and always has been, a strong contender in the budget

chip market. Turn over the page and see what Hi-Grade has built around this Celeron for just £799.

Armari's Liquid Cool system (p48) offers a couple more reasons for HP to consider sticking with Intel. Always one to give us the latest in high-brow tweaking technology, Armari has delivered a P4 system that has been overclocked to nearly 3GHz. 'Isn't that dangerous?' I hear you ask. Couldn't the heat do some serious damage to house and home if the PC was left for too long? Well, no, because besides the safety-conscious measures Armari has taken, the P4 chip includes a number of measures to prevent such a disaster. Thermal protection is in-built, a feature AMD chips lack, and the P4's deep pipeline means it's more tolerant of overclocking. The Northwood core shuts down automatically if the heatsink falls off, and it can scale up to 3.5GHz – 4GHz at a push. Conversely, AMD's Palamino core has pretty much reached the end of the road in that respect.

But AMD is far from dying away. For starters, the Mesh-built Athlon XP system (page 52) costs only £699 ex VAT and is just as well equipped as the more expensive Hi-Grade. With regard to new processors and updates, current rumours about AMD's 64bit Hammer processor suggest Intel will have its work cut out to beat that chip. Also, an early sample of the Thoroughbred revision to AMD's Athlon XP chip has reached our desks. It is very much scalable, and the mobile chip we received looks promising (see page 51), with desktop chips on their way to us next month. Only then will we, and probably the new HP, be a bit closer to deciding which chip maker to back.

CONTENTS

HARDWARE

- 46 Hi-Grade P4 Celeron desktop PC
- 47 Sony Mobile Pentium 4 notebook
- 48 Armari Liquid Cool system **EXCLUSIVE!**
- 51 NEC Athlon Thoroughbred notebook **EXCLUSIVE!**
- 52 Dell budget notebook

- 52 Mesh value £699 PC
- 55 IBM Mobile Pentium 4 notebook

PERIPHERALS

- 56 Toshiba Pocket PC
- 59 Creative MP3 jukebox
- 60 Logitech desktop speakers
- 61 Epson inkjet printer
- 61 Lexmark inkjet printer
- 64 Brother multifunction unit
- 64 Panasonic 3-in-1 gadget

- 66 Fujifilm digital camera
- 67 DAB digital radio card

SOFTWARE

- 69 Macromedia Fireworks MX
- 72 Macromedia Dreamweaver MX
- 77 Powerquest Drive Image 2002
- 78 Pure Motion Edit Studio 3
- 78 Lycoris Desktop/LX

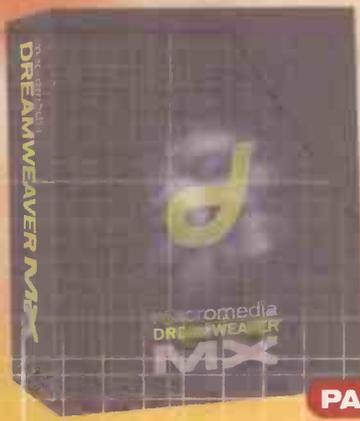
RATINGS

EXCELLENT ■■■■■ VERY GOOD ■■■■ GOOD ■■■■ BELOW AVERAGE ■■■ POOR ■■

REVIEWS



PAGE 66



PAGE 72



PAGE 59



PAGE 47

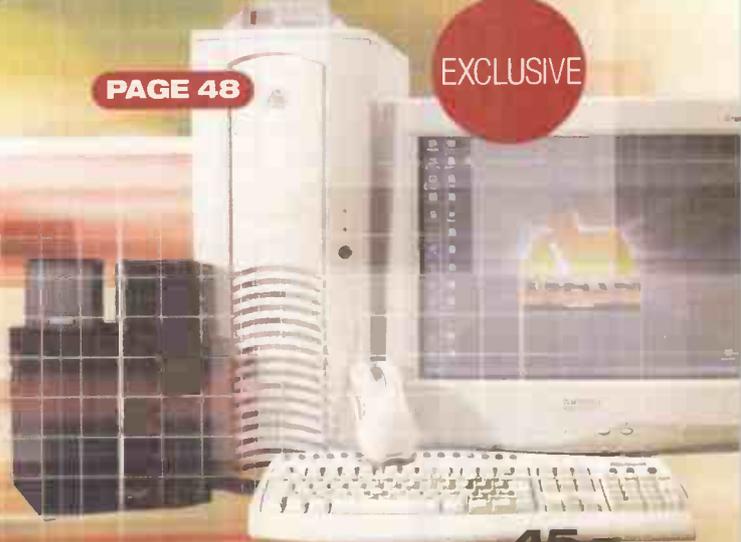
PAGE 56



PAGE 56



PAGE 48



EXCLUSIVE

The new case provides some interesting features, but the lack of separate sound card is disappointing



Hi-Grade P4 Celeron desktop

The Ultis P4 C17 PW07 is feature packed but comes in at a budget price

Traditionally, Intel has taken quite a beating when it comes to value, as its P4 chips, while remaining the fastest on the market, are a couple of hundred pounds more expensive than AMD's only slightly slower Athlon processors. However, at the budget end, roles are reversed, as the Celeron has been outclassing its AMD rival, the Duron, for many months. To do this, it has had to keep up with the times by, for example, breaking the Gigahertz barrier and adopting 0.13micron technology.

Inside this Hi-Grade Celeron system is the all new, singing and dancing Celeron chip, based on Pentium 4 architecture and clocking in at an impressive 1.7GHz – over 300MHz faster than its PIII-based Celeron predecessor. Costing just \$83 (£56), the modified Willamette chip retains its Socket 478 configuration, but has been 'dumbed down' to have a 100MHz system clock, and Level 2 cache has been slashed to just 128KB. Aside from this, there seem to be very few differences from the original 1.7GHz P4. Higher clock speeds will be released in the coming months.

The chip is wrapped up in a 533MHz MSI DDR motherboard and, coupled with 256MB of PC2100 DDR memory, it gave a perfectly decent Sysmark score of 138 overall, with some particularly impressive scores coming from the Internet content creation tests. While

these are not the highest scores we have seen from a sub-£800 system, this is the first time an Intel chip has offered such good value. This, coupled with price cuts for 'normal' Pentium 4 chips means Intel could easily win back the processor crown.

The system's innards have been neatly tied down, and there's plenty of space left to upgrade, including two spare Dimm memory slots, three PCI and two 5.25in bays. There are four USB ports, two at the front, two at the back, and the line-in and mic-out ports have been drafted over to the front as well.

The method by which this transfer has been achieved is sadly far from elegant: a large grey wire connects the external mini-jack ports of the motherboard to the rear, and blocks one of the PCI bays. However, the case does also allow you to do the same with a Firewire port, a real bonus for video-editing junkies.

ATI's 8500LE chip gives sufficient 3D performance for gamers. The card also offers DVI and S-Video outputs. 3Dmark 2001 performance on this occasion was 5,484, and Quake III tests gave us 73.8 frames per second (fps). The monitor is LG's 775FT. While its big brother the 795FT, is a superior model, with a better-looking fascia and a USB hub at the rear, the 775FT still offers excellent image quality and good looks.

Fitting into a £799 price bracket demands some sacrifices; this time it's the sound chip. The onboard chip provides a very respectable 5.1 output, which could easily do justice to games or the occasional DVD. But its quality just does not compare to that of a separate sound card. However, old favourites, Creative's DTT2200 speakers, adequately supply 5.1 sound.

Back on the positive side, the storage drives are of a high standard. A Maxtor 7,200rpm hard drive gives you 60GB of space; a size that is rapidly becoming the norm. The CD-RW drive whirs along at 24-speed, which is more than enough for most users.

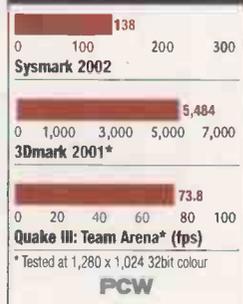
While this is a particularly solid system, and excellent value, when held up against the £100 cheaper AMD-based Mesh system (see page 52), it seems less palatable. Nevertheless, there are some pretty impressive components under this hood, and performance is excellent.

Mark Walsh

DETAILS

PRICE £938.83 (£799 ex VAT)
CONTACT Hi-Grade
 020 8532 6111 www.higrade.com
PROS Excellent value
CONS Sound is onboard
OVERALL Fast and feature packed, we haven't seen value like this from an Intel-based system for a very long time
SCORE ■■■■■

PERFORMANCE



SPECS

1.7GHz Intel Celeron processor • MSI motherboard with 533MHz 845E chipset • 256MB of PC2100 DDR SD-Ram • 60GB Maxtor hard drive • ATI 8500LE graphics card • 24x CD-RW • 16x 40x DVD • 56KB V.90 fax/modem • Windows XP Home • Microsoft Works V.6 • Norton Antivirus • One-year on-site warranty



The Vaio has a CD-RW/DVD combo drive and excellent battery life – impressive considering the £2,000 price tag

Sony Mobile Pentium 4 notebook

With its large screen and good battery life, this portable will do your desktop proud

If you believe that bigger is better, the new Pentium 4 Vaio from Sony will impress you. The PCG-GRX316MP has the biggest notebook screen in the business, measuring 16.1in, with a native UXGA resolution of 1,600 x 1,200, figures you typically associate with a 19in or 21in CRT monitor.

Backing up the display is a beefy 1.6GHz Mobile Pentium 4 processor and 256MB of DDR memory. There is a vacant memory slot under a large cover on the bottom of the Vaio, which can accept another 256MB module of DDR memory to give a total of 512MB.

This notebook is aimed squarely at the corporate market as a desktop replacement, so it could well end up running memory-intensive applications. It comes with Windows XP Professional, Norton Antivirus, WinDVD, Adobe Photoshop Elements and Adobe Premiere 6 LE, but no office suite. As this is designed for corporate desktop replacement use, we consider the choice of video rather than office software a poor one. However, it is far superior to nearly all other Mobile P4 systems we have seen.

That huge screen is driven by ATI Mobility Radeon 7500 graphics with 32MB of memory. Our graphics test results were perfectly acceptable with a 3Dmark 2001 score of 2,137, and a Quake III Team Arena frame rate of 32.5fps (frames per second). Hence, there's no reason not to use

this notebook for gaming in your idle moments.

The Sysmark 2002 score of 138 is also impressive, although we've seen higher scores from other Mobile Pentium 4 notebooks (see this month's group test). However, there was a distinct disparity between Internet and office scores, which were 195 and 98 respectively.

Battery life can make or break a notebook. We were pleased that the lithium-ion battery lasted for two hours nine minutes in our own PCW Excel-based test. That's nowhere near the three hours 34 minutes of the PIII-based Vaio PCG-SRX41P we reviewed last month, but it's the longest we've seen from a Mobile Pentium 4-based notebook and particularly impressive considering the huge screen.

Usability and ergonomics are of prime importance, of course, and the look of the screen and feel of the keyboard are good. If you type heavily the keyboard flexes slightly, but in regular use it's absolutely fine. Travel and response are perfectly adequate. The touchpad and mouse buttons are up to Sony's usual standard. They are the same as every other Vaio, and as such better than most of the competition. Beneath the mouse buttons there's also a jog dial and Internet Back button.

A variety of ports litter the notebook's sides. There are three USB ports in total (one on the left, one on the

right and one on the back), as well as a headphone jack, a microphone jack, one iLink/Firewire, Lan, modem, VGA out, TV-out, parallel port and S/PDIF (Sony/Philips Digital Interface). The ports are tidily tucked away behind plastic flaps. There are two Type II PC Card slots (which can take a single Type III card) and, inevitably, there's a Memory Stick slot.

Should you feel that's not enough, you can plug in a PCGA-PRGX1 port replicator to add a serial port and two more USB ports, but this will set you back £119 ex VAT.

Rounding off the hardware spec there's a Sony CRX810E combo drive rated at eight-speed DVD-Rom, 16x 10x 24x CD-RW and a 30GB hard drive.

The PCG-GRX316MP isn't really portable enough for those on the road all the time. It also lacks wireless Lan and infra-red which could be a problem for some users. It is a good desktop replacement notebook, particularly for its large screen and long battery life.

Leo Waldock

SPECS

1.6GHz Mobile Pentium 4 processor • 256MB of DDR Ram • Intel 845 chipset • 16.1in UXGA monitor • 1,600 x 1,200 resolution • 30GB UltraDMA100 hard drive • ATI Mobility Radeon 7500 graphics chip • Yamaha AC-XG WDM sound chip • 16x CD-RW/DVD combo drive • Windows XP Professional • Weight 3.8kg

DETAILS

PRICE £2,002 (£1,704 ex VAT)

CONTACT Sony 08705 424 424

www.vaio.sony-europe.com

PROS Enormous screen; excellent performance; good battery life

CONS No office suite; big and heavy; no wireless Lan

OVERALL While the Vaio is physically large and quite heavy, it's still pretty good looking and delivers excellent battery life.

For just over £2,000, it's a very good all-round package and the screen is impressive

SCORE ■■■■■

PERFORMANCE

138

0 100 200 300

Sysmark 2002

2,137

0 1,000 3,000 5,000 7,000

3Dmark 2001*

32.5

0 20 40 60 80 100

Quake III: Team Arena* (fps)

2:09

0 0:30 1:00 1:30 2:00 2:30

Battery life (hours & mins)

* Tested at 1,280 x 1,024 32bit colour

PCW

EXCLUSIVE



The Armari has a series of tubes through which liquid is pumped to cool the processor, graphics chip and northbridge



Armari Liquid Cool system

Overclocked to nearly 3GHz, the innards of this R833 LFC24 still keep their cool

You may have seen pictures of processor overclocking disasters – using liquid nitrogen to cool it down, or frying an egg on it are our current favourites. But in place of this tomfoolery, Armari's R833 LFC24 takes a more sensible and practical approach, and still manages to overclock its processor to nearly 3GHz.

To cope with the extreme heat given off by the overclocked chip, Armari has installed a series of plastic tubes through which liquid is pumped over the processor, chipset and graphics chip to cool them. The apparatus used is made by Koolance, and is available separately from www.overclockingstore.co.uk.

Inside the tubes used in the R833 is an inert Hydro-Carbon Fluorinet electrical cooling fluid. Armari doesn't sell the cooling device separately, however off the shelf the device uses water as its coolant. Water easily collects ions, which make it conductive, heating it up – not ideal when it's acting as a coolant.

The pumping action takes a few moments to start up once the PC has been turned on, but failsafes are in place to prevent the system overheating and melting the components or even catching fire. Internal temperature can be easily monitored from the LED display on top of the system box.

On average the system runs at a remarkably cool 35 degrees Celsius,

which, incidentally, is significantly less than that of your average system. The bog-standard 2.4GHz Pentium 4 processor has been overclocked to 2.95GHz. This was done by adjusting the Bios FSB (front-side bus) settings; the amount it is overclocked is left up to the user. Our hope was to tweak it so it broke the 3GHz barrier, but Armari says this would require modifications to the motherboard and processor's voltage supplies that would have voided their warranties. You are welcome to perform such actions yourself, though, as long as you are aware that the component warranties will be voided.

Asus's P4S533 motherboard is one of the first capable of supporting DDR400 memory, but has been fitted with 512MB of PC2700 DDR SD-Ram. While this is a slight disappointment, as faster memory would have boosted performance, the option is at least there for upgrade at a later date.

Sysmark performance is quite phenomenal. Clocking in at a whopping 274 overall, Internet content scores were quite startling at 380. This is the highest score ever produced in our labs, beating the previous record holder, a dual-processor, Hyper-threaded Armari system, at 259.

As the graphics chip is also being cooled it too has been overclocked, although only lightly. The Visiontek Geforce4 4600 card has been boosted to just five per cent over the factory norm,

as time would not permit further testing. Nevertheless, it broke our labs 3Dmark record too, giving us 9,480. Quake III was high, but slightly less impressive, at 132.2 frames per second (fps).

The surrounding components are of excellent quality too. The stunning graphics are piped through to a good-quality NEC-Mitsubishi 19in monitor, and the 120GB Western Digital hard drive and optical drives are ultra-fast SCSI affairs – a fact that doubtless aided Sysmark performance. However, there is no separate sound card, only a six-channel C-media chip from the motherboard, and Creative SW320 speakers. With its £2,500-plus asking price, we did expect top-notch components across the board, but as this is not a multimedia-orientated system, the lack of quality audio components is more excusable.

Not only is this PC a technical marvel, it is also a stable, incredibly fast overclocked system. It's a shame this performance comes at such a high price.

Mark Walsh

DETAILS

PRICE £2,696.63 (£2,295 ex VAT)

CONTACT Armari 020 8993 4111

www.armari.com

PROS Very, very fast

CONS Pricey; poor sound

OVERALL With sky-high performance scores but a price to match, this is a stable and well thought out overclocker's dream. And, as a rather bizarre added bonus, the Koolance system, and particularly the flow of liquid around the case, somehow manages to make your PC look interesting

SCORE ■■■■■

PERFORMANCE

0 100 200 300 **274**

Sysmark 2002

0 3,000 6,000 9,000 12,000 **9,480**

3Dmark 2001*

0 30 60 90 120 150 **132.2**

Quake III: Team Arena* (fps)

* Tested at 1,280 x 1,024 32bit colour

PCW

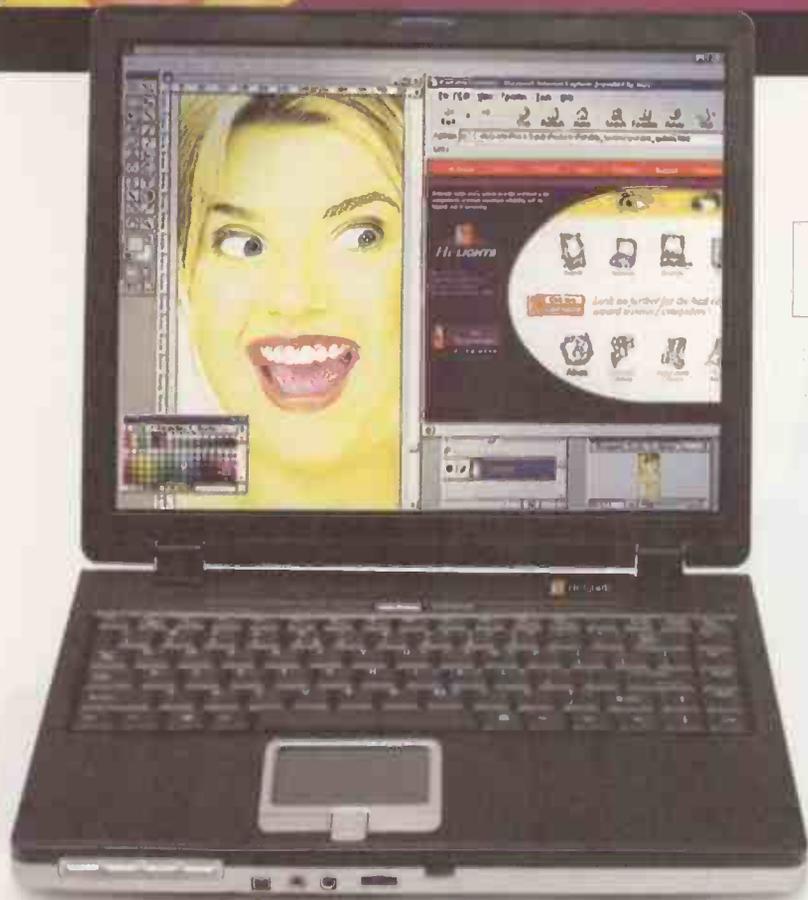
SPECS

Intel P4 2.4GHz • Asus P4S533 motherboard (with onboard C-media sound chip) • 512MB of PC2700 DDR SD-Ram • Visiontek Xtasy Geforce4 4600 graphics card • NEC-Mitsubishi Diamond Pro 920 19in monitor • 120GB hard disk • 40x CD-RW drive • 16x DVD drive • Creative SW320 speakers • Windows XP Professional

LOOK NO FURTHER

Tough, light and powerful

Road ready mobile PC



HI-GRADE
NOTINO R5400-1400



Mobile Intel® Pentium® 4 processor 1.4GHz - M
• built on .13 micron technology • includes
512K cache • supports Enhanced Intel® SpeedStep™ Technology*

VIA P4N266 chipset

256Mb DDR DRAM

30Gb hard disk drive

14.1" TFT XGA colour screen

Integrated 128-bit Ultra AGP 3D graphics chip
shares system RAM

8x DVD-ROM drive

Internal 56K V90 modem

Internal 10/100 Base-T Ethernet

Microsoft® Worksuite® 2002

Carry case

£1099
ex VAT

£1291³³
inc VAT

HI-GRADE NOTINO R5400-1800

Specification as the Notino R5400-1400 but with:

- Mobile Intel® Pentium® 4 processor 1.8GHz - M • built on .13 micron technology
- includes 512K cache • supports Enhanced Intel® SpeedStep™ Technology*
- 40Gb hard disk drive • 8x/8x/32x/8x DVD-ROM/CD-ReWriter combo

£1399
ex VAT

£1643⁸³
inc VAT

12 MONTHS
INTEREST FREE CREDIT

2 YEARS WARRANTY
WITH ACCIDENTAL DAMAGE



STANDARD NOTINO R5400 FEATURES

External USB floppy disk drive (optional) • Li-ion battery 6 cells
43.2Wh (~ 2.5 hours) • 1 PC-card slot, mini PCI slot for optional
wireless card or Bluetooth, VGA for external monitor, 2 USB ports,
IrDA port, IEEE 1394 port, speaker out, mic-in, TV-out • Dimensions:
312.5 x 257 x 30 - 35.3mm • Weight: 2.6kg • Semi-ruggedised
casing for extra durability • spill-proof keyboard • Microsoft®
Windows® XP Home Edition • Microsoft® Worksuite® 2002

Hi-Grade PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell



Hi-Grade

Technology with a human face

FOR A DEMONSTRATION CALL YOUR NEAREST OFFICE

London

Scotland

Southampton

020 8532 6123

01786 447130

02380 240399

...FOR LATEST PRICES AND MORE CONFIGURATIONS

call **0800 0740403** or visit

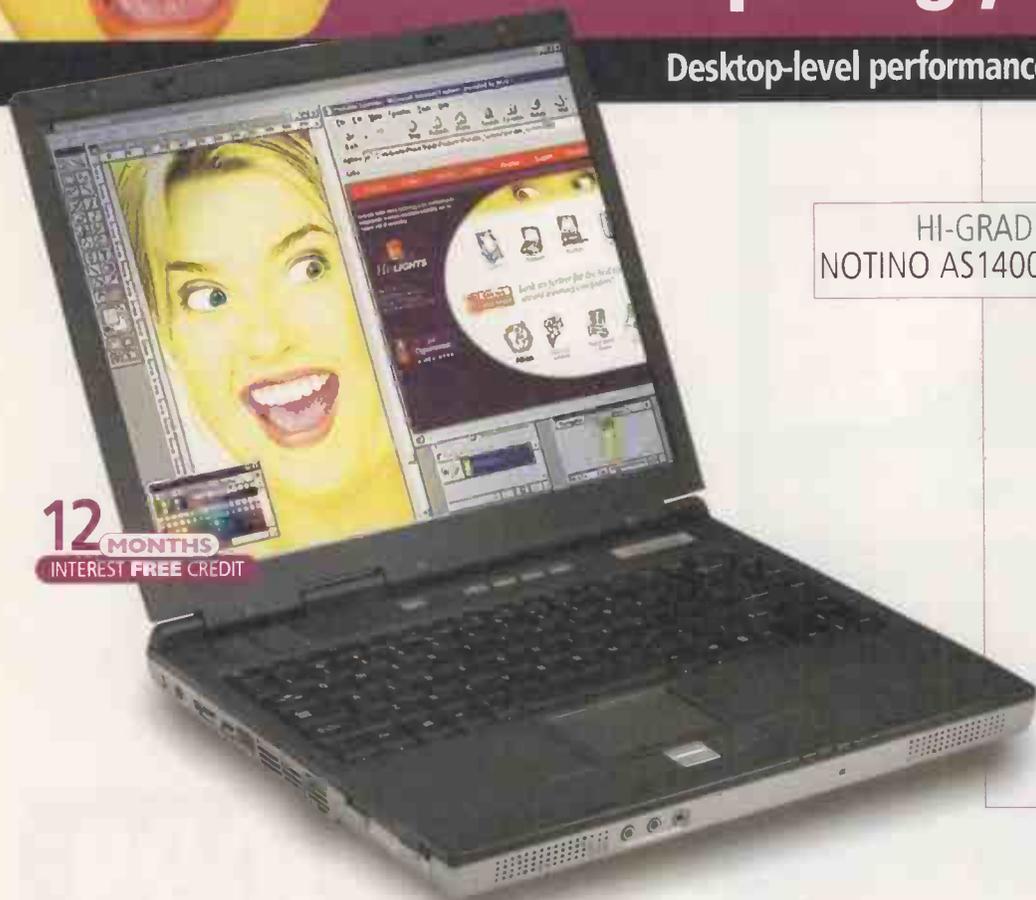
www.higrade.com

Finance options Personal Finance 12 months Interest Free Option. Typical example. Cash price £1300. 10% deposit £130, then either pay 48 monthly payments of £39.69, total amount payable £1905.12 APR 29.8% (interest is calculated from the day you sign the credit agreement) OR alternatively pay 11 monthly payments of £39.69 and if you pay the balance of the cash price in full within 12 months of the date of the credit agreement then we will waive any interest, total amount payable £1300. Written quotations are available on request. Credit is subject to status and available only to persons aged 18 years or over. Business Finance typical example. Total cash price £2000+VAT. Deposit £204.80+VAT followed by 11 quarterly payments of £204.80+VAT. Warranty options three year world collect and deliver warranty - 1 year extended warranty in addition to the standard 2 year warranty including accidental damage for UK residents £75+VAT. Terms & conditions Prices valid from 20.05.02. Delivery charge for all orders within the UK is £29+VAT. Hard drive: 1Gb means 1,000,000,000 bytes; total accessible capacity varies depending on operating environment. Modems: Maximum data transfer rate is dependent on certain factors including telephone lines, communication software and communication protocol. LCD Screens: Warranty covers 5 dead pixels or more than 2 parts of adjacent pixels. *The processor may be reduced to a lower operating speed when operating on battery power. Hi-Grade and Notino are registered trademarks of Hi-Grade Computers plc. Intel, Intel Inside, the Intel Inside Logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, Windows and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Prices and specification may be changed without notice.

LOOK NO FURTHER

Compact, portable package at a surprisingly low price

Desktop-level performance and functionality



12 MONTHS
INTEREST FREE CREDIT

HI-GRADE
NOTINO AS1400-1060A

Mobile Intel® Celeron® processor 1.06GHz with 256K cache

Intel® 830MG

256Mb SDRAM

20Gb hard disk drive

14.1" TFT XGA colour screen

Intel® 830MG embedded graphics

Internal 8x DVD-ROM drive

Built-in data/fax modem

Built-in 10/100 Base-T Ethernet

Carry case

Microsoft® Worksuite® 2002

£949
ex VAT

2 YEARS WARRANTY
WITH ACCIDENTAL DAMAGE

£1115.08
inc VAT

HI-GRADE NOTINO AS1400-1200

Specification as the Notino AS1400-1060A but with:

- Mobile Intel® Pentium® III processor 1.2GHz - M • built on .13 micron technology
- includes 512K cache • supports Enhanced Intel® SpeedStep™ Technology*
- 256Mb RAM • 30Gb hard disk drive

£1099 ex VAT **£1291.33** inc VAT



STANDARD NOTINO AS1400 FEATURES

- External USB floppy disk drive • Li-ion 8 cell battery (~2.5 hours)
- 1 PC-card slot • VGA for external monitor • Ports: 3x USB, IEEE 1394, speaker-out, mic-in, line-in, TV-out, parallel port, IrDA, Ai-box connector • Dimensions: 310 x 259 x 30.7mm • Weight: 2.7kg • Microsoft® Windows® XP Home Edition • Microsoft® Worksuite® 2002 • 2 years collect and return warranty with accidental damage

HI-GRADE NOTINO AS1400-1200-1

Specification as the Notino AS1400-1200 but with:

- 40Gb hard disk drive • 8x/8x/32x8x DVD-ROM/CD-ReWriter combo

£1199 ex VAT **£1408.83** inc VAT

Hi-Grade PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell



Technology with a human face

FOR A DEMONSTRATION CALL YOUR NEAREST OFFICE
London ■ Scotland ■ Southampton
020 8532 6123 01786 447130 02380 240399

...FOR LATEST PRICES AND MORE CONFIGURATIONS
call **08000740403** or visit www.higrade.com

Finance options Personal Finance 12 months Interest Free Option. Typical example: Cash price £1300, 10% deposit £130, then either pay 48 monthly payments of £39.69, total amount payable £1905 12 APR 29.8% (interest is calculated from the day you sign the credit agreement) OR alternatively, pay 11 monthly payments of £39.69 and if you pay the balance of the cash price in full within 12 months of the date of the credit agreement then we will waive any interest, total amount payable £1300. Written quotations are available on request. Credit is subject to status and available only to persons aged 18 years or over. Business Finance Typical example: Total cash price £2000+VAT. Deposit £204.80+VAT followed by 11 quarterly payments of £204.80+VAT. Warranty options Three year world collect and deliver warranty - 1 year extended warranty in addition to the standard 2 year warranty including accidental damage for UK residents £75+VAT. Terms & conditions Prices valid from 20.05.02. Delivery charge for all orders within the UK is £29+VAT. Hard drive: Go means 1,000,000,000 bytes: total accessible capacity varies depending on operating environment. Modems: Maximum data transfer rate is dependant on certain factors including telephone lines, communication software and communication protocol. LCD screens: Warranty covers 5 dead pixels or more than 2 pairs of adjacent pixels. *The processor may be reduced to a lower operating speed when operating on battery power. Hi-Grade and Notino are registered trademarks of Hi-Grade Computers plc. Intel, Intel Inside, the Intel Inside Logo, Pentium, Celeron and SpeedStep are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, Windows and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Prices and specification may be changed without notice.

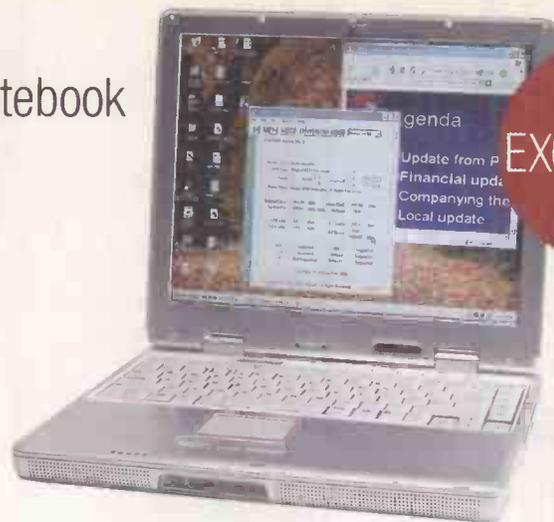
NEC Athlon Thoroughbred notebook

The Versa C180 houses AMD's latest processor

Codenamed Thoroughbred, AMD's latest revamp to its Athlon XP range makes its first appearance on these shores as a 1600+ mobile chip that clocks in at 1.4GHz. With a 200MHz clock and 256KB of Level 2 cache to its name, this chip also uses 0.13micron technology, something Intel adopted late last year.

NEC is the first company to get its hands on AMD's latest chip. This pre-production notebook comes with a new chassis, called the Mangusta. Its 14in TFT screen is pretty impressive to look at, but can only handle resolutions of up to 1,024 x 768. Graphics are onboard and fed by 32MB of the 256MB of system memory, and so are nothing to write home about.

The hard drive is adequate at 30GB, and the eight-speed CD-RW/DVD combo drive is an excellent inclusion considering the overall cost. The rather odd absence of floppy drive is made up for by four USB ports and a Firewire



EXCLUSIVE

DETAILS

PRICE £1,056.33 (£899 ex VAT)

CONTACT NEC 0870 0106 322

www.nec.co.uk

PROS Excellent value

CONS Battery life is currently horrendous

OVERALL Fitting AMD's latest mobile processor into a £900 notebook is very impressive, but battery life is our major concern

SCORE ■■■■

connection. Modem, network and Type II PC Card slots are also supplied.

Even despite the hindrance of SD-Ram over the more often favoured DDR SD-Ram, we expected this chip to fly. But initial indications showed it would be a little slower than a 1.6GHz Mobile Pentium 4 chip – a little disappointing but more than adequate. However, this model is almost as well equipped as Dell's P4 system (see page 52) and around £500 cheaper, and as such is a real bargain.

Our main concern here though was the battery life. AMD's Powernow

power management software was missing so the scores obtained were appalling. This omission will be rectified by the time the notebook is released, and we can only hope that it can make enough of a difference to make this a practical, portable option.

Mark Walsh

SPECS

AMD mobile Athlon XP 1.6GHz processor
• Via Twister-K KN133 chipset • 128MB of PC133 SD-Ram • 30GB hard drive • CD-RW/DVD combo drive • S3 Savage4 graphics • 14in TFT XGA screen • 3.4kg

Task-IT 2.4GHz PC

An impressive machine for the power-hungry user

The Predator 2.4 is by far the most impressive machine we've seen from Task-IT, and the first computer on test to contain a Pentium 4 with a 533MHz front-side bus (FSB). The previous version's FSB was set at 400MHz, so in theory this new chip can be up to a third faster.

Aside from bus size, though, there have been no real changes to the chip. It's still based on the Northwood core, with 512KB of Level 2 cache. And like its predecessor, it clocks in at 2.4GHz, but the supporting chipset is the i850E. This is an improved version of the i850 that supports the new bus speed.

If you're familiar with the i850 chipset you'll know it uses dual-channel RD-Ram. This has not changed and neither has the speed of the memory, as it comes fitted with two sticks of 128MB PC800 RD-Ram in two of the four Dimm slots. The Intel motherboard comes with onboard Ethernet and



is fitted with an NEC USB2 controller chip with two USB2 ports around the back, with another two at the front. A host of other quality components has also been fitted. A 7,200rpm Maxtor hard disk is the main storage drive and is well proportioned at 60GB, but far from huge by today's standard.

The Predator 2.4 is an incredibly fast PC, scoring 243 in our Sysmark 2002 tests. It's also a very capable gaming system managing 8,484 in 3Dmark 2001 as well as 117.4fps (frames per

second) in Quake III Team Arena. At £1,499 ex VAT, the Predator 2.4 isn't cheap, but it has a lot to offer the power-hungry user.

Lars-Goran Nilsson

DETAILS

PRICE £1,761.33 (£1,499 ex VAT)

CONTACT Task-IT 01442 233 573

www.task-it.co.uk

PROS Very fast; USB2-equipped

CONS The case feels cheap for this price point

OVERALL A great machine if you have cash to spare, but it would've looked better in a different case

SCORE ■■■■

PERFORMANCE

243
0 100 200 300
Sysmark 2002

8,484
0 2,500 5,000 7,500 10,000
3Dmark 2001*

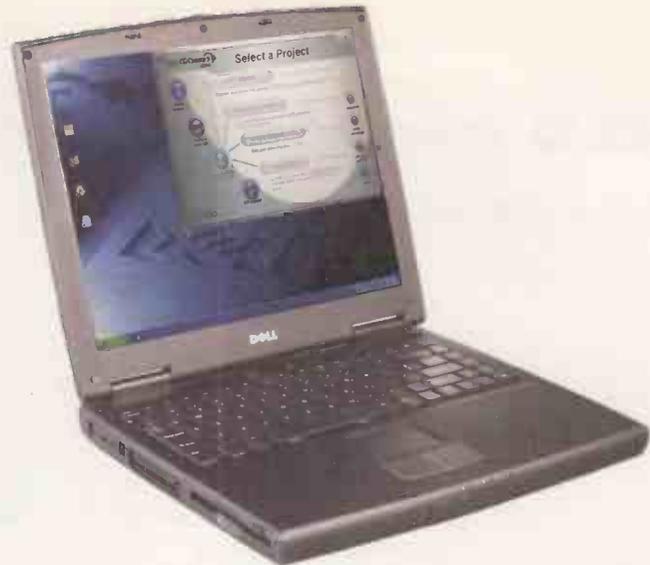
117.4
0 30 60 90 120 150
Quake III: Team Arena* (fps)

*Tested at 1,280 x 1,024 32bit colour

PCW

Dell P4 notebook

The Mobile P4 has become more affordable



DETAILS

PRICE £1,643.83 (£1,399 ex VAT)
CONTACT Dell 0870 907 5664
www.dell.co.uk

PROS Reasonable price for a mobile Pentium 4 notebook
CONS Poor battery life; lacks a few basic features
OVERALL Not bad for a basic Mobile Pentium 4 notebook, but battery life needs improvement
SCORE ■■■■

PERFORMANCE

Sysmark 2002
 0 100 200 300
 145

Battery life (hours & mins)
 0 0:30 1:00 1:30 2:00 2:30
 1:27

PCW

Two months ago we took a look at the first notebooks to contain Intel's Mobile Pentium 4 chip. The two problems that stood out were the price and poor battery life. Dell has managed to rectify the first of these issues with the Inspiron 2650, as it's more than £700 cheaper than the model we looked at in the May issue.

Packed with a 1.6GHz P4-M processor and 256MB of PC2100 memory, Sysmark performance is reasonable, if slightly lower than we would expect, coming in at 145.

A 16MB Geforce2 Go graphics card caters for those who need portable 3D performance. However, the display is a 15in TFT unit capable of resolutions up to 1,024 x 768 and so could not run our graphics tests. However, it is good quality with bold and sharp colours.

The chassis has been redesigned; it's still a three-spindle design so you get everything you'll need as standard. Dell has even managed to squeeze in a DVD CD-RW combo drive at this

price, as well as a 30GB hard drive. Other standard features include built-in modem, 10/100Mbit Ethernet, two USB ports, a single PS/2 port, parallel port, and a Dsub for connecting to an external monitor as well as a single Type II PC Card slot.

The keyboard is well laid out, although the Windows key has been relocated to the top right-hand corner, the touchpad is unresponsive and the buttons are a bit stiff.

The problem of the poor battery life has not been resolved. In our tests the review unit lasted one hour and 27

minutes, but this is still disappointing and makes it a poor choice if you're looking for a notebook to use on the move. But for those prepared to trade performance scores for portability, it is quite a bargain.

Lars-Goran Nilsson

SPECS

1.6GHz Mobile Pentium 4 processor • 256MB of PC2100 DDR SD-Ram • Intel 845MHz chipset • 30GB IBM hard disk • 16x CD-RW/DVD • Geforce2 Go 16MB graphics • Intel AC97 sound chip • Windows XP Home Edition • Microsoft Office XP • Actontec V.92 56K modem • 3.3kg

Mesh value PC

A high-quality system at a good price



DETAILS

PRICE £821.33 (£699 ex VAT)
CONTACT Mesh 020 8208 4744
www.meshcomputers.com

PROS Price; good upgrade path
CONS Below average monitor
OVERALL A very impressive showing for £699, despite slight cost cutting in some areas
SCORE ■■■■

PERFORMANCE

Sysmark 2002
 0 100 200 300
 167

3Dmark 2001*
 0 1,000 3,000 5,000 7,000
 4,211

Quake III: Team Arena* (fps)
 0 20 40 60 80 100
 69

* Tested at 1,280 x 1,024 32bit colour
 PCW

The Mesh Matrix XP 1800+SB is a gem, as it's a high-quality computer at a bargain price. The processor is an AMD Athlon 1800+, which, together with 256MB of PC2100 DDR SD-Ram, is fitted to an Asus A7V333 motherboard. The choice of motherboard makes this system reasonably future proof as it is compatible with PC2700 memory. Sysmark performance is impressive, giving an overall score of 167.

The motherboard features four standard USB1 ports, two USB2 ports, and an optional bracket for another two USB2 ports is also available.

The motherboard's C-media chip delivers six-channel audio as standard. Sound tends to be the first thing to lose out to a price point, although sound quality is better than expected. It is channelled through Creative FPS1600 speakers. These may not be the optimal choice considering the 5.1 sound chip, but they are still

reasonable. All storage and optical drives are high quality, particularly the Teac 40-speed CD-RW. The only fault with the Matrix XP 1800+SB is the monitor. The 17in NEC Multisync 75F is limited to a maximum resolution of 1,152 x 864 at 75Hz and could not run our graphics tests at the desired resolution. Picture quality is poor too, but it could have been worse.

Graphics comes from a Leadtek card, based on the Nvidia Geforce4 MX440 chipset and performance is reasonable, despite the attached

monitor. Overall, this is a good buy if you want a bargain upgradeable PC, and Mesh's three-year warranty makes it a more secure purchase.

Lars-Goran Nilsson

SPECS

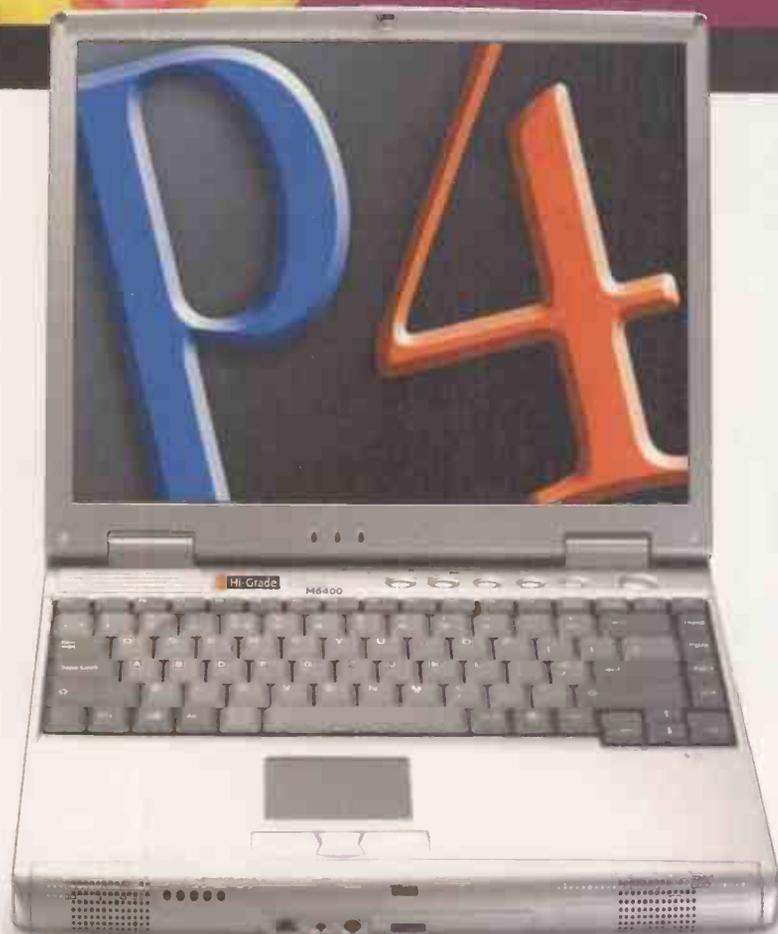
AMD Athlon 1800+ • 256MB of PC2100 DDR SD-Ram • Asus A7V333 motherboard (C-media sound chip onboard) • 40GB hard drive • 40x 12x 48x CD-RW • 16x DVD-Rom • Leadtek Geforce4 MX440 graphics card • 17in NEC Multisync 75F monitor • Creative FPS1600 speakers • 56K V.90 modem

LOOK NO FURTHER

"A classy notebook"

Computer Buyer, 05.02

"Blisteringly fast" PC Plus, 05.02



Intel® Celeron® processor 1.7GHz with 128K cache

HI-GRADE
ULTINOTE M6400-1700A

Intel® 845 chipset

256Mb RAM

20Gb hard disk drive

14.1" TFT XGA colour LCD

ATI Mobility M6-M 16Mb DDR

Internal 8x DVD-ROM drive

Built-in data/fax modem

Built-in 10/100 Base-T Ethernet

Carry case

£999
ex VAT

£1173⁸³
inc VAT

12 MONTHS
INTEREST FREE CREDIT

2 YEARS WARRANTY
WITH ACCIDENTAL DAMAGE

HI-GRADE ULTINOTE M6400-1800

Specification as the UltiNote M6400-1700A but with:

Intel® Pentium® 4 processor 1.8 GHz with 512K cache • 30Gb hard disk drive
• 8x/8x/32x/8x DVD-ROM/CD-Rewriter combo

£1199 ex VAT £1408⁸³ inc VAT

HI-GRADE ULTINOTE M6400-2000

Specification as the UltiNote M6400-1800 but with:

Intel® Pentium® 4 processor 2.0 GHz with 512K cache • 512Mb RAM
• 40Gb hard disk drive

£1349 ex VAT £1585⁰⁸ inc VAT

LATEST AWARDS

UltiNote M6400-1800-2
What PC? Best Buy
April 2002

UltiNote M6400-1800-1
PC Advisor Best Buy
May 2002

UltiNote M6400
Computer Buyer
Top 50 Best Buy



STANDARD ULTINOTE M6400 FEATURES

External USB floppy disk drive (optional) • Li-ion battery 9 cells (1.5 - 2 hours) • 2 type PC-card slots, VGA for external monitor, 2 USB ports, IEEE 1394 port, audio-out (SPDIF), mic-in, TV-out, IR port, parallel port • Dimensions: 313 x 263 x 38mm • Weight: 2.95kg • Microsoft® Windows® XP Home Edition • Microsoft® Worksuite® 2002 • 2 years collect and return warranty with accidental damage

Hi-Grade PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell

 **Hi-Grade**
Technology with a human face.

FOR A DEMONSTRATION CALL YOUR NEAREST OFFICE
London ■ Scotland ■ Southampton
020 8532 6123 01786 447130 02380 240399

...FOR LATEST PRICES AND MORE CONFIGURATIONS
call **08000740403** or visit
www.higrade.com

Finance options Personal Finance 12 months Interest Free Option. Typical example: Cash price £1300, 10% deposit £130, then either pay 48 monthly payments of £39.69, total amount payable £1905.12 APR 29.8% (Interest is calculated from the day you sign the credit agreement) OR alternatively, pay 11 monthly payments of £39.69 and if you pay the balance of the cash price in full within 12 months of the date of the credit agreement then we will waive any interest, total amount payable £1300. Written quotations are available on request. Credit is subject to status and available only to persons aged 18 years or over. **Business Finance** Typical example: Total cash price £2000+VAT. Deposit £204.80+VAT followed by 11 quarterly payments of £204.80+VAT. **Warranty options** Three year world collect and deliver warranty - 1 year extended warranty in addition to the standard 2 year warranty including accidental damage for UK residents £75+VAT. **Terms & conditions** Prices valid from 20.05.02. **Delivery charge** for all orders within the UK is £29+VAT. **Hard drive:** Gb means 1,000,000,000 bytes; total accessible capacity varies depending on operating environment. **Modems:** Maximum data transfer rate is dependant on certain factors including telephone lines, communication software and communication protocol. **LCD screens:** Warranty covers 5 dead pixels or more than 2 pairs of adjacent pixels. Hi-Grade and UltiNote are registered trademarks of Hi-Grade Computers plc. Intel, Intel Inside, the Intel Inside Logo, Celeron and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, Windows and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Prices and specification may be changed without notice.



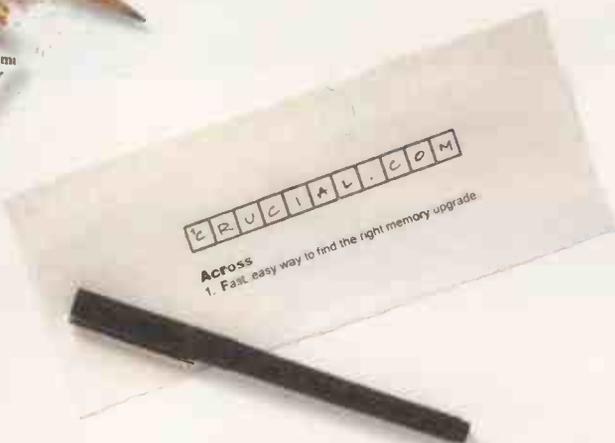
BizRate.com



Upgrading your memory doesn't have to be complicated.

A-5 March 15, 2001

GET MORE MEMORY? HOW?



You need Crucial RAM.

Select your system make and model at Crucial.com/uk, and you'll find memory guaranteed to be compatible with your system or your money back. It's that easy! Best of all, you'll get the same top quality memory the world's leading computer makers install in their systems. Visit Crucial.com/uk and get great memory upgrades at low, manufacturer direct prices.

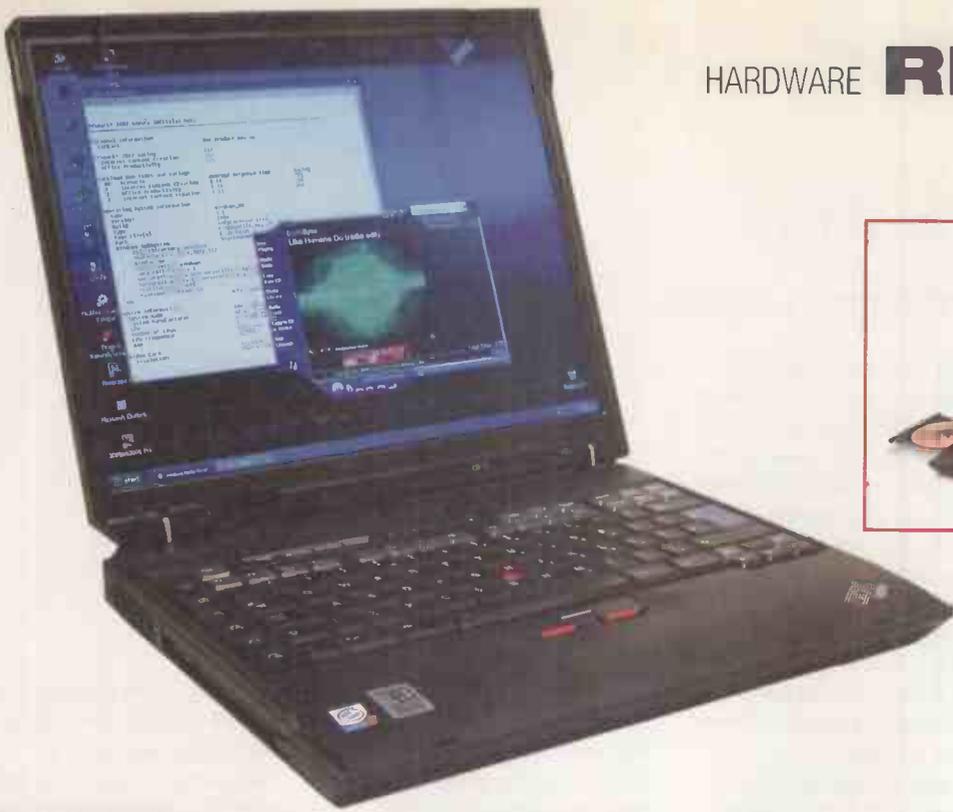
£29⁶⁹ EXC VAT **128MB PC133 SDRAM** for today's most popular systems

Prices reflect an automatic 10% discount for ordering online. Prices may vary according to specific system requirements. The prices listed were valid on 25/4/02 when we sent this ad to the publisher; however, prices may have dramatically increased or decreased since then. Visit the FAQ section of Crucial.com/uk to learn more about why memory prices go up and down.

© 2002 Micron Technology, Inc. All rights reserved. The Memory Experts is a service mark and Crucial Technology, the Crucial logo and Micron are registered trademarks of Micron Technology, Inc. in the United States and other foreign countries. All other brands and names used herein are the property of their respective owners. Crucial Technology Europe is a division of Micron Europe Ltd. Crucial Technology Europe is not responsible for omissions or errors in typography or photography.

Order online:
www.crucial.com/uk
or Freephone: 0800 013 7395

crucial
TECHNOLOGY
A Division of Micron
The Memory Experts™



There are two 5.25in bays; one on either side, allowing you to have both the CD-RW/DVD combo drive and a numerical keypad extension installed

IBM Mobile Pentium 4 notebook

Beneath its chunky exterior the Thinkpad A31 hides some neat features

One of IBM's first ventures into the Mobile Pentium 4 market is a chunky number, weighing in at over 3kg. Its remarkably sturdy exterior, makes it ideal for the road warrior who fancies a spot of weight training while on the move.

Packed with a 1.6GHz Mobile Pentium 4 and 256MB of PC2100 DDR SD-Ram, performance is more than we could ask for from a notebook, or even need. Running under Windows XP Professional, the overall Sysmark score of 147 is one of the highest we have seen from a notebook. But performance is not the be all and end all and, at just under £2,500, this notebook has a lot more to prove.

Scouring the exterior, the first thing you notice is the plethora of ports and features. The most impressive inclusion is that of a spare 5.25in bay. With one on either side of the chassis, you could have both the included eight-speed CD-RW/DVD combo drive and a numerical keypad extension installed at the same time; quite a rarity, even for a notebook of this size. Sound is surprisingly well catered for; the Soundmax chip is better quality than we had expected, as are the stereo speakers, and the three audio-in/out ports are clearly labelled to the side. Two Type II PC Card slots sit alongside the left-hand 5.25in bay, and at the rear of the Thinkpad are the usual array of I/O ports: two USBs, one serial port, one parallel, a PS/2, Ethernet and modem.

But if we were shelling out £2,500, a few more options, such as Firewire and a couple more USB ports, even USB2, would have been appreciated.

The 15in LCD screen is superb, filling the whole side of the chassis, and has a native resolution of 1,400 x 1,050. However, other resolutions do look pretty horrendous. The anti-glare covering on the screen is what really sets it apart from the crowd – everything is very clear and crisp. Graphics from an ATI Radeon Mobility 7500 chip are surprisingly good. A 3Dmark score of 2,558 is more than enough to let you run Quake III, and indeed most of the games on the market today. The Thinkpad A31 also comes with a 40GB hard drive. While this may seem huge, almost excessive, considering what you can actually do with this behemoth, the extra storage space could easily come in handy.

The keyboard is, on the whole, excellent. Buttons are large and feel good to the touch, but we did have a few problems on our review model. First of all, the Internet and email shortcut keys are arranged down the left-hand side of the keyboard, rather than on top where you would normally expect them. This led to many a slip-up on our part, for instance when we mistook the Compose Email key for the Escape key.

But most disappointing of all is the lack of a Windows key. This is unforgivable these days, considering

how much most people use it, and particularly odd considering the enormity of the typically adjacent Control and Alt keys. On the plus side, the trackpoint is truly excellent, though we expect nothing less from IBM. The centre of the three mouse buttons acts as a scroll wheel and is a particularly handy function.

Battery life has often disappointed when it comes to Mobile P4 notebooks, this month's Sony being the only real exception (see p47). Sadly, the IBM gives us a measly one hour 42 minutes; a particular surprise considering the size of the battery that could have been fitted into the Thinkpad's mammoth chassis.

With all the features you could expect from a high-end notebook, and the system performance to match, there's no faulting IBM's intentions. But considering its heftiness, both physically and financially, when you hold this up against other P4 notebooks currently on the market (see the Dell p52 and Sony p47 reviews, and our notebook group test on page 107), this one pales a little.

Mark Walsh

SPECS

1.6GHz Mobile Pentium 4 processor • 256MB of PC2100 DDR SD-Ram • Intel 845 chipset • ATI Mobility Radeon 7500 graphics chip • 15in LCD screen • 1,400 x 1,050 max resolution • 40GB hard drive • 8x CD-RW/DVD combo drive • Windows XP Professional • Weight: 3.5kg

DETAILS

PRICE £2,469.85 (£2,102 ex VAT)
CONTACT IBM 0800 169 1458

www.pc.ibm.com/uk

PROS Featured packed

CONS Heavy; expensive

OVERALL There's no denying this is high-quality notebook with great performance and an even better screen. But at nearly £2,500, regardless of its extra features, it just doesn't measure up against the competition

SCORE █

PERFORMANCE

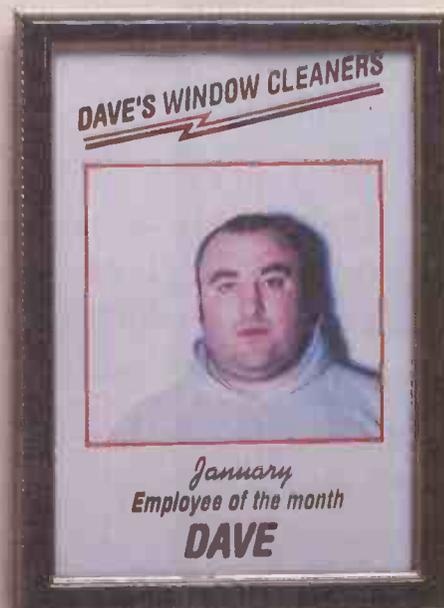
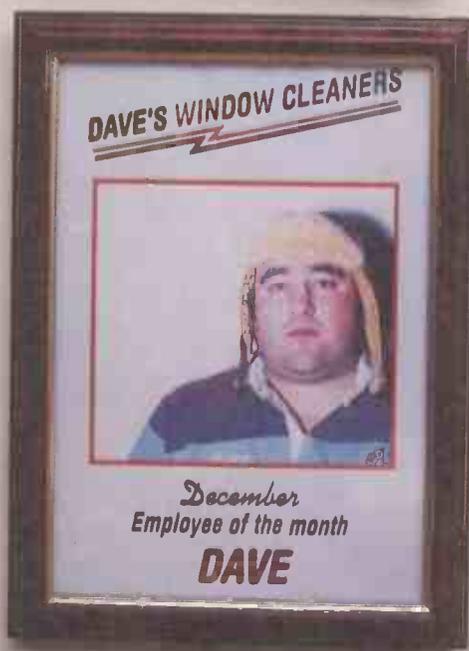
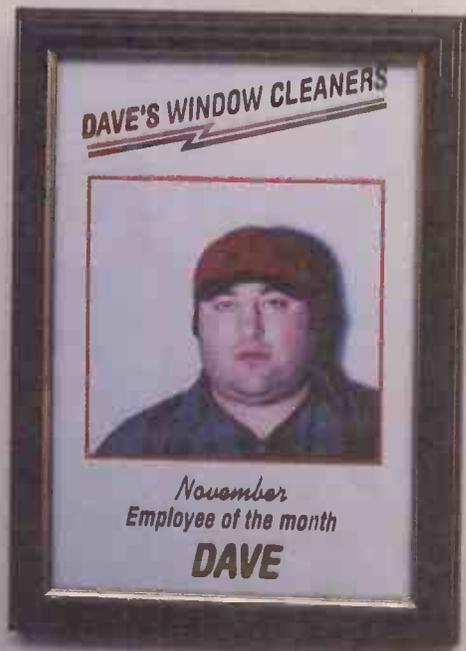
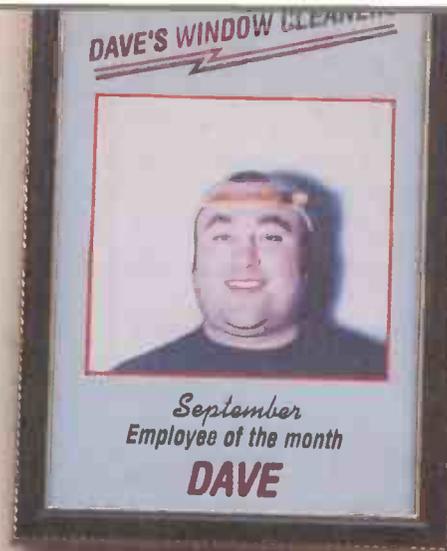
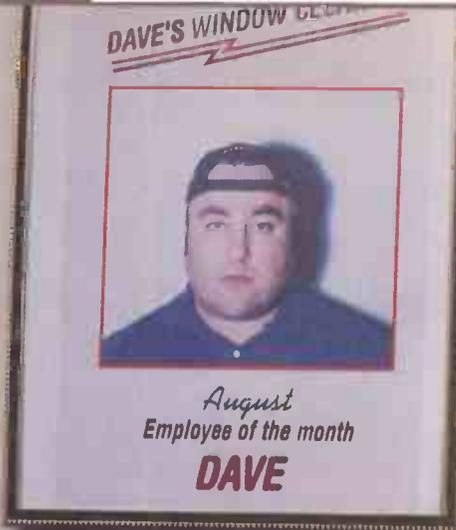
Sysmark 2002 147

3Dmark 2001* 2,558

Battery life (hours & mins) 1:42

* Tested at 1,280 x 1,024 32bit colour

PCW



Now any business can afford the highest quality colour laser printer.



Come on, it's time to start showing off a bit with the real benefits of colour. From documents to certificates the EPSON AcuLaser C1000 now puts professional quality colour printing within easy reach of any business.

What's so special? First it's got an effective resolution of 2400dpi to ensure the highest quality output on plain paper. This, combined with a massive

650 sheet capacity, delivers up to 20 pages per minute in mono, or 5 pages per minute in full colour, both with superb EPSON print quality. Then there's the price tag. At only £765 (excl VAT) it truly is affordable. And with one year's on site warranty, well, that's just us showing off.

For more details call 0800 220546 or visit www.epson.co.uk



Free EPSON Digital Camera worth £349.99 (inc VAT) with every purchase.*

* If bought before 28th June 2002. Subject to terms and conditions. Please contact EPSON for more information.

EPSON. See what you're missing.

EPSON®



Digitally yours

So fast, so good.

(Now even faster, even better.)

The **GCE-8320B Rewritable Recorder** combines exceptional data recording speeds with amazing reliability.

32-speed CD-R, 10-speed CD-RW and 40-speed CD-ROM are supported by buffer under run proof technology, 8mb buffer memory and unrivalled quality control.

As one of the world's foremost IT companies, we offer service throughout the UK and Ireland.

And if you give us a call, we'll give you the name of your nearest stockist.

Committed to your needs.



4.7GB
DVD-RAM Drive
(DAD-8020B)



16x DVD-ROM Drive
(DRD-8160B)



32x CD-Rewritable Drive
(GCE-8320B)



52X CD-ROM Drive
(CRD-8520B)



Combo Drive
(GCC-4120B)



Slim Combo Drive
(GCC-4080N)



T: 0870 6075544

www.lge.co.uk

LG Electronics UK Ltd.

LG House, 264 Bath Road, Slough, Berkshire, SL1 4DT

World Leader

in Optical Storage

Creative Nomad Jukebox 3

A 20GB hard drive provides loads of room for MP3s



Despite a 30 per cent reduction in size since its last incarnation, Creative's Jukebox is still by far the chunkiest MP3 player on the market, coming in at roughly the size of 10 CDs piled on top of each other. However, portability seems to be more coincidence than design, as many of its features, particularly the inclusion of a remote control, imply that it is more of desktop accessory.

Capable of wav, MP3 and WMA playback, the Nomad now includes a Firewire port for faster data transfer. The analogue and optical line input to the side allows for wav recording and direct MP3 encoding. Rates of between 64 and 320Kbits/sec can be selected.

Its hard drive clocks in at 20GB; this will easily store the average music lover's complete CD collection. Transferring 300MB of MP3 files via the USB cable took just under six and a half minutes, and around a third of that using the Firewire port. Battery life is impressive to say the least, offering in

the region of the stated 11 hours of playback. There's also an option to install a second lithium-ion battery, though this comes at an extra cost.

The LCD screen may be large, but from time to time the interface was confusing. Our real complaint, though, was with Creative's supplied software. Once installed, splash screens and toolbars littered our desktop.

The quality of playback is very impressive, but the included EAX functions add various atmospheres that are ineffective and therefore pointless. The supplied headphones

are reasonably comfortable, but sound quality through them is quite poor. The remote is small, with few controls to get to grips with. But this, just like the device itself, serves its purpose.

Mark Walsh

DETAILS

PRICE £349.99 (£297.36 ex VAT)

CONTACT Creative 0800 973 069
<http://europe.creative.com>

PROS Fast data transfer; huge capacity

CONS Occasionally annoying interface

OVERALL Part MP3 storage device, part portable player, this doesn't quite suit either function perfectly. Nevertheless, it is fast and feature packed and has the largest hard drive in the field

SCORE ■■■■

SPECS

20GB of storage space • USB and Firewire connections • Headphone output • Two line outs • Optical input • Weight: 293.8g without batteries • Dimensions: 123 x 130 x 35mm • Battery life: 11 hours per Li-ion battery • Creative Playcentre, Creative file Manager and Audiosync software

Logitech THX speakers

The cinema experience comes to your desktop

The Z-560s are the first speakers to emerge from Logitech since its acquisition of Labtec, and are the first multimedia speakers to be officially THX certified. THX is essentially a list of manufacturing standards – more information on this Lucasfilm-owned branding can be found at www.thx.com.

Good-looking and sturdy, this five-piece connects to your PC via mini-jack cables and bare wire from subwoofer to satellites. The intention behind this is to reduce interference that can often come from poorly constructed connectors. The slightly less pretty remote has a headphone socket, along with power, fade (front-to-back output ratio), bass, overall volume and M3D controls. M3D aims to create surround sound from a stereo source; the effect is reasonable, but there's slightly too much reverb for our liking.

Positional information is accurate and sounds are crisp and clean. The lack of a fifth satellite seems bizarre at

first. As all audio is fed solely via two mini-jack cables, there isn't a distinct subwoofer feed and we found that speech could occasionally be crowded out by sound effects. The very chunky subwoofer inevitably produces brutally loud bass levels. These are clearly speakers designed for film, as even on its lowest setting the bass is too high for decent music playback.

All in all, this is a very good set of speakers, managing to produce a

cinematic feel even in the less-than-ideal conditions of our labs. But £200 could get you a better rounded set of home entertainment speakers.

Mark Walsh



DETAILS

PRICE £199.99 (£170.20 ex VAT)

CONTACT Logitech
www.logitech.co.uk

PROS Excellent film playback

CONS Overly heavy bass; expensive

OVERALL Sitting in the middle of both price and quality scales, these are an excellent purchase if you watch DVDs on your PC. However, music lovers should steer clear

SCORE ■■■■

SPECS

400w RMS total: 188w subwoofer • 53w per satellite • 35Hz-20KHz frequency response • >100dB Signal to Noise Ratio • Mini-jack connectors to PC; bare wire between woofer and satellites



The advanced 950 driver keeps you informed of job progress, ink supply and more



Epson inkjet printer

The Stylus Photo 950 delivers decent picture quality but at a hefty price

Epson debuted Print Image Matching (Pim) in 2001. In partnership with 13 digital camera manufacturers, it had developed a new way to record camera settings and feed them to an inkjet printer. The printer consulted this adjustment data to produce more realistic looking prints.

However, while Pim knew all about colour balance and sharpness, Exif, an already established standard, did some other things that Pim did not, such as recording exposure times and white balance settings.

Since 2001, though, a lot has happened, with Exif2.2 arriving on the scene, and a fresh release of Pim, PimII, appearing in Epson printers. PimII now incorporates Exif2.2, closely aligning Epson to the more established standard. One of the payoffs, in theory, is Image noise reduction, which should be of particular interest to those camera manufacturers looking to squeeze high resolutions out of small sensor chips, resulting in cheaper and smaller hardware. There are no PimII cameras yet, but there is one compliant printer – the Stylus Photo 950. It is a hefty beast with a price to match: £322 ex VAT. But before that price sees you turning the page, check out what it can do.

Epson uses Piezo technology where a vibrating crystal ejects ink from the head. This, combined with tension on the surface of the liquid, allows it to vary the size of each drop. However, variable size droplets

have been cast aside in the 950 in favour of a faster engine. The crystal's vibration cycle has been halved, allowing it to produce a physically smaller droplet of just 2pl (picolitres) and a top resolution of 2,880 x 1,440dpi (dots per inch). Being twice as fast, you can print at double the resolution without slowing down.

It certainly flew through our four key tests, too, and beat every printer in our November issue printer group test by a comfortable margin. Our 50-page plain-text file completed its run in just eight minutes 16 seconds. The 50-page pdf was ready for collection after just eight minutes four seconds, and it only took an impressive seven minutes 54 seconds to process a 50-page mixture of text and screenshots. These results are most likely the fruit of extra nozzles in the head and a second black ink well.

Speed isn't everything, though, so we were relieved to see that the 950 lives up to Epson's boast of quality. Even on photocopy paper, large black characters were dense, and feathering – a risk when using cheaper paper – was barely discernible. Text was easily legible in all point sizes down to 2pt.

Switching to photo paper for our standard test photo, we saw speed results in line with those from the group test: two minutes 11 seconds compared to the group test fastest of two minutes 28 seconds. Quality was excellent. Similar colours could be distinguished one from another, and

areas of tonal variation showed smooth gradations. Traditionally tricky skin tones were realistic. However, the 950 really impressed when printing landscapes and nature, with complex forestry, subtle hillside fog and vivid sunny skies well reproduced.

For the photo enthusiast, it takes Epson paper rolls, as did the 895 (November 2001, p216), and has the added bonus of an integrated cutter and hammock-like device for catching the completed prints.

Beneath the hood is a dial that raises the workings slightly to accept a CD caddy. Several manufacturers are now producing printer-compatible blank CD media and Epson has thrown in design software to simplify the process. While the results were nowhere near as vivid as either its photo output or shop-bought CDs it was certainly easier – and tidier – than using CD labels.

With individually replaceable ink wells, you should save money on refills, but whether this is reason enough for the initial investment is up to you.

Nik Rawlinson

DETAILS

PRICE £378.99 (£322.55 ex VAT)

CONTACT Epson 0800 220 546

www.epson.co.uk

PROS Versatile; very fast; integrated paper cutter

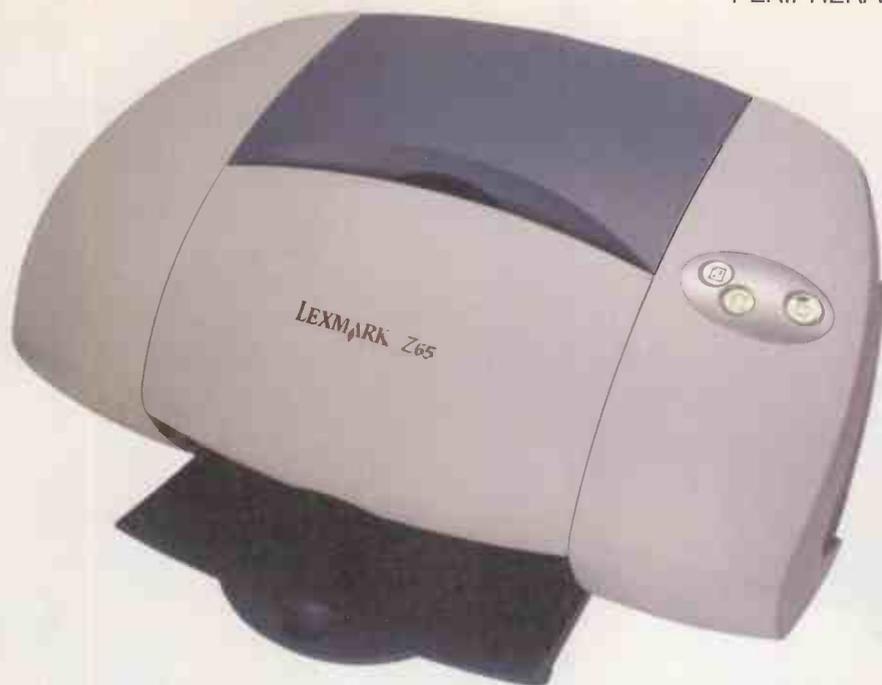
CONS Pricey

OVERALL With first-class drivers, impressive output and a lightning-fast print engine this printer sits at the top of the semi-professional stack. It would be a five-star product were it not for the price, but a bit of shopping around online should find you a better deal

SCORE

SPECS

Piezo inkjet technology • Max resolution: 2,880 x 1,440dpi • USB and parallel interfaces • Five colour, two black cartridges • Cartridge life: 440 pages from colour cartridges with five per cent coverage, 628 from black • Operating system support: Windows 95, 98, ME, NT4, 2000, XP • Weight: 7.4kg • Dimensions: 515 x 663 x 299mm (w x d x h)



The high-resolution Z65 has two paper trays, one of which uses an automatic paper sensor

Lexmark high-resolution inkjet printer

Its simplicity of use and automatic cartridge alignment make the Z65 attractive

Lexmark's Z65 A4 inkjet printer has the highest resolution currently on the market, coming in at 4,800 x 1,200dpi (dots per inch), and proclaims a print speed of up to 21ppm (pages per minute).

Apart from its speed and resolution, Lexmark is particularly proud of the printer's automatic cartridge alignment feature. This eliminates the need for manual alignment, helping to increase ease of use and minimise user intervention. Once you've placed the tri-colour and black cartridges into their respective slots by lifting the front cover, the LED and optical sensors read the alignment page, then automatically adjust the printhead and printer driver settings. The space between the colour and black cartridges can vary slightly, so this technology can help reduce misalignment of the print cartridges and ensure the best print quality. It's also a real boon not having to print a special alignment page and manually change the software driver settings.

The Z65 automatically recognises different paper types and adjusts the printer settings to achieve optimal print quality. Print drivers adjust the way they format print jobs depending on the type of media used, so failing to select the correct print option in the driver software can lead to poor results or no visible gain in quality.

Automatic paper type sensing eliminates this potential for human error. A paper type sensor in the printer's

paper tray constantly monitors the type of paper loaded. Working with the basic physical principle that different types of paper reflect light in different ways, the paper sensor is made of a light emitter and two light captors. Depending on which captor receives light, and in which quantity, the printer's driver determines which type of media is loaded from a choice of plain, photo or coated paper, and transparency, and makes any configuration changes accordingly.

The Z65 has dual paper trays. The nearest of the two trays at the front of the printer has a plain paper capacity of 100 A4 sheets, and the rear one can hold 150 A4 sheets. Both trays use Lexmark's Accu-Feed paper handling system, but only tray one uses the automatic paper sensor. Either tray can be selected by pressing the corresponding button on the printer or via the printer driver software.

Although Lexmark has made several printhead design improvements on its colour and black cartridges, the quality of the Z65's photographic output isn't on a par with offerings from Epson or HP. At times acceptable, occasionally horrendous, close scrutiny reveals pixels that are not noticeable on continuous tone prints, slight over-saturation of colours that frequently requires manual software correction, and images that generally appear 'flat'.

Print speed is also disappointing, being nowhere near Lexmark's claims of up to 21ppm (mono; five per cent

saturation) and 15ppm (colour; five per cent saturation). We achieved 7ppm and 2ppm respectively. Lexmark has been able to improve on its print speed by increasing the size of its printhead swath from a third to a half an inch (the size of printhead, plus the area covered in one pass of the cartridge). It has also introduced a redundant nozzle design. Two nozzles are responsible for each line of print, allowing them to fire alternately, resulting in a faster carrier. Also, if one of the nozzles fails, the other can continue printing, lapping over the areas missed by the faulty nozzle.

Back on the down side, Lexmark, like most other printer makers, doesn't supply a USB cable – an irritating omission. It's a shame the three-colour cartridge design is so expensive to maintain at over £20 a cartridge, and that the print quality is only mediocre, because the Z65 is quick and easy to use. While the Z65 may be one of the simplest printers to use, many may find the quality and speed of its output too offputting.

Rob Christian

SPECS

Max resolution 4,800 x 1,200dpi • USB 1.1 • Tri-colour, single black cartridge types • Cartridge life: 450 colour pages at 15 per cent coverage; 600 black pages at five per cent coverage • Maximum paper weight 270gsm • Operating system support: Windows 98, ME, 2000, XP, Mac OS 8.6-9.1, Mac OS X • Weight 4.9kg • Dimensions: 445 x 305 x 216mm (w x d x h; paper support and exit tray retracted)

DETAILS

PRICE £129.95 (£109.95 ex VAT)

CONTACT Lexmark

08704 440 044

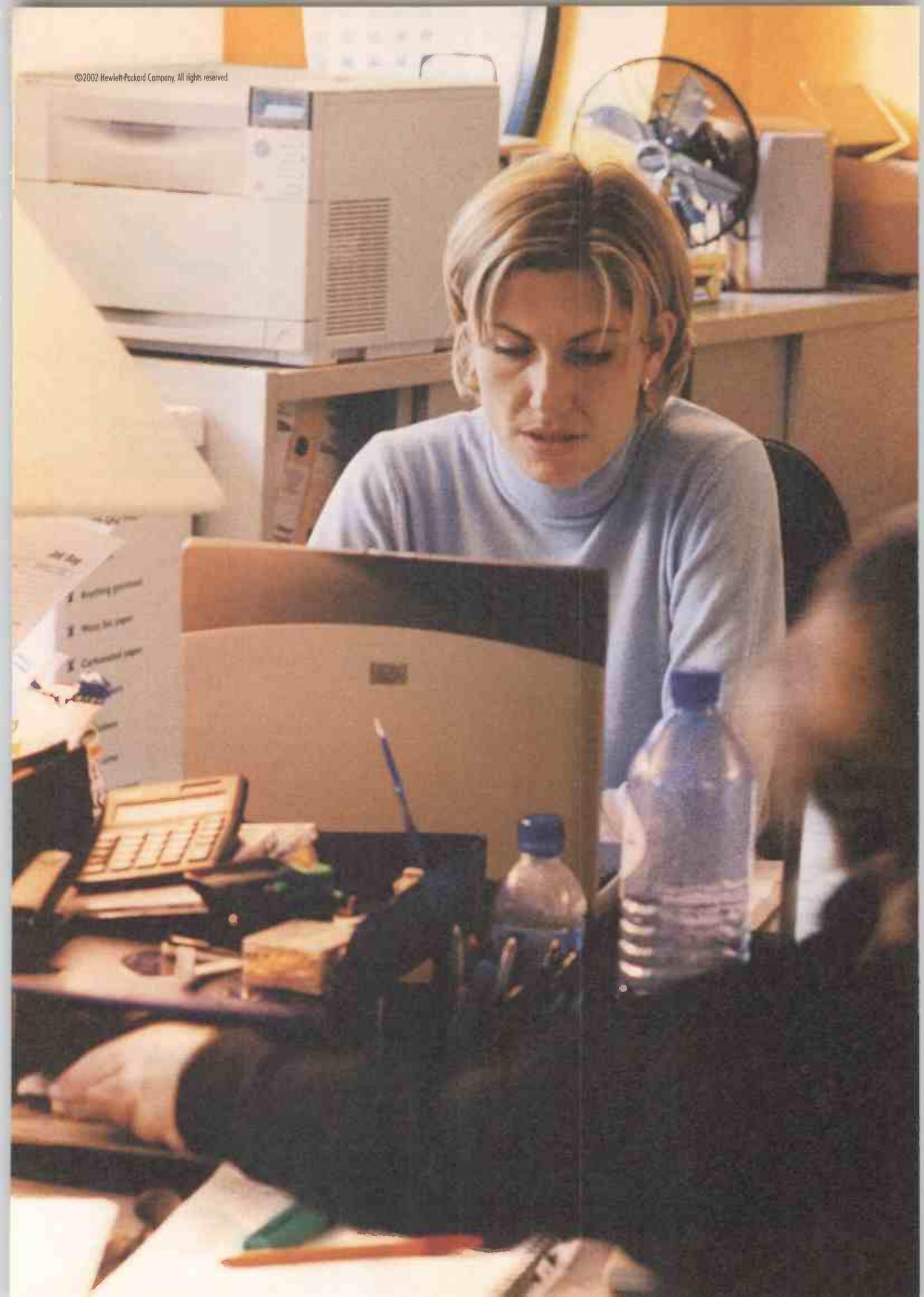
www.lexmark.co.uk

PROS Fast; intuitive to use; reasonable price

CONS Expensive to run; poor photographic print quality

OVERALL A new graphical user interface, automatic cartridge alignment and paper type sensing make using this inkjet printer a breeze, but print quality is mediocre and its three-colour cartridge is expensive for large print runs

SCORE 





Does the brilliance on the outside of your presentation reflect the brilliance on the inside?

Does it demonstrate the months of effort you've put into the thinking? Does it make your point? Does it make it clear? Does it make it compelling? No matter what size your company is, you can continually present yourself in a confident, professional light with spectacular output from HP colour printers.



HP invents powerful, flexible solutions that can help any business make a big impression. Solutions that always start with you – your issues, your people, your opportunities. Give your brilliance a chance to be brilliant. Find out more about the entire line of HP colour printers at www.hp.com/uk/smbprinters

Brother multifunction device

A convenient and versatile all-in-one unit



By combining an inkjet printer, scanner, colour copier and plain-paper fax machine into one unit, Brother's MFC-590 saves you desk space. It's also a versatile alternative to peripherals, letting you operate fax and copier functions directly without switching on your PC.

Up to 100 sheets of paper are loaded into a lean-back feeder, with printouts emerging onto an extending output tray at the front. There is an automatic document feeder on top of the machine which operates for multipage faxes and copies alike. This lifts up to reveal a conventional A4 glass scanning plate for thicker originals such as books, magazines and bulky objects.

The printer hardware is built around a 1,200dpi (dots per inch) Piezo printhead, using four ink cartridges. Having separate cartridges, as opposed to one black and one tri-colour, is less wasteful over time, but replacing all the inks at once is expensive at over £40. Print quality is average but by

no means poor, while real-world throughput is slow at around 2-3ppm (pages per minute) for ordinary colour office documents at normal quality. It is capable of near-photo quality, but with our A4 photo test on glossy paper taking more than 19 minutes, we can't imagine anyone wanting to bother.

The scanner uses a 36bit CCD array capable of capturing images at up to 600 x 2,400dpi optical sampling rate. Scan quality is not sophisticated, but is acceptable for general office scanning, colour copying and faxing. Fax performance is equally competent, enhanced by a clear button layout.

Our biggest concern was the incomplete support for Windows XP. Drivers are available from <http://solutions.brother.com>, but were absent from our test sample. Most buyers though will be perfectly happy with the average quality and performance.

Alistair Dabbs

DETAILS

PRICE £445.32 (£379 ex VAT)

CONTACT Brother UK
0161 931 2354

www.brother.co.uk

PROS Convenient and straightforward to use

CONS Slow and noisy, doesn't fully support Windows XP

OVERALL In classic multifunction style, this machine is a jack of all trades but a master of none. Speed and quality for each function is never better than average

SCORE ■■■■

SPECS

Print speed: 10ppm mono, 8ppm colour
• Parallel and USB interfaces • Inkjet cartridge • Cartridge life: black 950 pages, cyan/magenta/yellow 450 pages • Weight: 11kg • Dimensions: 468 x 467 x 368mm

Panasonic 3-in-1 gadget

Audio and video playback – and a digital camera to boot

Panasonic's SV-AV10 is a digital camera, audio player, voice recorder and mpeg-4 camcorder squeezed into a tiny box.

The maximum resolution for pictures is 640 x 480. Despite the flash, which has to be manually enabled, you'll get the best results in daylight and, sadly, there is no zoom function. Framing the picture is easy – the image appears on the 2in LCD screen, which neatly folds out (see picture).

Mpeg-4 movies are small in size and jerky, but adequate if you just want short, emailable clips. Our 20-second movie took up 620KB of space on the supplied 8MB SD (Secure Digital) card, so the most you'll be able to store is six minutes. There is a small microphone at the front, along with the camera lens.

As a voice recorder, it's hard to fault, but then it's quite difficult to get this feature wrong. You can fit up to 25 minutes of speech onto the card.

Transferring files from SD card to a PC is straightforward with the included

USB reader/writer, which appears as a drive in Windows Explorer.

The SV-AV10 scores well on digital audio. Real Jukebox lets you rip music from CD onto the PC hard drive and transfer it onto the SD card. We found it tricky to use. The device can play back MP3 or AAC files – Panasonic recommends the latter as they take up less space.

Storage space is the main problem with this product – the 8MB card just isn't large enough to store audio. We

could only fit six AAC tracks on the card, and that was at the very low-quality rate of 32Kbits/sec. To use this feature properly, you'll need to invest in a 64MB card, costing around £65.

John Collins



DETAILS

PRICE £260 (£221.28 ex VAT)

CONTACT 08705 357 357

www.panasonic.co.uk

PROS Compact; lots of features; a fun gadget

CONS Small amount of storage supplied

OVERALL It's best to think of this as a decent digital audio player with some handy extras. Make sure you get your hands on a larger memory card though

SCORE ■■■■

SPECS

640 x 480 resolution images • 2in LCD • MP3, mpeg-4 and AAC support • 8MB SD card • USB SD card reader/writer supplied • Real Jukebox and SD movie stage (mpeg-4 video editing) software • Weight: 98g

Britain's computer technology experts for over 30 years!

Technomatic®

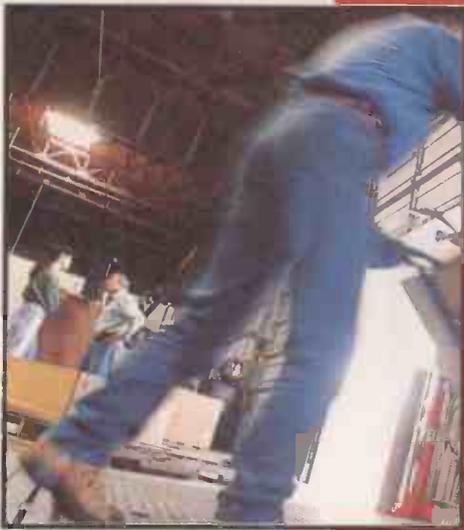
Hardware, software and networking all in **one call.**

Fast and accurate shipments for **Next Day delivery.**

Experienced **Trouble-free Tech Support** experts.

Access to the very **Latest Lab Test Products.**

The convenience of 6-month **0% Financing.**



Our warehouse ships around 3,000 parcels per day via insured next day delivery. You can track orders on the Parcel Line web site right up until you sign for them.



We have engineers trained by every leading manufacturer available to support your purchases **FREE** for life! Give us a call and let us help.



Our web site is totally secure, includes over 15,000 products, and you can get **FREE** delivery on orders over £100 placed on-line.



In our purpose-built Technical facility, we can install memory or software at very low costs and fully test your computer before we send it to you! Call us for more details.

Free!

Call now to receive our catalogue jam-packed with the latest computer hardware, software and networking products for home and office.



HP XE310



- Celeron 1GHz
- 128MB RAM
- 20GB HDD
- CD-ROM
- LAN Card
- Windows XP Home

*Monitor not included

Only **£375**

£440.63 inc. vat

Ask for item# E399208

15" TFT LCD Belnea 101535

- 15" TFT LCD Monitor
- 1024 x 768 Display Resolution
- 16.7 Million Visible Colours
- VESA FPM/PMI Standard Compliant
- 3 Year on-site Swap Out Warranty



Belnea

From Only

£249.99

£293.74 inc. vat

Ask for item# E363931

Palm™ m515

- Vivid colour on a sidelit screen, twice as bright as the Palm™ m505 handheld
- 16MB of RAM - twice as much as other Palm™ handhelds
- SD Card expansion slot for storing additional applications and files



Only **£274.99**

£323.11 inc. vat



Ask for item# E408243

The Smarter Work Experience

NEW! Microsoft Windows XP

Windows® XP Home Edition delivers a new level of reliability to help your computer stay up and running. From compatibility improvements to make more hardware and software work with the operating system, to improved help and support services, Windows XP Home Edition lets you spend more time working and playing on your computer—and less time fixing problems.

Ask for item# E356830

Microsoft



All New Office Xperience

NEW! Microsoft Office XP

Microsoft Office XP puts the features users need within easy reach at all times. Working alone, users will experience increased productivity, while working with others, Office XP enables them to collaborate more effectively. Plus, Office XP utilises the full-power of the Internet with Web features designed to enhance their work. And, increased reliability means that users can work with increased confidence in their software, so they can focus on the work at hand.

Prices starting at **£149.99**

£176.24 inc. vat

Ask for item# E322736

Microsoft



IBM R30 Series Notebook

- Celeron 900MHz
- 128MB RAM
- 15GB Hard drive
- 14.1" TFT display
- CD-ROM drive
- 56k modem & 10/100
- Windows 98 or 2000



W98 E386315 **£649** (£762.58)

W2K E386321 **£699** (£821.33)

VAT inclusive pricing is shown at 17.5%. All products sold are subject to our standard Terms & Conditions, which are available on request. E&OE. Pricing excludes delivery.

A MicroWarehouse Company

Technomatic®

Providing Britain's top computer products for home and business.

Phone: **08705 275 262**

Sales and Information Lines open Mon - Fri: 8am - 6pm, Sat: 9am - 1pm

Quote Priority Code PCW

Order securely online at: www.technomatic.co.uk

Britain's computer technology experts for over 30 years!





A USB cradle allows the F601 to transfer files to your PC – and it recharges the batteries too



Fujifilm slimline digital camera

The Finepix F601 Zoom has a unique vertical aspect

Fujifilm's F601 digital camera is compact, sleek and weighs 220g. Its aluminium-magnesium alloy body looks stunning, and the camera is petite enough to slip in your pocket. However, its size prevents full use of the features it offers, and the vertical-aspect also makes it hard to manage.

The F601 looks more modern than the previous model, the 6900, which had a more professional look. It boasts a high resolution of 2,832 x 2,128 with a 3x optical zoom and a 4.4x digital zoom. The lens is rated as being equivalent to 38-108mm on a standard 35mm camera.

Fujifilm uses its own Super CCD technology. This processes the data from the 3.1 megapixel Super CCD chip in the F601 Zoom to deliver a 6 megapixel file. However, as a 6 megapixel file is more than twice the size of the original, Fujifilm is forced to apply a higher level of compression in order to fit the same number of images onto the memory card. Image quality is therefore no better than that of a typical 3.1 megapixel camera.

Full manual control is available, as you would expect given the cost. However, the Menu button is a real nuisance, as it is also used to operate the zoom. Fumbling between the two is tricky and, despite crowding the dashboard, these would have worked better as separate functions.

The photography mode has a

separate dial, but it's a bit fiddly.

The different modes on the rotary dial include auto photography, scene position, manual shots, movie and audio recording. When selected, these light up with a matching icon above the TFT – useful for night-time shooting. There are seven white balance settings, and the macro focus range is from 20cm. The focus options also allow switching between manual, auto and AF (area focus).

Exposure options come in four flavours: programmed auto exposure (AE), aperture-priority AE, shutter-priority AE and manual exposure, with aperture ranging from f2.8 to a decent f8 at full zoom. For increased sensitivity, the camera features ISO settings up to 1,600, surpassing the specs of its predecessors. The higher settings of 800/1,600 can only be taken at 1,280 x 960 pixels, but are good for sports enthusiasts after an action shot. Alternatively, the pop-up flash has five modes and is effective up to 15feet.

The 1.5in LCD screen provides clear, crisp vision. Scene position has five options – portrait, landscape, sports, night scene and 40-frame continuous shooting. The latter can be set for 5fps (frames per second) for up to four frames, with a maximum of 1.8fps for up to 40 frames, although the latter can only be achieved at 1,280 x 960 pixels.

Movie mode allows video footage in jpeg format with sound. With two different quality settings, the VGA offers

recording at 640 x 480 pixels at 15fps. twice the resolution of other cameras at this frame rate. You can also record at 320 x 240 pixels, allowing you to fit more onto the 16MB Smart Media card.

Audio recording via the microphone allows you to store 34 minutes onto the 16MB card, which is not really impressive. Also watch out for fingers accidentally blocking the poorly placed mic while recording. A voice memo option allows up to 30 seconds for each image.

The F601 works with a lithium-ion battery charged via the AC adaptor or through the picture cradle. Connecting to the PC via USB, the camera rests in the matching cradle and can send pictures to a PC. Bundled software includes Finepix Viewer, Video Impression and Adobe Photo Deluxe HE 4.0 for Windows.

The F601 has impressive specs for a slimline pocket number. But in aiming for such a design, ease of use has unfortunately been sacrificed.

Jananie Nadarajah

DETAILS

PRICE £599.99 (£510.63 ex VAT)

CONTACT Fujifilm 020 7586 1477

www.fujifilm.co.uk

PROS Impressive image quality in a compact package

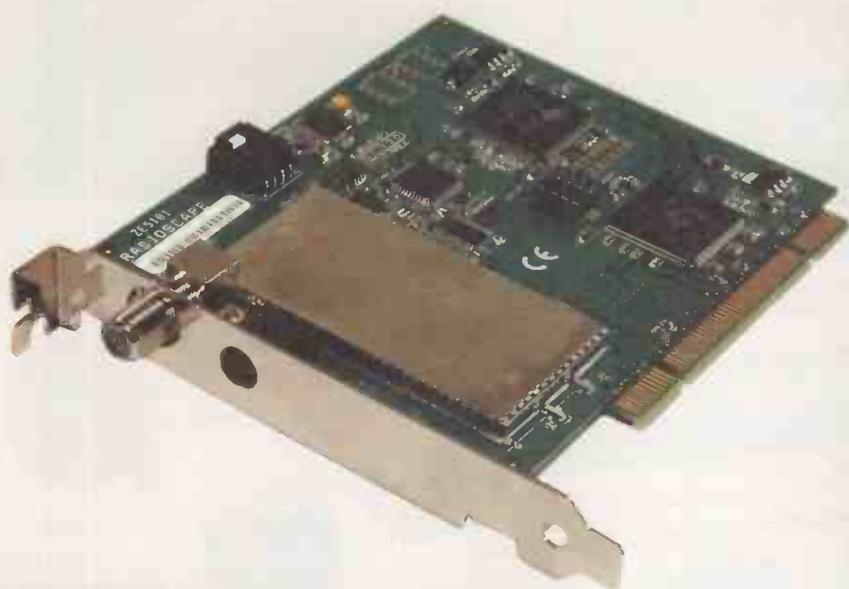
CONS Audio recording not amazingly crisp

OVERALL The F601 combines functionality with style. Zooming options have room for improvement but good configuration options permit good-quality images. Before forking out the £600, it may be worth thinking about whether such a miniature camera with its vertical aspect is too small and fiddly to really get to grips with

SCORE ■■■■

SPECS

Megapixel rating: 3.1 Super CCD • Max resolution: 2,832 x 2,128 • 3x max optical zoom • 4.4x max digital zoom • 36-108mm focal length (35mm equiv) • f2.8/4/5.6/8 aperture • 60cm/2ft to infinity focus range • 20-80cm/0.7ft-2.6ft macro focus range • Five flash modes • 1.5in LCD colour screen • ISO ratings up to 1,600 • 16MB Smart Media card • Dimensions 72 x 93 x 34mm • Weight: 220g



DAB digital radio PCI card

Modular Technology's card offers crystal-clear sound and data services too

If the Government is to be believed, the future of radio is digital and your existing tuner will soon be about as much use as feathers on a space shuttle. So, while we wonder how much it's going to cost us to replace our existing kit, advocates are citing a number of benefits to Digital Audio Broadcasting (DAB), including crystal-clear sound with no fade or hiss, a greater choice of stations and, perhaps most importantly, data services.

It's not quite that simple, though. While stations may not fade, they do gobble like a turkey with the slightest interference and, although you can already receive some digital-only stations such as Core (pop) or Oneworld (speech), the technology could mean you end up with access to fewer stations than you're picking up now. As the networks slowly roll out, you can probably hear any services from neighbouring counties that are already up and running. When your local multiplex goes on line, though, you can wave them goodbye.

Stations are organised into one of seven multiplexes (or groups) on the 217.5 to 230MHz band. They are compressed using the internationally adopted Eureka-147 standard for digital radio, with sound quality requirements built into each station's licence. Stereo music services, for example, must encode to a minimum of 128Kbits/sec, matching the quality of your average MP3.

The core of this card is the same Radioscape chip that was inside the Psion Wavefinder, so it's perhaps no surprise that the software shares some common elements. That said, while the Wavefinder software scattered the available stations in a loose multiplex arrangement across a single pane, Modular's design displays each multiplex individually, so is far easier to navigate.

The data services are currently fairly rudimentary. Most stations broadcast SMS-like messages that scroll across the screen of a regular digital receiver. On the Modular Technology interface, these scroll below the station name as you hover your mouse above its icon. Doing this also brings up a signal-strength indicator and supplementary buttons for playing or recording the station's output.

Only the BBC is running a full data service so far. BBC Vision Radio delivers simple web pages, but the download through the aerial, is painfully slow, in spite of the fact that there are no images apart from simple headers. The technology has the capacity to transmit photos alongside the audio stream, but current receivers can do nothing with them so nobody bothers.

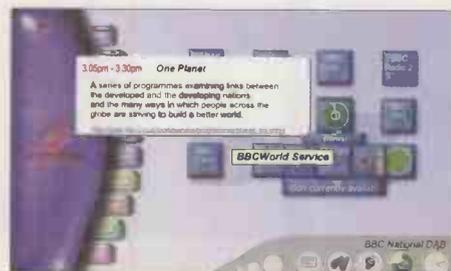
The electronic programme guide, meanwhile, facilitates timed recording. Like the data services, this is currently only being broadcast by the BBC National multiplex, but once

downloaded it brings the interface to life. Moving your pointer across a station icon calls up details of the current programme, while simultaneously producing a dedicated guide on its own page within the interface. Each entry is accompanied by relevant email and web addresses, along with a Record button which, when clicked, programs the software to record the relevant programme to your hard drive in either mpeg-2 or mpeg-3 format.

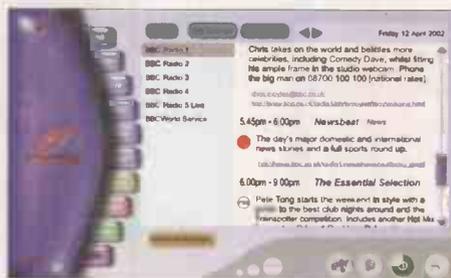
It's far easier than programming your video, and the simple interface allows you to set margins either side, automatically recording a set number of minutes of extra output on either end in case the station is running slightly off schedule.

Digital radio certainly isn't quite up to scratch yet. For a start, the infrastructure is not yet in place for truly national coverage and, while it doesn't fade or hiss, the signal is far from perfect in many covered areas – even central London.

If you live in a region where you can receive digital radio, though, and want to see what all the hype is about, this card and software combo is the best way to do it. It's cheap, the software is built with real people in mind (not amateur radio enthusiasts) and the programme guide and data services make it far more versatile than a conventional tuner.



Moving your pointer across a station icon calls up details of the current programme



It's far easier than programming your video

DETAILS

PRICE £99 (£84.26 ex VAT)

CONTACT Modular Technology
01869 321 323

www.modulartech.com

PROS Simple software; hardware more discrete than Psion Wavefinder

CONS The digital radio network is not yet national

OVERALL Far cheaper and more versatile than a conventional digital tuner, if you want to upgrade your home or office listening experience, this is the way to do it. Just make sure you have coverage first (check www.ukdigitalradio.com)

SCORE ■■■■■

Nik Rawlinson

PERSONAL COMPUTER WORLD

PC ADVICE FOR REAL LIFE



e-shopper

Interactive guide to the best products, at the best prices, from the best places.

Help and Advice

If you've got a PC problem, ask other readers for help, or even give some advice yourself!

Have Your Say

Discuss the latest IT issues with PCW readers and writers in our Reader Forum.



Personal Computer World

The latest from this and the forthcoming issue.

PERSONAL COMPUTER WORLD www.pcw.co.uk

Go to → Pick a section

NEWS centre PRODUCTS centre Search → Thursday 09 May 2002 | 1:24 PM

Articles Jobs go

EBusiness Communications Business Software Security Personal Computing Gaming

REVIEWS

STAR Toy that talks to your friends

The Finpix 6900 Zoom is Fujifilm's latest high-end digital camera for the consumer market and uses a combination of Fujinon optics and a 3.3Megapixel Super CCD. Aesthetically interesting, it offers powerful manual control and thoughtful features, but with some design oversights to buy one. Full review

PCs for your home

If you're looking for a PC with a laser printer that is suitable for office tasks, take a look at this month's group test. More on that

UPDATE

LATEST NEWS

Microsoft in ITV digital bid
Sixty unnamed firms looking to save UK cable company

Microsoft planned to buy out Nintendo
And GameCube wouldn't exist, says book's shock claim

Musical shirt unwrapped
First textile computing technology launched

Comet moves in on old handsets
Retail giant wants to recycle more than 90 million old mobiles

Notebook sales boom
SME's drive sector figures in Europe, says report

Washington workers sacked for 'Cybersmut'
State department employees arrange partner swaps online
More news

SPECIAL REPORT

Linux Special: 2002 the year of the Penguin
Thumbs up for Linux over the last 12 months. But will 2002 finally be the year of the Penguin?

COMPETITION

Win a PC worth £2000!
Have a go at our July competition and you could win a top-notch PC worth £2000. Enter competition

RETRO

The Tandy TRS-80
One of the first mass market high street PCs that shaped the 80s generation.

HISTORY

The PC celebrates over 20 years of life
It seems like an age ago, but would you believe the PC has been on our desktops for over 20 years. From the humble beginnings of the beeping and flashing Altair Mips to the super-fast home PCs of today the PC has been captivating enthusiasts and novices alike, and it's even changed our life too.

ABOUT US

- Current Issue July 2002 On Sale Now!

SEARCH PCW REVIEWS

Search PCW Reviews

DOWNLOADS

STAR Microsoft PowerToys for Windows XP

Microsoft PowerToys for Windows XP
Comprises 10 separate Windows XP extras, each one intended to enhance the Windows XP experience in one form or another. Full review

EDITOR'S LETTERBOX

Write directly to the Editor. Do state clearly if you do not wish to have your letter published.

And there's much more!

Search or browse there are hundreds of free or shareware utilities in our software library.

Next Issue
Upcoming features.

Subscribe
Join PCW today.

Contacts
The PCW team.

Special Offers
PCW Reader Offers

Home | Subscribe to PCW | Email newsletter | Contact us

UK Home Computing Magazines: Computeractive | Personal Computer World | WhatPC? | PC Magazine
UK Professional Computing Magazines: Computing | Computer Reseller News | Informatics | Network News | IT Week

Contacts | Privacy statement
Terms & conditions
© 1998-2002 VNU Business Publications Ltd. All rights reserved

www.net

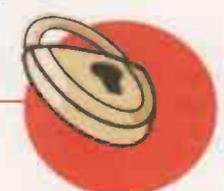


Reviews

Complete listing of all the reviews featured within PCW.

News

The most up-to-date IT news, along with Special Reports written exclusively for the web.



Downloads

Get the latest software downloads for free!

Retro

With 25 years of computing experience, PCW looks back over the IT industry.

Visit the new and updated website for all your information needs.

www.pcw.co.uk

POWERED BY
vnunet
.com



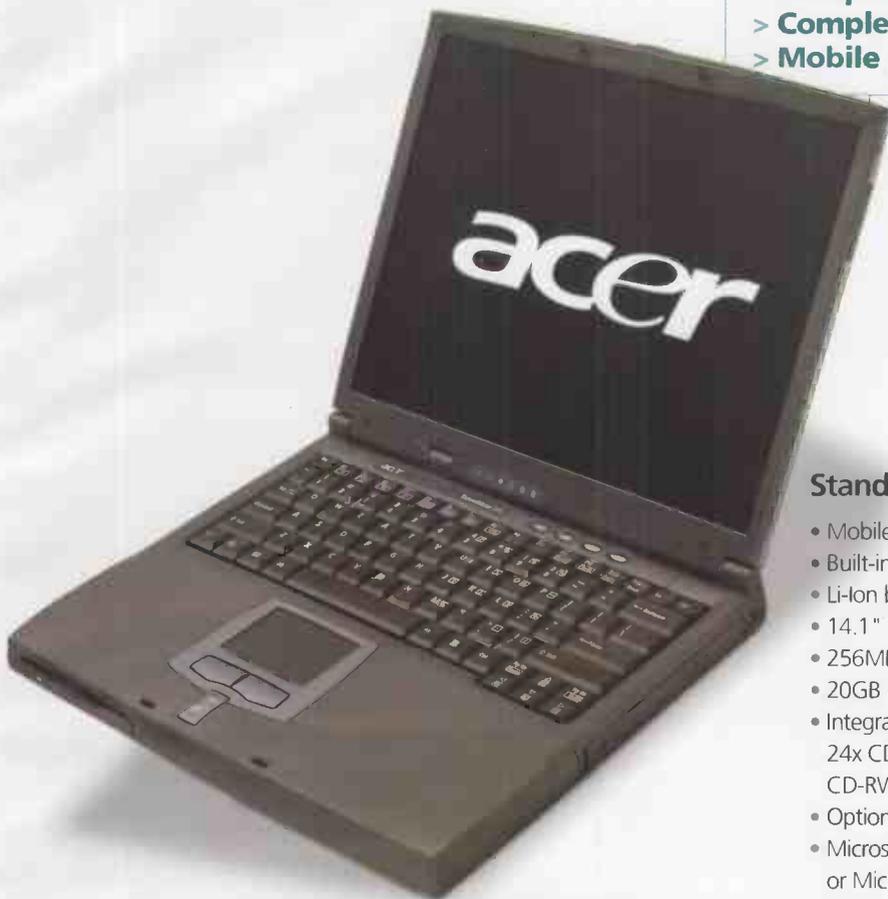
Acer Wireless T

TravelMate 260

All-in-one Peak Performance

The TravelMate 260 series is Acer's response to demands of mobile professionals looking for a computing solution that completely integrates multimedia and communication facilities with advanced performance features required by demanding on-the-move work applications.

- > Complete multimedia functionality
- > Complete connectivity
- > Mobile performance



Standard specifications include:

- Mobile Intel® Pentium® III Processor - M at 1.0GHz
- Built-in 10/100 ethernet and 56kb/s V.90 modem
- Li-Ion battery with average 4.5 hours battery life
- 14.1" TFT Display
- 256MB RAM (upgradeable to 1GB)
- 20GB Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive, 24x CD-ROM, 8x DVD-ROM or CD-RW/DVD-ROM combo drive*
- Optional DVD or CD-RW drive
- Microsoft® Windows® XP Home Edition or Microsoft® Windows® XP Professional Edition
- 2 years limited warranty



TravelMate 261XC

£1179

INC VAT

£999 EX VAT

Mobile Intel® Pentium® III - M Processor at 1.0GHz,
DVD/CD-RW combo drive,
Microsoft® Windows® XP Home.

Acer's Security Solutions

The integrated Digital Fingerprint Recognition or SmartCard with the Platinum™ software suite provides the user with unparalleled personalised security. Based on the boot protection option, it is not possible to boot up the unit without your SmartCard. Acer's security solutions also provide the user with the ability to encrypt files or directories on the hard drive. The Platinum solution also supports encrypted storage of multiple login strings that can be issued without retyping.

Acer's QA testing of notebooks

All Acer notebooks passed the following quality tests:

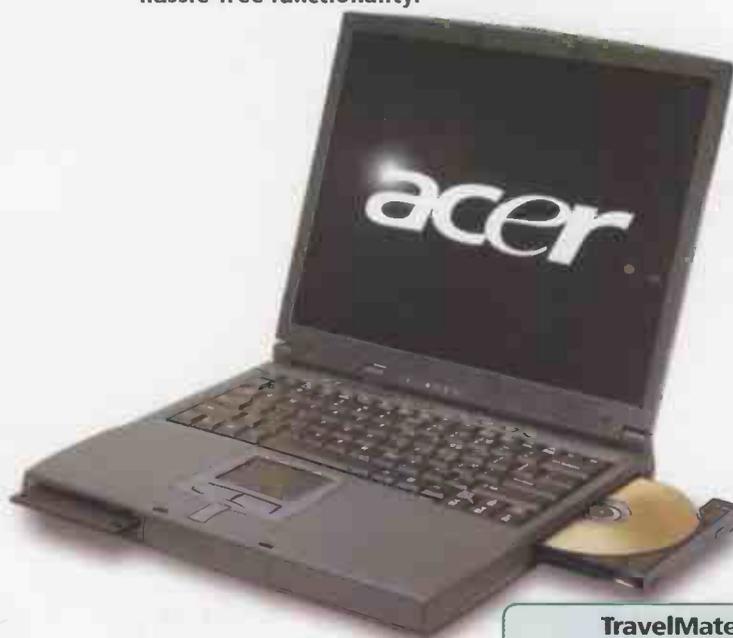
- Hinge Life Test (18,000 cycles)
- Free Drop Test (76cm free drop)
- Shock and Vibration Tests
- Weight Pressure Tests (30kg/cm² for cover, 5kg/cm² for palmrest area)
- Spill Test (1floz)
- ESD (Electro Static Discharge)

Acer PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell

TravelMate 220

A Complete Work Companion

The TravelMate 220, with its all-in-one functionality, is an ideal 'work companion' for outbound business professionals of small and medium-sized companies, as well as SOHO users. Acer has designed the TravelMate 220 to be a compact, but complete tool that provides flexibility as well as hassle-free functionality.



- > All-in-One Solution
- > Complete Multimedia Functionality
- > Easy to Communicate and Connect Wherever You Are

Standard specifications include:

- Mobile Intel® Celeron® Processor
- Built-in 10/100 ethernet and 56kb/s V.90 modem
- Li-Ion battery with average 3 hours battery life
- 14.1" TFT Display
- 128MB RAM (upgradeable to 1GB)
- 10GB Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive, 24x CD-ROM, 8x DVD-ROM or DVD-ROM/CD-RW combo drive*
- Optional DVD or CD-RW drive
- Microsoft® Windows® XP Home Edition or Microsoft® Windows® XP Professional Edition
- 2 years limited warranty



TravelMate 223XC

£999 INC VAT

£849 EX VAT

Mobile Intel® Celeron® Processor at 1.13GHz,
DVD/CD-RW combo drive,
Microsoft® Windows® XP Home Edition

TravelMate 223XV

£869 INC VAT

£739 EX VAT

Mobile Intel® Celeron® Processor at 1.13GHz,
8x DVD-ROM drive,
Microsoft® Windows® XP Home Edition

Acer PCs use genuine Microsoft® Windows®.

www.microsoft.com/piracy/howtotell

Acer Options

InviLink Remote control

£34.08 INC VAT

£29 EX VAT



EasyPort dock

(TM620, TM360)

£99.88 INC VAT

£85 EX VAT



Li-Ion battery charger

£81.08 INC VAT

£69 EX VAT



Li-Ion battery

£105.75 INC VAT

£90 EX VAT

(TM630, TM360, TM260)



Flexible connectivity without cable

- Conform to IEEE 802.11b (11Mbps)
- PCMCIA PC card for Type II slot,
- Access point with dual slots allowing different frequency channels
- Direct Sequence Spread Spectrum
- 2.4GHz frequency, with a maximum speed of 11Mbps (automatic speed selection)
- Encryption software WEP 40
- Interoperable with all other 802.11b standard products
- Wi-Fi compliant (WECA)

Wireless Ethernet Card

£151.58 INC VAT

£129 EX VAT



Wireless Access Point

£410.08 INC VAT

£349 EX VAT



Aspire 1200

Enhanced Workspace

The Aspire™ 1200 has been designed for employees in small businesses, as well as for self-employed professionals who need a complete workplace wherever they are, and want to use it occasionally for leisure and entertainment. It is also ideal for private users who do not want space-consuming PC's, but still need an easily transportable computer for home multimedia, access to the Internet and other private applications.

- > Complete Workplace Wherever You Are
- > Entertainment and Multimedia at its Best
- > Convenient Connectivity for Home and Office

Standard specifications include:

- Intel® Celeron® Processor at 1.0GHz or 1.20GHz
- 14.1" TFT Display
- 4xAGP S3 Savage4™ graphics chipset; DualView support; S-Video TV-out (NTSC/PAL)
- Integrated 10/100Mbps LAN and V.90/56Kbps modem
- Audio DJ (CD playback) functions
- 128MB (upgradeable to 640MB)
- 10GB Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive
- 24x CD-ROM driver or 8x DVD-ROM or DVD-ROM/CD-RW combo drive
- Li-Ion battery
- 2x USB ports; 1x IEEE 1394 "Firewire" port; 1x S-Video output port
- Microsoft® Windows® XP Home Edition
- 2 years limited warranty



Aspire™ 1200XC

£1099 INC VAT

£935.32 EX VAT

Mobile Intel® Celeron® Processor at 1.13GHz,
DVD/CD-RW combo drive,
Microsoft® Windows® XP Home Edition

Combining Work and Leisure Aspire 1400

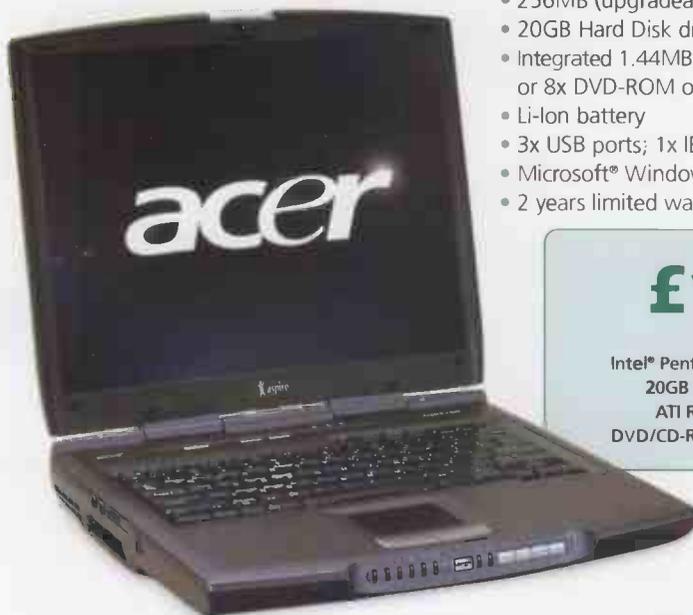
Whether it's a full workplace you want wherever you stay or a state-of-the-art entertainment centre, the Aspire 1400 gives you the best of both worlds. Its advanced connectivity, multimedia functionality, processing power and wide-view display guarantees the best performance be it at work or play.

- > Design
- > Performance
- > Communication



Standard specifications include:

- Intel® Pentium® 4 Processor at 1.70GHz
- 14.1" TFT Display
- Integrated 10/100Mbps LAN and V.90/56Kbps modem
- Audio DJ (CD playback) functions
- 256MB (upgradeable to 640MB)
- 20GB Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive
- 24x CD-ROM driver or 8x DVD-ROM or DVD-ROM/CD-RW combo drive
- Li-Ion battery
- 3x USB ports; 1x IEEE 1394 "Firewire" port 1x S-Video output port
- Microsoft® Windows® XP Home Edition
- 2 years limited warranty



Aspire 1400XC

£1299 INC VAT

£1105.53 EX VAT

Intel® Pentium® 4 Processor at 1.70GHz,
20GB ATA-100 Hard Disk drive,
ATI Radeon 16MB VGA card,
DVD/CD-RW combo drive, 17" Monitor

A3

we hear you

Veriton 3300D

Innovative Convenience for Improved Office Productivity

With industry analysts predicting that the "Small Form Factor" segment will represent more than 50% of the PC market in the coming years, businesses can prepare for a smooth transition to this trend with the new slim-line Veriton 3300D. A robust desktop PC ideally suited for general office environment, it can be positioned either vertically or horizontally, or put conveniently behind an LCD display, to maximise desktop space. But just because it has a stylish slim casing does not mean that performance has been compromised because the Veriton 3300D comes packed with the power of the Intel® Pentium® 4 Processor.

- > Space Saving
- > Performance
- > Connectivity
- > Convenience
- > Security



Standard specifications include:

- Intel® Pentium® 4 Processor with Intel® 845D chipset
- 128MB DDR SDRAM PC2100 (upgradeable to 2GB)
- 20GB ATA-100 Hard Disk drive
- 32MB VGA Card
- Integrated 10/100 ethernet
- 48x CD-ROM drive
- Microsoft® Windows® 98 Second Edition or Microsoft® Windows® 2000
- Security option (iKey)
- Modem Options

Acer PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell

For assistance, support and information:

www.acer.co.uk

Veriton 3300D 1.6

£619 INC VAT

£526.81 EX VAT

Intel® Pentium® 4 Processor 1.60GHz,
 Microsoft® Windows® 98 Second Edition
 or Microsoft® Windows® 2000

TravelMate 630

Mobile & Securely Innovative

The TravelMate 630 series is Acer's response to professional users in small, medium and large corporations looking for desktop functionality, security, everywhere connectivity and advanced modularity in a high quality design notebook PC.



- > Security
- > Desktop functionality
- > Flexible connectivity
- > Quality

Standard specifications include:

- Mobile Intel® Pentium® 4 - M Processor up to 1.60GHz
- Built-in 10/100 ethernet and 802.11b wireless ethernet*, 56kb/s V90 modem for easy connectivity
- Li-Ion battery technology
- 14.1" or "15" TFT Display
- 20GB or 30GB Hard Disk drive
- Integrated SmartCard and 24x CD/DVD-ROM combo drive or optional 1.44MB, 3.5" Floppy Disk drive
- Integrated DVD ROM/CD-RW or 24x CD/DVD-ROM combo drive*
- Optional EasyPort dock
- Optional wireless ethernet card
- Microsoft® Windows® XP Professional Edition
- 2 years limited warranty



Mobile Intel® Pentium® 4 Processor - M



TravelMate 632XV
£1526 INC VAT
 £1299 EX VAT
 Mobile Intel® Pentium® 4 - M Processor at 1.60GHz,
 14" TFT display, 10/100 ethernet,
 20GB hard disk drive, 256MB RAM, DVD

TravelMate 630LC
£1549 INC VAT
 £1318.29 EX VAT
 Mobile Intel® Pentium® 4 - M Processor at 1.40GHz,
 15" TFT display, 10/100 ethernet,
 30GB hard disk drive, 256MB RAM, DVD/CD-RW drive

Acer PCs use genuine Microsoft® Windows®.
www.microsoft.com/piracy/howtotell

For assistance, support and information:
www.acer.co.uk

A5

Aspire 8000

The Acer Aspire™ 8000 with it's sleek design and latest technology will very quickly be regarded as a new member of the family. Providing ease-of-use, programmable keyboard and high performance it will enhance each family member's computing experience and make the world of the computing all the more enjoyable to you.



> Design
Performance
Communication

Standard specifications include:

- Intel® Pentium® 4 or Intel® Celeron™ Processor
- 256MB RAM (upgradeable to 512MB)
- 40GB ATA-100 Hard Disk drive
- 32MB 4x AGP VGA Card
- 12x DVD-ROM drive, 24x 10x 40x CD-RW
- 56k V90 Fax Modem
- 15" or 17" Monitor or LCD Panel
- Microsoft® Windows® XP Home

Aspire 8000
£899 INC VAT
£765.11 EX VAT

Intel® Pentium® 4 Processor at 1.60GHz,
40GB ATA-100 Hard Disk drive, MX200 32MB VGA card,
12x DVD-ROM, CD-RW, 17" Monitor



Acer PCs use genuine Microsoft® Windows®.

www.microsoft.com/piracy/howtotell

Buy now @Acer Point retail outlets

England - South: 3D Computer Systems Chippenham 01249 460766 sales@3d-computers.co.uk • AB Computers Andover 01264 406406 • ABS Technology Haslemere 01428 664900 doug@abs-technology.co.uk • Active Technology Bucks 01296 398561 acersales@activetechnology.co.uk • Alpha Computer Systems Canterbury 01227 472555 sales@alphagroup.co.uk • AR Computing Minehead 01643 707381 neil@arcomputing.co.uk • Ashcom Electronics Surrey 01372 813418 sales@ashcom.co.uk • Avotech Computer Systems Ltd Bristol 01275 462260 • Berrys of Holborn London 0171 405 6231 andy@berrys-holborn.com • Bristol Office Machines Hengrave 01275 890 100 graham.wignall@bom.co.uk • Christchurch Computers Christchurch 01202 486338 sales@cc-c.co.uk • Clinton Computers Bournemouth 01202 526700 sales@clinton-computers.co.uk • Computer Care (South) Ltd Berkshire 0118 939 3615 dave.isherwood@ccare.co.uk • Computer Cavern Bucks 01628 891101 capri@btclick.com • Computer Magic Suffolk 01284 702305 Adminuk@alpha-centuri.com • Computer Village (TCP (IT) Ltd) Bath 01225 405112 mathew@compvill.com • Computer Warehouse Essex 01245 603273 DonBeales@aol.com • Computer Xpress Taunton 01823 272232 info@computer-xpress.co.uk • Computerworld (Western) Ltd Bristol 01454 275400 • Comtec Business Systems Plc Bath 01225 446122 sales@comtecp.com • Connect Tech Communications Ltd (CTC Ltd) Iford 020 8270 9890 connect@aol.com • Database Computers (UK) Ltd Bristol 0117 908 7766 aziz@messages.co.uk • Dataplex Computers Ltd Slough 01753 535557 ramin@dataplex.co.uk • Datasol Computing Ltd 2 branches - Somerset/Glastonbury 01458 440081 sales@dd-ltd.com • DND London 0208 442 9881 mensa@globalnet.co.uk • Eclipse Computers (UK) Ltd Haywards Heath 01444 417985 ben@eclipse-computers.co.uk • Electrowise Newton Abbott 01626 333 350 • Evolution Computer Systems Ltd London 0208 544 0022 • F1 (Returns) Ltd Suffolk 01502 561573 fir@nascr.net • G Squared Computer Systems Ltd Berkshire 0118 931 2727 j.garcha@gsquared.co.uk • GM Computer Systems Cornwall 01726 63942 sales@computersystem.co.uk • ISL Office Solutions Eastleigh 02380 614455 stephenshaw@isloffice.co.uk • J-Searle & Son 2 branches in Devon - Buckfastleigh/Ivybridge 01364 643242 rc@searles.tv • KCS Total Solutions Berkhamstead 01442 396699 sales@kcs-solutions.co.uk • Kinetic Systems London 020 8959 3611 • Logiplus Computer Corporation Ross-on-Wye 01989 769990 • Megabyte Computers Beckenham 020 8676 8488 sales@megabyte-computers.co.uk • Micro Anvika Tottenham Court Road London 0207 467 6000 • Microbitz Computers Somerset 01749 678997 steve@microbitz.co.uk • Orchard Computers Ltd North Somerset 01934 629008 nigel@orchard-computers.co.uk • PC Flying Doctors Saffron Walden 01799 528999 • Portsdown Office Computers Portsmouth 023 92324611 computers@portsdown.co.uk • RL Supplies Ltd Watford 01923 896996 sales@rlsupplies.co.uk • Bruton Computer Ltd 100 01749 813600 • SoSoft Computer Newquay 01637 852666 carl@solsoftsw.com • SRS Microsystems Watford 01923 226602 sales@srsmicrosystems.co.uk • Statacom Computer Ltd Cheam 0208 407 8888 raj@statacom.co.uk • Sweethaven Computers Woodhatch 01737 247090 srambridge@sweethaven.co.uk • System Smart Wiltshire 01672 563062 sales@system-smart.co.uk • Technoworld London 0208 830 5555 sales@technoworld.com • TECRES (Technology Resources) Surrey 01372 370300 lesbeer@tecres.co.uk • The Computer Broker Cirencester 01285 655222 paul@thecomputerbroker.co.uk • The Laptop Man Ltd Dover 01304 827070 paul@thelaptopman.co.uk • The Laptop Shop Brighton 01273 220044 sales@thelaptopshop.co.uk • Titan Computer World Cornwall 01392 252545 sales@titancw.co.uk • TLC Computers Ltd Middlesex 01895 430230 tracey@tlccomputers.co.uk • West Wiltshire Micros Trowbridge 01225 764120 • Wyvern Business Systems Hereford 01432 271233 wbs@wbs.co.uk

Scotland: Comcal (Scotland) Ltd Glasgow 0141 332 5147 • Premier Computing Organisation Ltd Glasgow 0141 221 8716 • Scotnet Aberdeen 01346 519425

Wales: Dinas Computer Services Cardiff 029 2023 1445 iain@dinascomputers.co.uk • Gaia Technology Bangor 01248 374080 johnb@gaia-tech.com • The Computer Store Carmarthen 01267 221661 sales@perfectcomputers.com

Northern Ireland: Lagan Networks Portadown - County Armagh 028 3839 3452

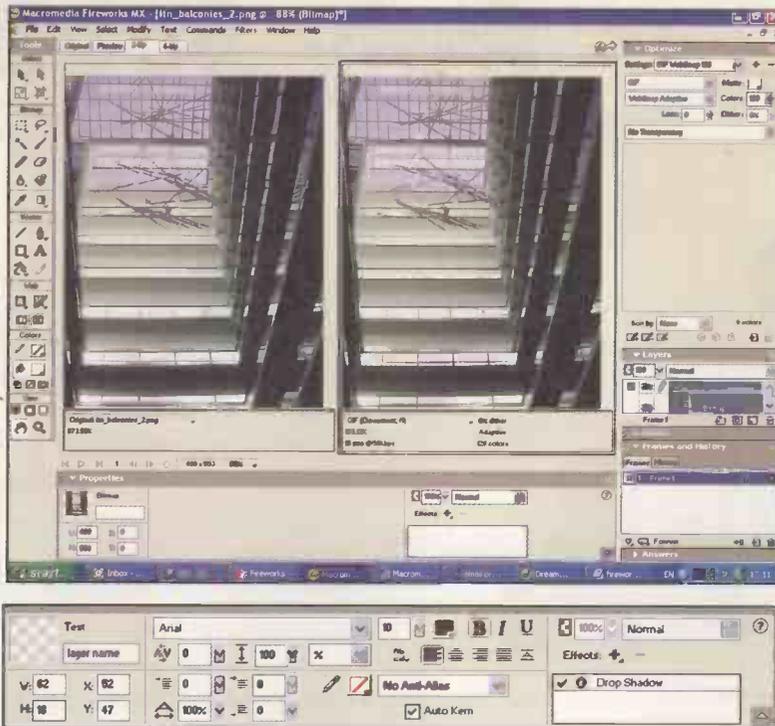
England - Midlands: Abacus Systems (Midlands) Ltd Wolverhampton 01902 650000 shander@abacusweb.net • BEETA International Nuneaton 0247 6350808 frankie@beeta.co.uk • Cavendish Computer Centre Leicester 0116 251 0066 cavcomcen@hotmail.com • Commerce Computers Tefford 01952 820605 simon@commercecomputers.co.uk • Computerbitz Derbyshire 01298 816058 info@cbitz.co.uk • Computerlink (Leicester) Ltd Leicestershire 0116 2333 993 lorraine@computerlink.co.uk • Diamond Computers Dudley 01902 677111 rajb@diamond-computers.co.uk • Ebstar Business Systems Ltd Stoke-on-Trent 01782 286200 • Electronic Business Systems Erdington 0121 384 2513 chrish@e-b-s.co.uk • Electronic Universe Wellingborough 01933 271500 • Ferrastro Ltd T/a Prima Computers Nottingham 0115 916 0000 steve.potter@prima-pc.co.uk • JAL Computer Systems Stoke on Trent 01782 848100 craig@jalsystems.com • JBC Computers PLC Coventry 02476 719800 sales@jbc.co.uk • Know-How Leicestershire 01509 413132 enquiries@know-how.com • Mansfield Computers Mansfield 01623 631202 rita@mansfieldcomputers.co.uk • Microplus Solutions Tamworth 01827 68080 • Midland Computer Solutions Nottingham 01949 877773 sales@midlandcomputersolutions.co.uk • Anyweb PC's Leicester 0115 212 5000 micheler@networkmagic.org • Puma Computers Ltd Tefford 01932 617717 • RAM Computers Birmingham 0121 707 3353 pete@ramcomputers.co.uk • Spa Computer Centre Leamington Spa 01926 337648 sales@spacomputers.com • The Computer Factory 2 branches - Shrewsbury/Birmingham 01939 234882 • Toms Office Technology Ltd Warwickshire 01926 425842 toms@callnetuk.com • Tricom Computers Nottingham 0115 956 5953 sales@4tricom.co.uk

England - North: Alan Kellsall Computer Services Cumbria 01946 64288 alan_kellsall@talk21.com • Alliance Computers Bradford 01274 403040 insan@vmsystems.co.uk • Alnwick Computerware Northumberland 01665 604816 shop@alnwickcomputerware.co.uk • AWK Computers Bolton 01942 812099 wayne@awk.co.uk • Brighthouse Computer Centre West Yorkshire 01484 402030 sales@brighthousecomputers.net • Bytebak Computers Cumbria 01228 562211 • Computer Distribution Huddersfield 01484 453688 • Computer Innovations Huddersfield 01484 350060 • D-Tec Computers Penrith 0768 895600 • Durham Computer Centre Tyneside 0191 386 8989 • Empire Electrical Bradford 01274 575000 • Enabling Computer Supplies Stafford 01785 243111 shaunh@enablingtechnology.net • Easy Computers Huddersfield 01484 319800 • Extra Computers Ltd Bamsley 01226 771117 sales@extracomputers.co.uk • F1 Services Newark 01636 701832 mike@f1services.co.uk • First Direct Computer Systems Preston 01772 202480 • Jilrose Ltd Burnley 01704 884248 mickryan@jilrose.co.uk • M&H Procom Altrincham 0161 926 4400 • Microtec 99 Ltd Oldham 01606 694000 sales@microtec99.co.uk • Middlestown PCs Wakefield 01924 260615 • Mighty Micro Manchester Ltd Manchester 0161 224 8117 • Mittek Newcastle-upon-Tyne 01782 566600 mark@mittecomp.co.uk • Models and Computers Lincolnshire 01205 365102 • Netcomp Computers Ltd Sheffield 0114 258 4414 • PC Concepts Walkden • Performance Computers 3 branches in North Yorkshire - Darlington/Richmond/Northallerton 01609 772442 • Prestige Computer Systems Ltd (Sintel Ltd) Lancashire 01200 424040 Mark@prestigecomputers.com • Pro-Byte Computers Grimsby 01472 235502 martin@pro-byte.co.uk • Pudsey Computers Leeds 0113 236 0650 • R.A.P.I.D. Computer Ltd Chorley 01257 469500 • Rapid Computers Group Liverpool 0151 7220304 sales@rapid.co.uk • Sel Computers Cumbria 015395 33222 • Star Computers Rugby 0870 747 9161 • Systems Express Cumbria • Total Business Systems Gateshead • Tower Digital Blackpool • Triarom Ltd Cumbria 015394 44639 marion@triarom.co.uk • User Friendly Computers Warrington paul@userf.com

Channel Islands: Fotosound (Jersey) Ltd Jersey 01534 758718 fsound@itl.net • HTL Computers 2 branches in St Helier - Jersey 01534 878788 ht@localdial.com

Prices and specifications subject to change without notice. Prices correct at date of publication. Errors and omissions are accepted. These systems are subject to availability. In respect of Third Party Products, the customers should only be entitled to the benefit of any warranty or guarantee given by the Third party manufacturer. Acer, the Acer logo, TravelMate, Veriton, and AcerPower are registered trademarks of Acer Inc. Pentium®, Celeron®, Intel® Inside logo are Trademarks or registered Trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft®, Windows®, Microsoft® Windows® 2000 Professional, and Microsoft® Windows® NT are registered trademarks of Microsoft® Corporation®. All other brands and product names are trademarks or registered trademarks of their respective companies. All sales subject to Acer resellers' standard terms and conditions (available upon request). Optional item prices are only valid if purchased with an Acer system. *Denotes dependant on model.

Right: Fireworks MX's Interface Includes various expandable panels



Below right: The new Property Inspector puts all of an object's attributes in one place



My tool strip's bigger than yours. The expanded tool strip includes a range of functions you'd previously have to conduct in Photoshop

Macromedia Fireworks MX

Manipulating photos for the web has become even easier with this upgrade

We have a soft spot for Photoshop. Not only is it the best photo-editing software on the market, but it's also an essential weapon in the armoury of any serious web developer. Or at least it was, but now Fireworks MX from Macromedia is set to seriously dent its appeal to the semi-professional user. Photoshop will remain the tool of choice for print and high-end photo editing, but the recent growth in several key areas of Macromedia's image-optimisation tool makes you wonder how Photoshop will compete in the web arena.

First up, there's the MX interface consisting of expandable panels, including a Property Inspector (pictured above). A mass of common functions have been included in this context-sensitive strip, cutting down the time it takes to develop graphics for a site.

Take text editing, for instance, which in Fireworks 4 was a laborious process using the canvas and up to three palettes. MX's Property Inspector, though, puts every tool in the same place so you can edit text, change its attributes and position and apply effects from one palette. Text is also now edited on the canvas.

You also have the freedom to use obscure fonts, safe in the knowledge that an image of the text will be saved with your work and rendered on

systems without access to the font itself. Resizing the font-replacement image makes the text editable in a default font rather than rescaling it, which may or may not be a good thing — if you want to treat it as a vector graphic or imported image and resize it, you can't, but if you're simply proofing the document it allows you to make changes for reworking by the original developer. They will have to replace the original font, though, when they reload the document on the original machine.

The tool strip has grown (pictured above right), and its fly-out menus now include blur, burn, dodge, sharpen and smooth tools, giving you more than just level control over how images look. The paint bucket has been joined by a new gradients tool, but the menus for this are not as clear as in Photoshop.

The pop-up menu tool now provides a clearer interface and supplementary options. Menu items and related entries are stored in a directly editable table. Menus can be vertical or horizontal and you can specify the width.

We thought one tool was a bit too ambitious. The reconstitute table function should in theory be able to rebuild a page from an existing table-based layout if you lose the original files. In practice we had difficulties, as it refused to reconstitute pages from any of the sites we tried,

citing invalid HTML as the problem. Fortunately, it seems happy to rebuild pages produced in Dreamweaver MX.

We were impressed by the symbol and library functionality when compared to version 4. Hitting F8 saves your symbol to the library from which it can be duplicated as necessary, and each copy tweaked independently.

Like Dreamweaver, Fireworks is an extensible product, and with an installed base of over 1.3 million users there's a chance that if a function doesn't exist, someone will produce it free. One of the best recent examples of this is shipped with Fireworks MX. This extension will read the data from an XML document, and combine it with a directory of images and a master document to produce new files. Each will contain the textual data from the XML document, an image drawn from the directory, and the effects applied to the master document inside Fireworks. It's an easy way to produce a banner campaign written entirely in Flash.

The added functionality, improved user interface and new photo-editing tools make this a serious threat to Photoshop. Macromedia's figures show that around 50 per cent of Dreamweaver customers also buy Fireworks. We wouldn't be surprised to see that climb with the release of Fireworks MX.

Nik Rawlinson



DETAILS

PRICE £219 (£186.38 ex VAT); upgrade £109 (£92.77 ex VAT)

CONTACT Macromedia
01344 458 600

www.macromedia.com/uk

SYSTEM REQUIREMENTS

300MHz or faster processor, Windows 98SE, ME, NT4 (service pack 6), 2000, XP, 64MB of free Ram (128MB recommended), 800 x 600 (256-colour) display, 80MB of available hard drive space

PROS Intuitive interface; improved menu builder; photo-editing tools

CONS Reconstitute table function is a little over-ambitious

OVERALL The new photo-editing tools and bargain upgrade price should tempt even Fireworks 4 users to put their hands in their pockets. If yours is a first-time purchase or you intend to make a few Javascript menus, then the proposition is even more compelling. Keenly priced for the semi- to fully professional web developer, this represents a major advance in an established and respected product line

SCORE ■■■■■■

NOW WITH **FREE** UPGRADE TO

Athlon XP 2000+ processor
and 32x10x40 CD-RW

FOR THE **SAME GREAT PRICE**

"Truly Sublime"

"A truly sublime experience," even we were surprised to hear one of our computers being talked of in such terms, but Computer Buyer magazine, along with all the other specialist magazines have been unanimous in their praise of the awesome evesham.com Axis 1900+RK. Now featuring an even faster processor and CD-RW this system offers tremendous value for money.



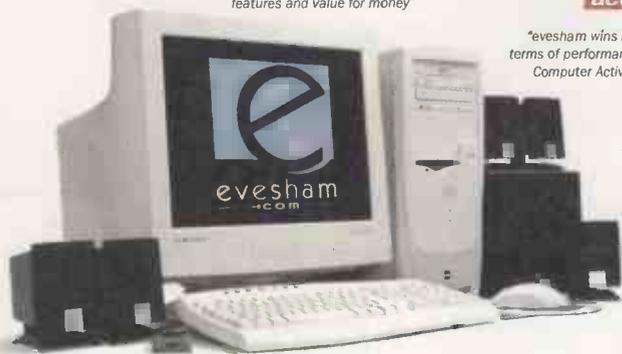
"every component in its make-up is top quality"



"unbeatable combination of features and value for money"



"evesham wins hands down in terms of performance and features" Computer Active, May, 2002



"The Samsung CRT monitor offers excellent performance."



"A stunning selection of top-notch hardware"



"We've come to have high expectations of evesham, but this time the company really has surpassed itself."

Go AXIS 2000+RK e-code AX1061-07

- AMD Athlon XP 2000+ (1.67GHz) Processor
- Asus A7V333 motherboard with Via KT333 chipset and USB 2.0
- 512MB DDR RAM (PC2100) (2x256MB)
- 80GB 7200rpm UDMA100 hard drive with 2MB buffer
- 64MB DDR ATI Radeon 8500LE graphics with TV-out & DVI
- 19" (18" visible) Samsung SM957 DynaFlat monitor
- 16x DVD-ROM drive
- CD-RW drive (32x10x40) with Justlink BURN proof technology
- v92 56k Internet ready modem
- Sound Blaster Audigy Dolby Surround & Firewire (OEM)
- Cambridge Soundworks DTT5300 Inspire 5.1 Five Point Surround speakers
- Microsoft Internet Keyboard & Logitech Optical Wheel Mouse
- Pinnacle Studio 7 SE (OEM) video editing software



£1049^{ex} VAT (£1232.58)

AXIS 1800+KD

e-code AX1048-07

- AMD Athlon XP 1800+ (1.533GHz) Processor
- 256MB DDR RAM (PC2100)
- 40GB UDMA100 hard drive with buffer
- 64MB nVIDIA GeForce4 MX420 graphics with TV-out
- 17" (16" visible) evesham EZ Flat monitor
- 16x DVD-ROM drive
- CD-RW drive (32x10x40) with Justlink BURN-proof technology
- v92 56k Internet ready modem
- C-Media Sound Blaster compatible 6 channel audio
- Cambridge Soundworks Four Point Surround speakers

£799^{ex} VAT (£938.83)

"An excellent system"
COMPUTER BUYER

Highly Commended
PCW



• AXIS & EVOLUTION STANDARD FEATURES : 4 x USB ports (2 front mounted), 3.5" floppy disk drive, Midi-tower case (420x198x465), Ultratouch keyboard & Logitech wheel mouse (unless otherwise stated), DVD movie playback, 3 year warranty (2 years on-site), lifetime national rate technical support, 24x7 on-line support, Windows XP Home and BigFix software installed.

AXIS 1900+SK

e-code AX1060-07

- AMD Athlon XP 1900+ (1.6GHz) Processor
- 256MB DDR RAM (PC2100)
- 60GB 7200rpm UDMA100 hard drive with 2MB buffer
- 64MB DDR ATI Radeon 7500 graphics with TV-out & DVI
- 17" (16" visible) LG Flatron 795FT monitor
- 16x DVD-ROM drive
- CD-RW drive (32x10x40) with Justlink BURN-proof technology
- Firewire card (IEEE1394)
- v92 56k Internet ready modem
- C-Media 6 channel Sound Blaster compatible sound
- Cambridge Soundworks DTT5300 Inspire 5.1 Five Point Surround speakers

£899^{ex} VAT (£1056.33)

"Sets a terrifying precedent to other manufacturers"



AXIS 2000+GF44

e-code AX1049-07

- AMD Athlon XP 2000+ (1.67GHz) Processor
- Asus A7V333 motherboard with Via KT333 chipset and USB 2.0
- 512MB DDR RAM (PC2100) (2x256MB)
- 100GB Western Digital 7200rpm UDMA100 hard drive with 8MB Buffer
- 128MB nVIDIA GeForce4 Ti4400 graphics with TV-out & DVI
- 19" (18" visible) Samsung SM957 DynaFlat monitor
- 16x DVD-ROM drive
- CD-RW drive (32x10x40) with Justlink BURN-proof technology
- v92 56k Internet ready modem
- Sound Blaster Audigy Dolby Surround & Firewire (OEM)
- Cambridge Soundworks DTT5300 Inspire 5.1 Five Point Surround speakers
- Microsoft Internet Keyboard & Logitech Optical Wheel Mouse

£1199^{ex} VAT (£1408.83)



UPGRADES

Microsoft WorksSuite 2002 **£40^{ex} VAT (£47.00)**

Microsoft Office XP SBE **£160^{ex} VAT (£188.00)**

(When purchased with an evesham PC)

Upgrade to 3 years on-site warranty (systems with 3yr warranty) **£29^{ex} VAT (£34.08)**

AWARD WINNING SUPPORT

At evesham.com it's all about the service we offer. With all evesham PCs, we supply a 2 year on-site hardware warranty with a 3rd year return-to-base warranty.

- Lifetime telephone technical support (national rate)
- 24x7 on-line technical support
- BigFix software installed



Price does not include delivery which is £34+VAT (£39.95) - UK mainland only. All systems and upgrades are subject to availability. Including VAT pricing is displayed within brackets. Prices correct at date of publication. Price and specifications subject to change without notice. Finance is subject to status. evesham.com's Terms and Conditions apply and are available on request. evesham.com is a division of Evesham Technology Ltd. Actual products may not match photographic representations. On-site warranty is for hardware faults only, we will endeavour to resolve configuration issues via our support line. Technical Support opening hours are Monday to Saturday 9:00 to 17:20. On-site warranty applies to UK mainland only (this does not include Isle of Man or Isle of Wight), and covers base unit only. Monitors are covered by 2 year swap-out warranty dealt directly by the monitor manufacturer. Upgrade to warranty available to customers in Northern Ireland, 2 years cover for £100+VAT. Reviews and awards have been attributed to these systems with their previous names. Featured systems are based upon the original award winning specification. Bundled versions of video cards, sound cards and software are not full retail packs, and the software features online documentation. Cards with TV out functions provide composite video output not RF output. All DVD-ROM drives are supplied set to region 2. We do not support the use of other regions on evesham PCs. You will require special permission to copy CDs that are copyright. Hard disk capacities are quoted in thousands of millions of bytes (as is standard industry practice) and are prior to installation of operating systems and other applications. As part of our staff training some telephone calls may be monitored. AMD, AMD Athlon and AMD Duron are trademarks of Advanced Micro Devices. Intel, the Intel Inside logo and Pentium 4 are trademarks of the corporation. E&OE.

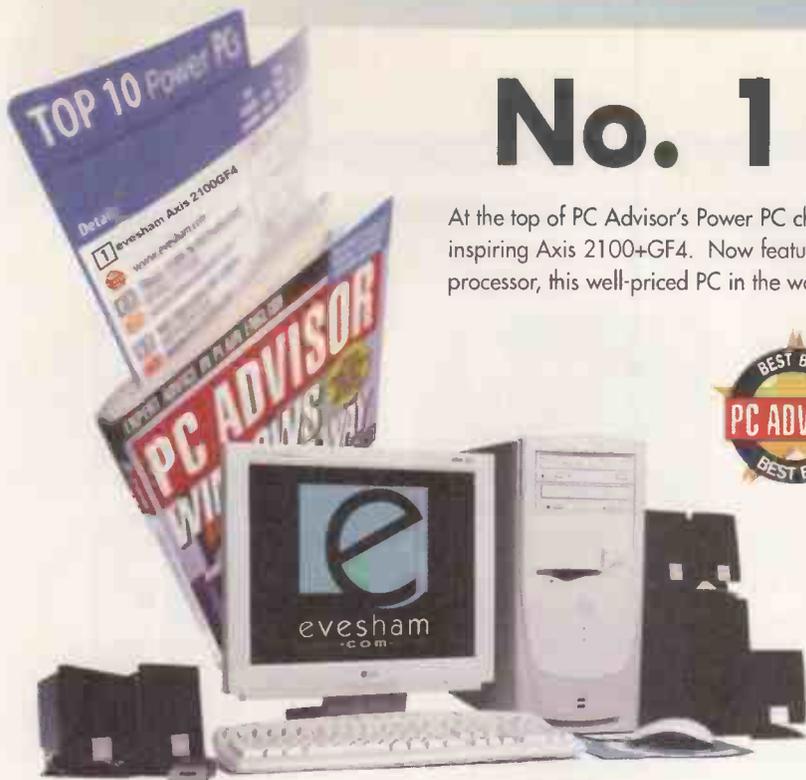


Buy now pay December 2002

0870 160 9530

No. 1 Power PC

At the top of PC Advisor's Power PC chart for the second month running, it's hard to fault the awe-inspiring Axis 2100+GF4. Now featuring a free upgrade to AMD's fastest ever Athlon XP 2100+ processor, this well-priced PC in the words of PC Advisor is "close to being the perfect Power PC."



AXIS 2100+GF4 e-code AX1062-07

- **AMD Athlon XP 2100+ (1.73GHz) Processor**
- Asus A7V333 motherboard with Via KT333 chipset and USB 2.0
- 512MB DDR RAM (PC2100) (2x256MB)
- 100GB Western Digital 7200rpm UDMA100 hard drive with 8MB Buffer
- 128MB nVIDIA GeForce4 Ti4600 Ultra graphics with TV-out & DVI
- 19" (18" visible) LG Flatron 915FT+ monitor
- 16x DVD-ROM drive
- MIRAI CD-RW drive (40x12x48) with BURN-Proof and Zone CLV technology
- v92 56k Internet ready modem
- Sound Blaster Audigy Dolby Surround & Firewire (OEM)
- Cambridge Soundworks DTT5300 Inspire 5.1 Five Point Surround speakers
- Microsoft Internet Keyboard & Logitech Optical Wheel Mouse

As pictured with
Pure Digital 17" LG 782LE DVI TFT monitor for **£1659...** (£1949.33)

£1399 ex VAT (**£1643.83**)

T.V. ENABLED

WORLD CUP EXTRA...



It's a PC, it's a TV, it's a Digital Video Recorder (DVR), it's a DVD player and it's ready for the World Cup. Yes a powerful PC can double up as a flexible TV/DVR using the award winning SHOWSHIFTER SOFTWARE and our built in TV Tuner. Showshifter gives you advanced TiVo® like facilities including pausing live TV (time shifting) and instant replays.

The new Celeron 1.7GHz sets a new standard in terms of MHz per £££ and uses the latest Intel P4 platform. Both Evolution World Cup Specials can be upgraded to the new P4 2.4GHz processor.



EVOLUTION 1.7 SPECIAL e-code EV1029-07

- Intel Celeron 1.7GHz processor - **UPGRADEABLE TO P4 2.4GHz PROCESSOR**
- 256MB DDR RAM (PC2100)
- 60GB 5400rpm UDMA100 hard drive with 2MB buffer
- Direct 2D/3D graphics
- **TV tuner card with Showshifter software**
- 17" (16" visible) evesham EZ evesham Flat monitor
- 16x DVD-ROM drive
- CD-RW drive (16x10x40) with Justlink BURN proof technology
- v92 56k Internet ready modem
- On-board audio
- Cambridge Soundworks SBS35 speakers
- Mini Tower case (352x180x373)



UPGRADE TO: EVOLUTION P4 2.0 SPECIAL

e-code EV1030-07

- Intel Pentium 4 2GHz Processor
- 80GB 5400rpm UDMA100 hard drive with 2MB buffer
- 17" (16" visible) LG Flatron 795FT monitor
- 64MB SDR ATI Radeon 7500 graphics with TV-out and DVI
- CD-RW drive (32x10x40) with Justlink BURN proof technology
- Midi-tower case (420x198x465)

£935.32 ex VAT (**£1099**)



EVOLUTION 2200DLX e-code EV1020-07

- Intel Pentium 4 2.2GHz processor with 512KB on die cache
- 512MB DDR RAM (PC2100) (2x256MB)
- 100GB Western Digital 7200rpm UDMA100 hard drive with 8MB buffer
- 128MB nVIDIA GeForce4 Ti4600 Ultra graphics with TV-out & DVI
- 19" (18" visible) LG Flatron 915FT+ monitor
- 16x DVD-ROM drive
- MIRAI CD-RW drive (40x12x48) with BURN-proof & Zone CLV technology
- v92 56k Internet ready modem
- Sound Blaster Audigy Dolby Surround & Firewire (OEM)
- Cambridge Soundworks DTT5300 Inspire 5.1 Five Point Surround speakers
- Microsoft Internet Keyboard & Logitech Optical Wheel Mouse

£1399 ex VAT (**£1643.83**)

With Pure Digital 17" LG 782LE DVI TFT monitor for **£1659...** (£1949.33)

UPGRADES

Monitor Upgrades

evesham.com PCs use genuine Windows® Operating Systems
www.microsoft.com/piracy/howtotell

	to: 17" LG FLATRON 795FT	to: 19" Samsung SM957 DF	to: 19" LG FLATRON 915FT+	to: 15" LG 563LE TFT	to: 15" Samsung SM151D DVI TFT	to: 17" LG 782LE DVI TFT	to: 18" LG L1800P DVI TFT
from: 17" evesham EZ Flat	£54 (£63.45)	£91 (£106.93)	£144 (£175.08)	£210 (£246.75)	£206 (£242.05)	£408 (£479.40)	£657 (£771.98)
from: 17" LG Flatron 795FT		£38 (£44.65)	£90 (£105.75)	£158 (£185.65)	£152 (£178.60)	£355 (£417.13)	£603 (£708.53)
from: 19" Samsung SM957 DF			£53 (£62.28)	£121 (£142.18)	£115 (£135.13)	£318 (£373.65)	£566 (£665.05)
from: 19" LG Flatron 915FT+				£68 (£79.90)	£63 (£74.03)	£260 (£305.50)	£513 (£602.78)



Are those models which we try to keep in stock for immediate despatch

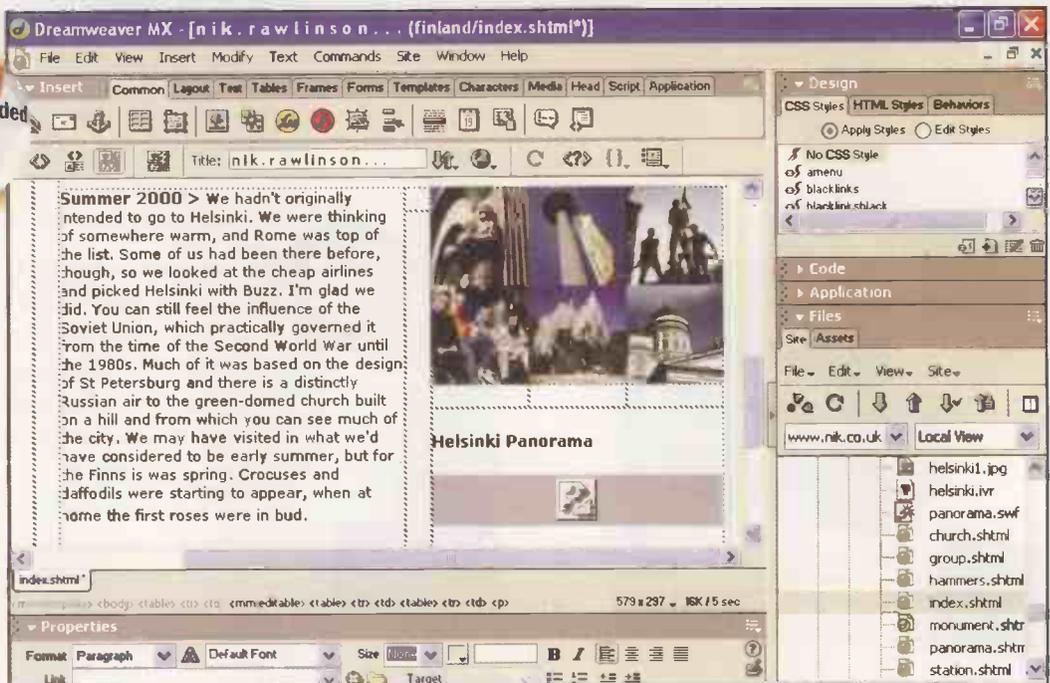
To visit your nearest showroom call
0870 160 9800

Altrincham | Birmingham | Bristol | Cambridge | Croydon
Evesham | Glasgow | Leeds | London | Milton Keynes | Norwich
Nottingham | Peterborough | Reading | Southampton | Swansea

www.evesham.com

0870 160 9530





Perhaps unfamiliar at first, you'll soon be working faster than ever with the new Dreamweaver



Macromedia Dreamweaver MX

Power and ease of use combine to make this web design tool a market leader

Happy birthday! Dreamweaver is five years old. In software years, that makes it middle aged. But Dreamweaver is far from going through a mid-life crisis, it has been reborn; fitter, faster and much, much stronger. Users of Dreamweaver 4, the web design tool that has captured 87 per cent of the North American market for professional web development, will hardly believe that possible, but we speak the truth.

You'll probably be as surprised as we were to discover that the most common Dreamweaver-related tech-support query relates to the site definition dialogue box. This is the screen used to define how and where your files are saved and uploaded. It seems only logical, then, that

Dreamweaver MX now features a site wizard, particularly as this release includes the full functionality of the previously separate Ultradev. This is no longer simply a page layout tool; it is also an online application builder, with support for PHP, ASP, ASP.Net and Web Services, JSP and, of course, Coldfusion.

Now for the technical bits. Although there is no assumption that you already know what any of these technologies are, the standalone developer should be prepared to perform some server-type tweaking on their PC. There is no bundled web server so if you are running Windows ME or XP Home you'll have to go out and download one, while Windows 98, 2000 and XP Professional users can opt for IIS or PWS. Likewise, depending on

your technology of choice you may find yourself hunting down PHP, MySQL or Jrun. It is a shame Macromedia didn't include these as part of the default install, but then you could argue that with PHP and MySQL being open source it would have ended up shipping outdated code sooner rather than later.

We were also disappointed that there is still no easier way to define which files should be transferred to the remote server in Ascii mode than to manually edit a configuration file. However, as you'll probably only ever need to add one or two extensions to the already impressive default list, it's not too great a chore.

The 'new file' dialogue box has been expanded to include a templates

DETAILS

PRICE £299 (£254.47 ex VAT); upgrade £149 (£126.81 ex VAT)

CONTACT Macromedia
www.macromedia.com/uk

SYSTEM REQUIREMENTS
300MHz or faster processor, Windows 98, 2000, NT, ME, XP, Netscape Navigator 4 and above or Internet Explorer 4 and above, 96MB of Ram (128MB recommended), 275MB of free hard drive space, 256-colour monitor capable of 800 x 600 (1,024 x 768 recommended)

PROS Easy database manipulation; powerful interface

CONS Not all functions (for example some template features) are backwards compatible

OVERALL Adobe was closing in on Macromedia in terms of functionality and ease of use with the launch of Go Live 6, but Dreamweaver MX sees Macromedia streaking ahead once again. Power, ease of use and speed finally come together at the bargain price of £299

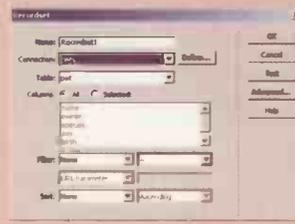
SCORE ██████████

SEVEN STEPS TO A DATABASE-DRIVEN WEBSITE USING MYSQL AND PHP

1 Connect to the database by opening a new page, clicking the bindings tab and completing the dialogue box.



2 Select the database in the connection box, and the relevant table, then click OK.



3 Click the dynamic table button to define the area that will display the database contents.



page, which draws together the templates from every defined site, making it easier to base a new site or page on existing work.

Nested templates

Of even greater benefit, though, is a brand new feature, nested templates. Macromedia has recognised that while many sites have a unified skin, some subsections would benefit from slight differentiation – for example, a unique menu. Nested templates allow you to lay out an overall design that permeates the whole site, while containing further sub-templates. Redesigning one of these sub-templates will only change those pages that specifically make use of it, while amending the site-wide template will affect every page in the site.

'Optional' regions take this flexibility to a third level. Anything set as an optional region within a template will be displayed by default on all dependent pages. It can, however, be simply switched off on an individual page. The most common use for this would be in a templated menu bar, where you might want to make the link to the current page 'disappear' to maximise screen space and avoid confusion.

Optional regions and nesting reduce the number of templates you'll need to produce when developing large sites, and will likely prove a godsend for developers of small sites with hosting packages that don't offer SSI (server side includes). It's not an efficient replacement – it will, after all, mean uploading every affected page – but it is the only viable alternative if you want to avoid considerable manual recoding.

Sadly, Macromedia has rewritten the template engine to make these functions possible and, as a result, editable regions within Dreamweaver MX templates are not recognised by Dreamweaver 4. Nor is there any way to

export version 4-compliant versions of an MX template, which could be a problem for an organisation considering a staggered switch from 4 to MX.

It is in designing templates that you come to appreciate the speed and flexibility afforded through the integration of the MX interface. MX is more than just Dreamweaver, it is a Macromedia strategy, one part of which is a flexible, customisable interface. This includes Dreamweaver's Insert toolstrip, which is organised into context-sensitive tabbed pages; developing with PHP, for example, adds a PHP tab featuring the relevant tools.

The template tab of this toolstrip gives you one-click operations for defining editable regions, optional regions and nested-template placement. Previously you had to trawl through a series of menus, and even then achieve only half as much as you can here.

By reducing the amount of code used to define a table, Dreamweaver MX considerably reduces the size and complexity of a page. It now specifies cell widths only on first-row cells, and heights only in the first column rather than on every <tr> and <td> tag. Not only will this make your pages download slightly quicker, it also makes rewriting the page in code rather than design-view far easier.

Help for first-timers

Code hinting may finally tempt first-time coders to join the majority of Dreamweaver developers who at some point dump the mouse and hit the keyboard. The Dreamweaver MX code-editing view has fully context-sensitive Word-like autocomplete functions. Type '<a h', for example, and it will suggest that you mean '<a href'. Expand this to '<a href="index.htm" class=' and it will display a list of styles drawn from the style sheet attached to or defined within the current page.

Right-clicking on a link gives access to the tag editor, a dialogue of entry boxes for defining attributes relevant to the tag. Each is accompanied by an icon to indicate the browsers with which it is compatible, and is linked to Dreamweaver's integrated reference works, to save you switching between the dialogue and reference panel.

However they were developed, your pages will benefit from a reworking with Dreamweaver MX, but its real power is in developing dynamic sites.

We used PHP and MySQL, running IIS under Windows 2000 Professional, to produce a web-based contacts database. Connecting to the database, which need be no more than an empty table at this stage, is a simple matter of binding it to the page. Once bound, a range of application-specific tools practically negate any requirement to understand SQL commands. Single-click operations add navigation elements for moving forwards and backwards through records, or jumping to the beginning or end of the results list.

Anyone with a rudimentary understanding of visual page design should be able to pass attributes from one page to another. Once you have defined a standard form, the form action can be pointed at your results page, which in turn will pick up the content of the input field for use as a search term, pulling all matching results out of the database. Our step-by-step guide (below) shows how quickly a database-driven site can be established.

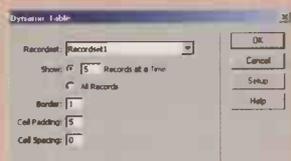
With equivalent functionality for the most common web development platforms, professional developers should be worried. When the general public discovers how easy it is to build database-driven sites with an application that costs about the same as four hours of a developer's time, they could be out of a job.

Nik Rawlinson

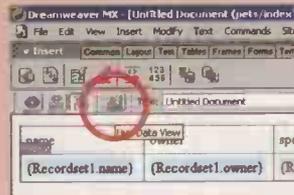


The MX Interface maximises screen use with collapsible panels

4 The dynamic table dialogue appears. All you need do is tell it how many records you would like to display at a time.



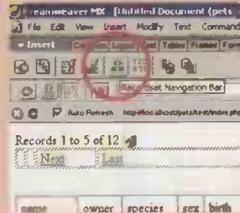
5 Now that the table is on your page, click the Live Data View button to populate it using your database.



6 Click Recordset Navigation Status to add a line indicating the record numbers on view.



7 Add control buttons by clicking Recordset Navigation Bar and the necessary links will appear.



Can your web

1&1 became Europe's biggest web host by offering turn key all inclusive web solutions at affordable prices.

1 1&1 VOTED NO.1



The readers of .NET, PC Plus, Internet Works, Internet Advisor and PC Guide voted 1&1 as best web host.



1 FREE EXPRESS SUPPORT

For all customer service needs we provide friendly phone, email and online live help support.



INSTANT DOMAIN NAME REGISTRATION

.co.uk

£2.89

per year

- 50 free e-mail addresses e.g. myChoice@myDomain.com.
- Unlimited e-mail forwarding.
- Free website forwarding (domain remains in the address bar).
- Domain parking, with no further action required.
- 1&1 Group is an accredited registrar with ICANN, Nominet, Afiliass...
- total price per year + vat • no release fees • no hidden charges

.com/.net/.org £ 8.99
.info £ 8.99
.biz £ 8.49
incl. all registration fees

1 3,000 MBIT CONNECTIVITY

1 OWN £7M DATA CENTRE



Latest hardware from Compaq, Cisco and Juniper ensures superior speed and 99.9% uptime.



Benefit from fibre-optic connectivity to our own backbone and 7 different leading carriers.

1 FREE CONTROL PANEL



Manage all your account settings easily using our live, fully featured web based control panel.

1&1 now hosting

2,509,494

Domains... and counting
Transfer your existing domain to 1&1 for free!

Nine Years' Experience

1&1 was one of the first companies in Europe to offer webhosting. Today we employ 850 professionals and 60 in-house developers to design our state-of-the-art services. 1500 servers are currently in operation in our own sophisticated data centre. This gives you superior reliability and security. We are part of a large public company.

1&1 is No. 1 in Europe

Many small providers discontinue their service these days, leaving your site stranded offline. Reason enough for you to rely on 1&1, Europe's biggest web host. 1,300,000 other customers already do and 2,500 new customers currently join 1&1 every day – of which only 1 cancels per day. We're still working on this!

host do this?

Our leading-edge services are easy to use and are optimised for the needs of home users & small to medium sized companies.

100% SATISFACTION



NEW FREE WEBSITECREATOR

Create your website online in 20 mins using our great designs and an easy Word like editor.



Testdrive 1&1 without any risk! Get a full refund for 60 days if you are not totally satisfied!

→ ALL INCLUSIVE WEB HOSTING

starters

£1.49

- Up to 600 MB web space included.
- Up to 500 POP3 e-mail boxes with forwarding included.
- Up to 40,000 MB traffic included.
- NEW Password protection and sub domains in selected packages.
- Visit OneAndOne.co.uk for many more great features...
- total monthly price + vat • one-off set up fee £9.99 • no hidden charges • termination anytime

home	£ 4. ⁹⁹
business	£ 8. ⁹⁹
professionals	£16. ⁹⁹

1 FREE SOFTWARE



Receive full unlimited versions of Fusion MX, Picture Publisher 10 and many more worth £400.

NEW FREE VIRUS SCANNING



Automatic scanning of all emails on the border of our network before they reach your inbox.

NEW FREE WEBMAIL



Send & receive emails anytime, anywhere under your own domain name using just a browser.

Why do we have the best prices?

Having registered 2,500,000 domains and hosting more than 900,000 websites, we can purchase our 3,000 MBit of bandwidth, 160 terabyte of monthly traffic, routers and servers at very good rates. We are glad to pass our savings on to you, naturally without compromising quality, speed and support.

Visit us now:

OneAndOne.co.uk

or call 0845 6012 586

1&1



IMAGE *is* EVERYTHING

Your vision is the key to your performance. At every stage of each working day your display provides access to the information you need.

CTX understands the importance of image. That's why our range of energy-saving slimline LCDs is designed to combine super sharp flicker-free pictures with unrivalled reliability and style.

Get the right image. See CTX.

PV720(A)

Actual Screen Size: 17"
Screen Type: TFT
Colours: 16.7 Million
Contrast Ratio: 350:1
Brightness: 250cd/m
Pixel Pitch: 0.264 mm
Rec. Resolution: 1280 x 1024
Horizontal Sync: 30 to 82 kHz
Vertical Sync: 58 to 75 Hz
Viewing angle: Horiz :120 Vert :115
Regulations: TCO 99
Multimedia: YES
Weight: 7.5kgs

www.ctxeurope.com



©2002 CTX Europe Ltd. All rights reserved. Specifications are subject to change without notice.

CTX

COMMITTED TO XCELLENCE

> CRT DISPLAYS > LCD DISPLAYS > PROJECTORS > PLASMA SCREENS >

Powerquest Drive Image 2002

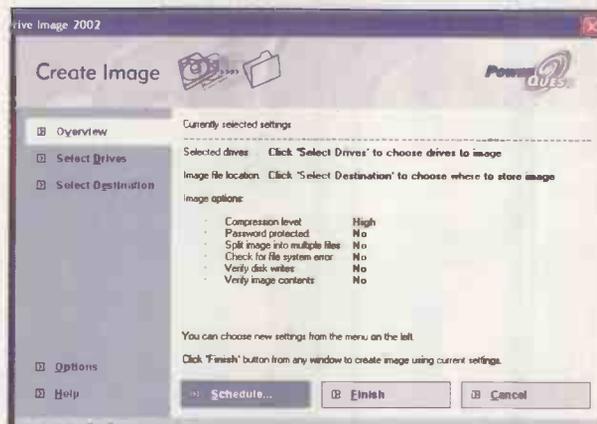
Backing up your hard drive couldn't be easier

Protecting your data has become easier with the new release of Powerquest's Drive Image 2002. This adds features from the company's hard drive partitioning software, Partition Magic, and comes with an updated look and feel.

Drive Image makes an image of your data or hard drive for recovery or backup purposes. This release enables you to work within Windows until you hit the button to do the desired tasks, then the PC reboots into Dos and gets on with the job.

The main new feature strikes you as soon as you open the application. A wizard invites you to make an initial backup of your PC. This wizard checks your drive, then checks for a destination partition for the image you are about to create. Ordinarily you would use Partition Magic to create this partition, unless you had the foresight to do it when you installed Windows.

Drive Image 2002, however, includes some Partition Magic features and will



Drive Image 2002's wizard does all the work for you

create a partition for images that is hidden by default. It can also reallocate free space and delete a backup partition. If you want to convert or resize a partition you will still need Partition Magic, but many users will find that Drive Image has all they require.

The other new features are less exciting for home users. Lan support has been added, to allow image creation and restoration across a network. You also get limited imaging within Windows,

without booting to Dos. This does not include the Windows or System partition, so you'll require a minimum of three partitions (Windows, data and backup) to make use of this feature.

Drive Image 2002 is well worth while if you do not own any other Powerquest software. However, it's less essential if you currently use Partition Magic and Drive Image as individual packages and are looking to upgrade.

Leo Waldoock

DETAILS

PRICE £39.95 (£34 ex VAT)

CONTACT Powerquest
0118 945 0200

www.powerquest.com

SYSTEM REQUIREMENTS

Pentium-compatible processor,
20MB of hard drive space, Windows
9x, ME, NT4, 2000, XP

PROS An excellent Windows
interface and you get some Partition
Magic tools included

CONS Very few new features for
the home user

OVERALL While there's no real
reason to upgrade, some interesting
new features make this software
very good value

SCORE ■■■■■

Pure Motion Edit Studio 3

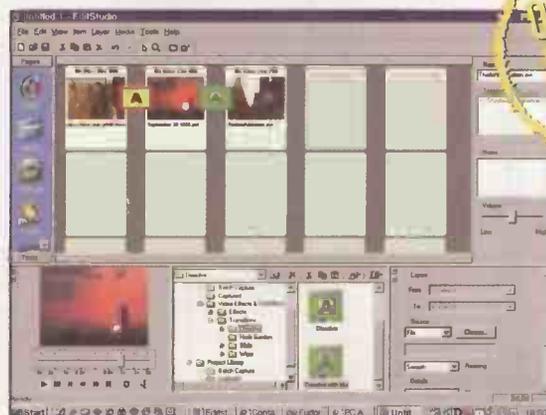
A reasonably priced video-editing package

Video-editing software has helped to reduce some of the panic induced when you're invited to watch a friend's holiday video. Even the most cack-handed videographers can now easily tart up their holiday footage into something vaguely entertaining. Edit Studio is aimed at the amateur and offers many professional features at an entry-level price.

Getting video clips into Edit Studio is straightforward as the software can capture from both analogue and DV devices. It even has a scene detection mode to automatically break up footage into manageable chunks for editing.

The main addition to version 3 is the storyboard edit mode. You can quickly and easily create a movie by dragging and dropping clips into separate boxes on the storyboard grid and then selecting a transition effect for each edit. If you've got a short attention span this is all the editing you'll need to do.

However, if you're more ambitious you'll want to delve into the timeline edit



Editing in
storyboard
mode is
very easy

mode. This takes a more traditional approach with the video clips laid out in horizontal strips across the screen. You can also stack an unlimited number of layers on top of each other containing media such as video effects, still images and soundtracks and raw video clips.

Unfortunately, the storyboard mode's ease of use hasn't been carried over into timeline editing. Some basic functions are overly complicated. For example, creating transition effects is a real chore and, because the end result effectively becomes a self-contained

video clip, it's not always easy to differentiate between the original footage and the transition clip.

Another downside is cost; a boxed copy is £30 more expensive than Ulead's Video Studio 6 and, while this has more editing features, you have to shell out an extra £20 to purchase the mpeg XS plug-in to export finished footage in a format suitable for Video CDs or DVDs. Even with the mpeg plug-in you can't burn VCDs or DVDs directly from within the package.

Niall Magennis

DETAILS

PRICE £59 (£50.21 ex VAT) for
download, £79 (£67.23 ex VAT) boxed

CONTACT Pure Motion
07092 265 529 (premium rate)
www.puremotion.com

SYSTEM REQUIREMENTS

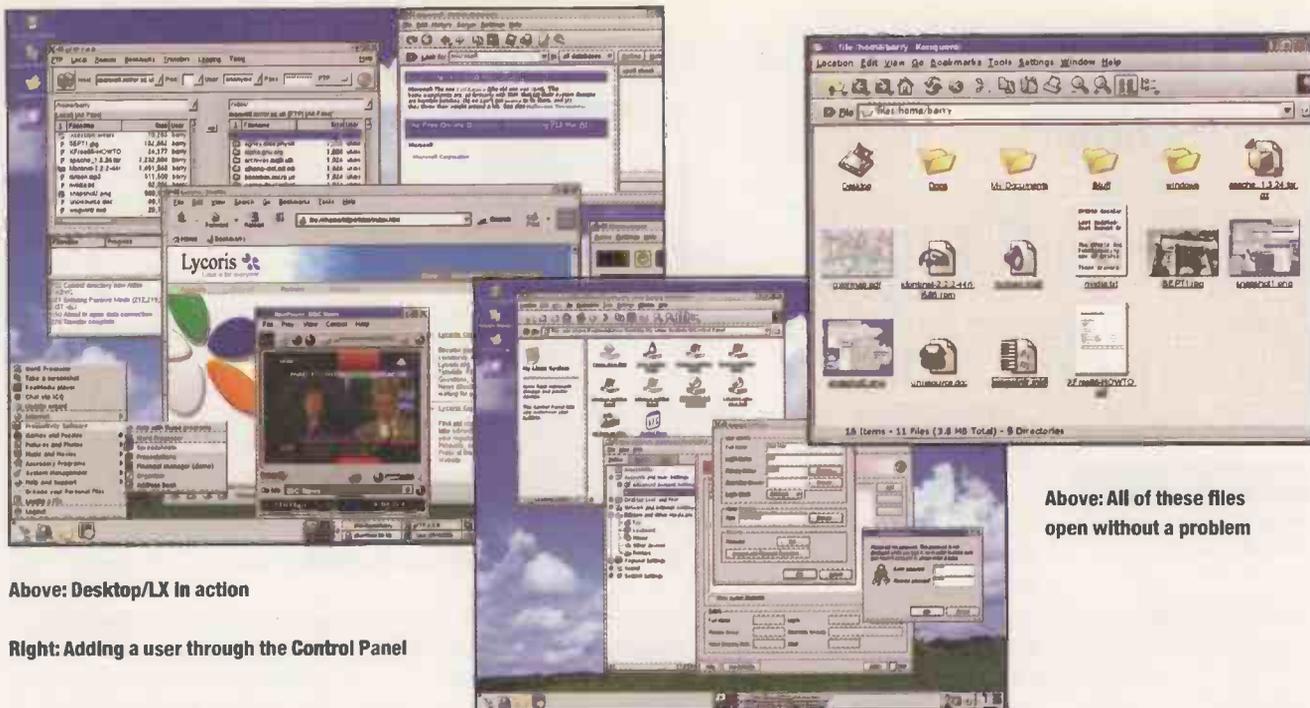
Windows 98 SE and later, 350MHz PII,
64MB of Ram, 4GB of hard disk
space, analogue or DV capture device

PROS Storyboard mode; features

CONS Need mpeg-Xs plug-in for
mpeg-2 export support; timeline
editing can be awkward

OVERALL Edit Studio 3 has a
wealth of features and an excellent
storyboard edit mode. However, it is
more expensive than many rivals and
the timeline editing can be awkward

SCORE ■■■■■



Above: Desktop/LX In action

Right: Adding a user through the Control Panel

Above: All of these files open without a problem

Lycoris Desktop/LX

If you want to use Linux but want the look and feel of Windows, take a look at this

Winning over the home desktop market is something many Linux distributors are aiming to do and usability is one way of achieving this. Following this line of thinking, Redmond, Washington-based Lycoris has launched Desktop/LX.

This provides a look and feel familiar to Windows users, and the screenshots above show a similarity to XP, but that is where the similarity ends. Desktop/LX is still a Linux system based on the KDE desktop, with a collection of some of the most popular KDE applications. The first version, Amethyst, has received praise from the Linux community for its easy installation and configuration. It is due a new release, Update 2, and we review the release candidate here.

Desktop/LX is based on Caldera's Open Linux and uses a modified version of the 'Lizard' installation program: Lyzard. The first surprise is how easy and fast the installation is, taking around 15 minutes.

Lyzard successfully detected and configured all of the installation PC's components: the wheel mouse, Soundblaster Live card, CD-RW, Ethernet card and modem, and even the USB-connected HP 950C printer. Our Nvidia Geforce3 TI200 and monitor were identified and resolutions were listed and could be tested. This way the graphical setup is confirmed and working before

the hard disk is touched. Many technical questions are also avoided. For example, Linux distributions usually ask for the keyboard type to be set with lines such as 'generic 104-key keyboard'. Desktop/LX instead uses the 'standard keyboard with Windows keys'.

The disk configuration section is a concern when you're installing onto a system with an existing Windows installation. Desktop/LX makes this as easy as a dual-booting Windows-only system. Like most distributions, it will detect existing Linux partitions and use those, or allow you to create new partitions in free space. Unusually, the choice of filesystem is taken away, and the standard journalled ext3 filesystem is automatically used instead.

After configuration on network, printer and timezone settings, the bootloader is installed – automatically detecting Windows. The KDE login screen then appears. Hardware is configured, with the drivers working, the operating system installed and running, all without a single reboot.

Desktop/LX doesn't offer any choice of installed applications. An impressive number are available, though, including Mozilla (web browsing), Koffice (office suite) and Xmms (media player). These are laid out in the menus and work as expected; a point overlooked by many Linux distributors.

Lycoris has provided the KDE filemanager, Konqueror. Clicking on a text file launches a text editor, and other common 'Mime' types, including MP3s, MPGs and images, launch their applications. Also provided is a 'Network Neighbourhood' style browser for Windows shares.

Every option to make KDE more attractive is switched on by default. Many files are previewed in the file browser; menus fade in, and animations use up any spare processor cycles. All of these can be switched off through the Control Panel. The KDE Control Panel has been modified substantially, making many administrative tasks, such as adding a user or setting up a remote Windows printer, logical and straightforward.

As this system is aimed at the desktop user, many utilities found on other distributions are not present. Compatibility with Microsoft Office is relatively good, and Koffice's word processor and spreadsheet will open simple Word and Excel documents and display them adequately. If Microsoft Office compatibility is paramount, though, you should look towards Sun Microsystems' Star Office, which claims 100 per cent compatibility.

Barry Shilliday

DETAILS

PRICE \$29.95 (\$25.49 ex VAT) (approx £20) for official standard version (includes 60 days' email support), free downloadable version

CONTACT www.lycoris.com
www.linuxfactory.ie

SYSTEM REQUIREMENTS

Required: Pentium processor, 64MB of Ram, 1GB of hard disk space

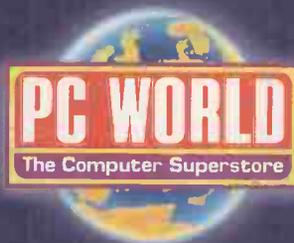
Recommended: 300MHz Pentium II, 128MB of Ram

PROS User friendly; easy to install

CONS Comparatively few applications; still a very young distribution

OVERALL Desktop/LX gives you cutting-edge applications with some unique features, and is great if you're new to Linux. A lot of time has been spent making the system as user-friendly as possible, but experienced Unix users will notice the missing common utilities

SCORE ■■■■■



STAMPING DOWN ON INTERNET PRICES

THE RIGHT COMPONENT, RIGHT NOW AT OUR IN-STORE COMPONENT CENTRES NATIONWIDE

Looking for OEM product rather than retail?
Need that Component right now, but only want to pay internet prices?
Then visit your local PC World store and check out the Component Centre range.

"TOP DEALS THIS MONTH"

SPARKLE 32Mb GRAPHICS CARD
Riva TNT2 M64 AGP.
Was £39.99.
SAVE £5 (534662).

PC WORLD PRICE ONLY
£34.99 INC VAT
£29.78 EX VAT



LG DVD ROM
16x Int ATAPI.
Model DRD8160.
Was £57.99.
SAVE £8 (488248).

PC WORLD PRICE ONLY
£49.99 INC VAT
£42.54 EX VAT



ASUS MOTHERBOARD
Model ASA7V266EA.
(593336).

PC WORLD PRICE ONLY
£149.99 INC VAT
£127.65 EX VAT



Image for illustration purposes only

EPOX MOTHERBOARD
Model EX3V5A.
(522071).

PC WORLD PRICE ONLY
£69.99 INC VAT
£59.67 EX VAT



Image for illustration purposes only

JEANTECH MIDI SYSTEM CASE
(Blue) incl. 300W PSU.
Model JN424.
(497523).

PC WORLD PRICE ONLY
£49.99 INC VAT
£42.54 EX VAT



MAXTOR OEM HARD DRIVE
40Gb, 7200rpm.
Model 6L040J2.
(519046).

PC WORLD PRICE ONLY
£74.99 INC VAT
£63.82 EX VAT



PSU 400W ATX.
Model 400W ATX.
Was £39.99.
SAVE £5 (529740).

PC WORLD PRICE ONLY
£34.99 INC VAT
£29.78 EX VAT



Image for illustration purposes only

ALLIED TELESYN 10/100 NIC CARD
Model AT2500TX - ACP.
Was £12.99.
SAVE £3 (389283).

PC WORLD PRICE ONLY
£9.99 INC VAT
£8.50 EX VAT

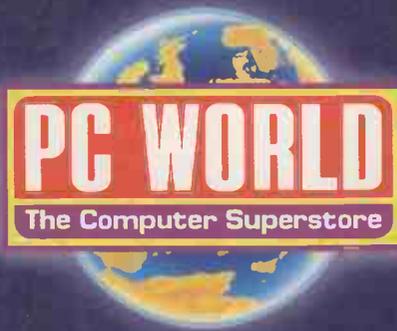


INSTANTLY AVAILABLE
in PC World stores.

Check on-line or phone 08705 464 464
for your nearest store.

ORDER DIRECT ON FREE PHONE
0800 0565732.

BUY ON-LINE AT
pcworld.co.uk.



THE AMD SOLUTION



AMD PROCESSORS

PART CODE		INC. VAT	EX. VAT
543781	Duron 1.1GHz	£54.99	£46.80
469263	Duron 1.1GHz Retail*	£72.97	£62.10
543800	Duron 1.2GHz	£56.99	£48.50
543819	Duron 1.3GHz	£76.99	£65.52
305068	Athlon 1.3GHz 200MHz*	£109.97	£93.59
543843	Athlon XP1800+*	£112.99	£96.16
469239	Athlon XP1800+ Retail*	£129.98	£110.62
543851	Athlon XP1900+	£161.99	£137.87
493439	Athlon XP1900+ Retail*	£157.99	£134.46
543886	Athlon XP2000+	£209.99	£178.71
593067	Athlon XP2100+	£259.99	£221.27



ATHLON
XP2100+.
(593067).

PC WORLD PRICE
£259.99 INC VAT
£221.27 EX VAT

SOCKET A MOTHERBOARDS



EPOX
Model EX8K3A.
(593352).

Image for illustration purposes only

PC WORLD PRICE
£104.99 INC VAT
£89.35 EX VAT



EPOX
Model EX8K3A+.
(593344).

Image for illustration purposes only

PC WORLD PRICE
£119.99 INC VAT
£102.12 EX VAT



ASUS
Model A7A266A.
(567091).

Image for illustration purposes only

PC WORLD PRICE
£114.99 INC VAT
£97.86 EX VAT



ASUS
Model ASA7V266EA.
(593336).

Image for illustration purposes only

PC WORLD PRICE
£149.99 INC VAT
£127.65 EX VAT

PART CODE		INC. VAT	EX. VAT
519089	ASUS AS-A7N266/EAL	£169.99	£144.67

*These products are only available on-line at pcworld.co.uk, link to PC Components.
Please check in-store or on-line for the latest information on products and prices.
Prices correct as at 21/05/02.

BUY ON-LINE AT

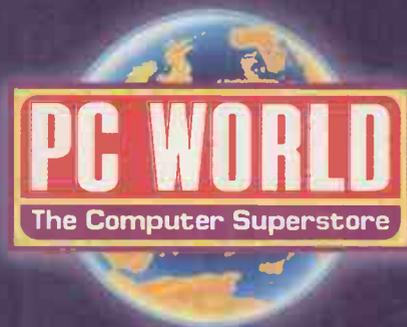
ORDER DIRECT ON FREE PHONE

pcworld.co.uk

0800 0565732



THE INTEL[®] SOLUTION



INTEL[®] PROCESSORS

PART CODE		INC. VAT	EX. VAT
Socket 370			
528902	Intel [®] Celeron™ 1GHz	£69.99	£59.57
528937	Intel [®] Celeron™ 1.2GHz	£81.99	£69.78
Socket 478			
530804	Pentium [®] 4 1.7GHz	£164.99	£140.42
529845	Pentium [®] 4 1.8GHz	£195.99	£166.80
528859	Pentium [®] 4 2.0GHz	£291.99	£248.50
571748	Pentium [®] 4 2.2GHz	£399.99	£340.42



PENTIUM[®] 4 2.2GHz
(571748).
Image for illustration purposes only

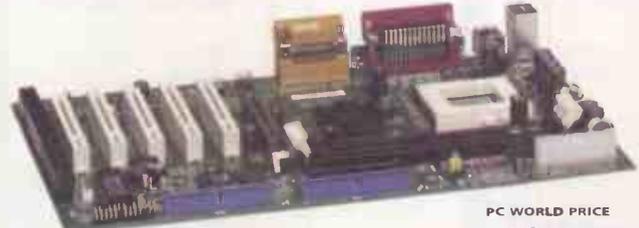
PC WORLD PRICE
~~£399.99~~ INC VAT
£340.42 EX VAT

INTEL[®] COMPATIBLE MOTHERBOARDS



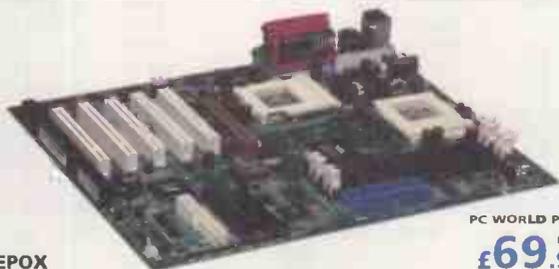
ASUS
Model ASP4B/A.
(430982).
Image for illustration purposes only

PC WORLD PRICE
~~£154.99~~ INC VAT
£131.91 EX VAT



EPOX
Model EX4B2A.
(519124).
Image for illustration purposes only

PC WORLD PRICE
~~£124.99~~ INC VAT
£106.37 EX VAT



EPOX
Model EX/3VSA.
(522071).
Image for illustration purposes only

PC WORLD PRICE
~~£69.99~~ INC VAT
£59.57 EX VAT



ASUS
Model P4B266A.
(585999).
Image for illustration purposes only

PC WORLD PRICE
~~£159.99~~ INC VAT
£131.16 EX VAT

Due to the nature of OEM Components, the range and prices shown here are subject to change at short notice. Please check in-store, on-line or phone 0800 0565732 for the latest range and price information. The information shown was correct as at the 21/05/02.

Please check in-store or on-line for latest prices and product updates.

INSTANTLY AVAILABLE IN PC WORLD STORES.
 Check on-line or phone 08705 464 464 for your nearest store.

PC WORLD

The Computer Superstore

FLOPPY DRIVE

COMPONENT CENTRE FLOPPY DRIVE (572734).

PC WORLD PRICE
INC VAT
£9.99
EX VAT
£8.50



CD-ROM DRIVE

SAMSUNG CD-ROM DRIVE 52x ATAPI. (280385).

PC WORLD PRICE
INC VAT
£24.99
EX VAT
£21.27



SOUND CARD

COMPONENT CENTRE SOUND CARD Model Muselight. (380282).

PC WORLD PRICE
INC VAT
£14.99
EX VAT
£12.76



CD-RW

PHILIPS CD-RW 24x. (583118).

PC WORLD PRICE
INC VAT
£74.99
EX VAT
£63.82



HARD DRIVES

PART CODE		INC. VAT	EX. VAT
	5400rpm 3.5" IDE		
280791	Samsung 20Gb*	£62.98	£53.60
280958	Samsung 40Gb*	£69.98	£59.56
514417	Maxtor 20Gb	£57.99	£49.35
519003	Maxtor 40Gb	£66.99	£59.57
518993	Maxtor 60Gb	£82.99	£70.63

ACCESSORIES

PART CODE		INC. VAT	EX. VAT
534592	Mouse 5-pack	£14.99	£12.76
534603	Keyboard 5-pack	£27.99	£23.82
	Cables		
539458	Floppy Drive Cable*	£2.99	£2.54
538999	SCSI I/II Dual Cable*	£19.99	£17.01
539017	SCSI III Single Cable*	£24.99	£21.27
539025	IDE Fast Cable*	£14.99	£12.76
539068	Round IDE Cable*	£14.99	£12.76
539103	Internal Power Cable*	£0.55	£0.47
539466	Internal Sound Cable*	£5.99	£5.10
	Kits and Bits		
539146	3 Way Ratchet Set*	£7.99	£6.80
539138	3 Piece Plier Set*	£6.99	£5.95
539415	Anti-static Mat*	£29.99	£25.52
539407	Earthing Plug*	£3.99	£3.40
539170	Heatsink Compound*	£3.49	£2.97
539208	Premium Compound*	£5.99	£5.10
539606	Acoustic Matting*	£29.99	£25.52
541653	Asst Screw Pack*	£7.99	£6.80

MEMORY

PART CODE		INC. VAT	EX. VAT
	SD-RAM		
354718	64Mb PC100		
354726	128Mb PC100		
354734	256Mb PC100		
354742	64Mb PC133		
354750	128Mb PC133		

Memory prices subject to change to reflect market price movements - check in-store, on-line or by phone for our latest prices

GRAPHICS CARDS

PART CODE		INC. VAT	EX. VAT
534646	Sparkle 16Mb	£29.99	£25.52
534662	Sparkle 32Mb	£39.99	£34.03

SYSTEM CASES

PART CODE		INC. VAT	EX. VAT
281234	Jeantech 300W D/top	£45.99	£39.14
281199	Jeantech 300W Mini	£45.99	£39.14

POWER SUPPLIES

PART CODE		INC. VAT	EX. VAT
28137	300W ATX	£29.99	£25.52
543714	350W ATX	£34.99	£29.78

FANS/COOLERS

PART CODE		INC. VAT	EX. VAT
283588	850MHz Fan*	£5.99	£5.10
283596	1200MHz Fan	£6.99	£5.95

THE MAJORITY OF THESE PRODUCTS ARE OEM VERSION AND DO NOT CONTAIN MANUALS, SOFTWARE OR CABLES. NOT ALL PRODUCTS ARE AVAILABLE IN ALL STORES. PLEASE CHECK YOUR LOCAL STORE FOR DETAILS.

*These products are only available on-line at pcworld.co.uk, link to PC Components. Please check in-store or on-line for the latest information on products and prices. Prices correct as at 21/05/02.

▼ Prices exclude delivery charge of £3.25. Goods normally dispatched within 3 working days. For further details of terms and conditions please refer to our website and refer to the Terms and Conditions section within customer service. The prices stated exclude the Republic of Ireland.

BUY ON-LINE AT

pcworld.co.uk

ORDER DIRECT ON FREE PHONE

0800 0565732

FOR YOUR NEAREST PC WORLD STOCKIST PHONE

08705 464464

Pick up a FREE CD in-store to join
freearrive
www.freearrive.com



BEST BUYS

YOUR GUIDE TO TODAY'S TOP PRODUCTS >>>>

Mesh **Matrix XP1800+SB**

REVIEW July 2002, p52 **PRICE** £821.83
(£699 ex VAT) **CONTACT** Mesh 020 8208 4744
www.meshcomputers.com

new



One of the best value systems we have seen in months, the Matrix 1800+ is powered by AMD's super-fast Athlon XP 1800+ and, with 256MB of PC2100 DDR SD-Ram, it's up there with the best of them in terms of performance.

Graphics are excellent too, coming from a Geforce4 MX 440. There's plenty of room inside for expansion and it comes with a 17in NEC monitor.

ENTRY-LEVEL PC

Hi-Grade **Ultis P4 C17 PW07**

REVIEW July 2002, p46 **PRICE** £938.83
(£799 ex VAT) **CONTACT** Hi-Grade 020 8532 6111
www.higrade.com

new



Although it suffers from the curse of onboard sound, this P4-based 1.7GHz Celeron system is a cut above the rest. With decent benchmark scores and an upgraded architecture, the Celeron is the best budget processor money can buy.

ATI's Radeon 8500LE chip is an ideal option at this price point, as is LG's excellent 775FT monitor. The new Hi-Grade case is a feature-packed delight too.

MID-RANGE PC

Task IT **Predator 2.4**

REVIEW July 2002, p51 **PRICE** £1,761.33
(£1,499 ex VAT) **CONTACT** Task IT 01442 233 573
www.task-it.co.uk

new



This system may not be cheap, but it packs a tremendous punch. Inside is a 2.4GHz P4 processor, featuring the all-new 533MHz front-side bus, and a Geforce4 TI 4400 graphics card. Also included is a 60GB hard drive and a superb 19in LG CRT screen, as well as Windows XP Home and Lotus SmartSuite. If you can afford the Predator 2.4, you'll have one of the fastest machines on the market.

HIGH-END PC

Sony **PCG-GRX316MP**

REVIEW July 2002, p47 **PRICE** £2,002
(£1,704 ex VAT) **CONTACT** Sony 08705 424 424
www.vaio.sony-europe.com

new



This notebook is both feature-packed and stylish. Its whopping 16in UXGA screen could easily make you forget the fact that there's a 1.6GHz Mobile P4 processor inside this large yet slender desktop replacement. While excellent performance is always a bonus, what really impressed us here was the battery life; well over two hours far outdoes the Mobile P4 competition.

FULLY FEATURED NOTEBOOK

Sony **Valo PCG-SRX41P**

REVIEW June 2002, p41 **PRICE** £1,849
(£1,573.61 ex VAT) **CONTACT** Sony 0870 240 2408
www.vaio.sony-europe.com



Sony notebooks have always been commended for their style, and this latest ultra-portable is no exception. Literally the best compact notebook we've seen, it maintains many of the Vaio design features that have made the range so successful, and includes both wireless and Bluetooth technologies. The icing on the cake is the battery life – a stunning three hours and 34 minutes.

ULTRA-PORTABLE NOTEBOOK

Toshiba **Satellite 3000**

REVIEW July 2002, p108 **PRICE** £999
(£850 ex VAT) **CONTACT** Toshiba 01932 828 828
www.toshiba.co.uk

new



Seldom do budget notebooks come as fully featured as this at a cost of less than £1,000. Performance is surprisingly good considering its meagre asking price, and battery life is up there with the best of them. The Satellite is also the only notebook in its class capable of completing our graphics tests. While there are areas where costs have been cut, such as the lack of ports at the rear, the rest is near perfect.

BUDGET NOTEBOOK

BEST BUYS YOUR GUIDE TO TODAY'S TOP PRODUCTS

Sony Clie PCEG-T625

REVIEW June 2002, p42 **PRICE** £329
 (£280 ex VAT) **CONTACT** Sony 0990 111 999
www.sony.com



Stylish and functional, this latest Clie is more than just a pretty face. While its use of Palm OS means it has fewer features than its Pocket PC-based rivals, its build quality is exceptional.

POCKET PC

Philips Webcam Pro 3D

REVIEW March 2002, p139 **PRICE** £76.99
 (£65.52 ex VAT) **CONTACT** Philips 0800 169 8430
www.philips.co.uk



This is a brilliant webcam that can be used for high-res still snaps or 60fps video at 640 x 480. It is even capable of text recognition with the help of Xerox's Pagecam technology.

WEBCAM

Hewlett-Packard PSC 950

REVIEW June 2002, p56 **PRICE** £299
 (£254.47 ex VAT) **CONTACT** HP 08705 474 747
www.hp.com



The PSC 950 may be more expensive than some, but it squeezes ahead of the competition with superb-quality printing and scanning, and the added bonus of three memory card slots.

MULTI-FUNCTION DEVICE

Canon D1250U2

REVIEW April 2002, p75 **PRICE** £119
 (£101.28 ex VAT) **CONTACT** Canon 0121 680 8062
www.canon.co.uk



This first USB2 scanner is also one of the best. Lightning fast and excellent quality, and with plenty of extra features as standard, the only thing that could turn you off is the price.

SCANNER

Minolta Pagepro 1100L

REVIEW May 2002, p122 **PRICE** £131
 (£111.49 ex VAT) **CONTACT** Minolta 01784 442 255
www.minolta-qms.co.uk



The Pagepro 1100L may not be pretty, or the best quality, but at the asking price, what you get is truly astounding. Easy to use and compact, this is the best value laser printer on the market.

BUDGET LASER PRINTER

Epson Stylus Photo 895

REVIEW November 2001, p216 **PRICE** £155.99
 (£132.76 ex VAT) **CONTACT** Jungle 0870 727 1771
www.jungle.com



Featuring a PC Card slot, an attachment for 100 x 8m rolls of photo paper, a top resolution of 2,880 x 720dpi and PIM technology, this is a versatile printer at an excellent price.

BUDGET INKJET PRINTER

Creative Inspire 5300

REVIEW April 2002, p132 **PRICE** £88.71
 (£75.50 ex VAT) **CONTACT** Creative 0800 973 069
www.europe.creative.com



A decent set of 5.1 speakers boasting excellent sound quality at a reasonable price. They're a bit basic and lack a separate decoder, but if you own a 5.1 sound card these are ideal speakers.

LOW-END SPEAKERS

Acoustic Energy Aego2

REVIEW April 2002, p138 **PRICE** £299.95
 (£255.28 ex VAT) **CONTACT** Acoustic Energy
www.aegoproject.com



Dressed in stylish plastic, the Aego2s are the best looking 2.1 speakers we've seen. Sound quality is almost infallible too, but a setup of this quality comes with a hefty price tag.

HIGH-END SPEAKERS

Creative Audigy Platinum EX

REVIEW December 2001, p95 **PRICE** £157.45
 (£134 ex VAT) **CONTACT** Watford 0870 220 0700
www.europe.creative.com



Aimed at musicians, gamers and DVD fans the Audigy has 24bit, 96KHz-capable Dacs and handles audio streams in 16bit at 48KHz. Software connects two PCs via Firewire.

SOUND CARD

Ericsson T68

REVIEW April 2002, p66 **PRICE** £149.99
 (£127.65 ex VAT) **CONTACT** Ericsson 0990 237 237
www.sonyericssonmobile.com/uk



One of the first colour mobile phones that comes in an incredibly compact size. It's loaded with all the latest features such as GPRS, HSCD, Bluetooth and Tri-band, making it an excellent mobile phone.

MOBILE PHONE

IBM Deskstar 120GXP

REVIEW April 2002, p69 **PRICE** £238.52
 (£203 ex VAT) **CONTACT** Dabs 0870 429 3120
www.dabs.com



The performance of the new range of Deskstar drives from IBM surpasses every EIDE drive we've previously seen. If you're after a large and fast hard drive, which makes very little noise, then look no further.

EIDE HARD DRIVE

Fujitsu MAN3735MP

REVIEW February 2002, p152 **PRICE** £602.77
 (£513 ex VAT) **CONTACT** Fujitsu 020 88573 4444
www.fujitsu-europe.com



One of the fastest SCSI hard drives on the market that offers 73.5GB of storage space and a spindle speed of 10,000rpm. An excellent choice for high-end workstations and servers, but it comes at a cost.

SCSI HARD DRIVE

Abit KG7-Raid

REVIEW December 2001, p190 **PRICE** £113.98
 (£97 ex VAT) **CONTACT** Dabs 0870 429 3120
www.dabs.com



SOCKET A MOTHERBOARD

One of the first DDR boards to support four memory slots. It is based on the AMD 761 northbridge and the Via 686B southbridge and contains six PCI slots. The ultimate AMD board for enthusiasts.

Abit TH7II-Raid

REVIEW December 2001, p180 **PRICE** £164.50
 (£140 ex VAT) **CONTACT** Dabs 0870 429 3120
www.dabs.com



P4 MOTHERBOARD

With an Intel 850 chipset and RD-Ram support, this is a fast board. The micro-LEDs, onboard alphanumeric LCD for diagnostics and micro-buttons for power and reset make configuration easy.

Samsung SM151B

REVIEW February 2002, p69 **PRICE** £370.12
 (£315 ex VAT) **CONTACT** Samsung 0800 521 652
www.samsungelectronics.co.uk



This high-quality 15In flat panel features integrated speakers and comes with pivot software as standard. Boasting excellent image and text quality, the SM151B is well worth its price.

LCD MONITOR

NEC-Mitsubishi Diamond Pro 740SB

REVIEW April 2002, p56 **PRICE** £210.32 (£179 ex VAT)
CONTACT NEC-Mitsubishi 08701 201 160
www.nec-mitsubishi.com



An attractively priced 17in Diamondtron monitor featuring Superbright, which improves the brightness during game play and DVD playback without decreasing the image quality.

17IN MONITOR

Iiyama Vision Master Pro 453

REVIEW October 2001, p167 **PRICE** £440.63
 (£375 ex VAT) **CONTACT** Iiyama 01438 314 417
www.iiyama.co.uk



The first CRT in the UK to feature a DVI connection, the Vision Master Pro 453 offers excellent colour purity. It also boasts a four-port USB hub, speakers and has a grey finish.

19IN MONITOR

Mitsubishi Diamond Pro 2060U

REVIEW October 2001, p80 **PRICE** £652.12 (£555 ex VAT)
CONTACT Mitsubishi 08701 201 160
www.mitsubishi-monitors.com



Fitted with two standard D-Sub connectors and three downstream USB ports, this 21in monitor is capable of running a resolution of 2,048 x 1,536, though 1,600 x 1,200 is best.

21IN MONITOR

Sony DCR-PC110E

REVIEW June 2001, p107 **PRICE** £1,126.82
 (£959 ex VAT) **CONTACT** Sony 0990 111 999
www.sony.co.uk



The DCR-PC110E is a small, solid camera, with a 4MB Memory Stick and a top resolution of 1,152 x 864. A dual-function button enables you to switch between manual and auto-focus mode.

DIGITAL VIDEO CAMERA

MSI G4MX440-T

REVIEW April 2002, p60 **PRICE** £92.82
 (£79 ex VAT) **CONTACT** Scan 0870 755 4747
www.msi.com.tw



Based on Nvidia's new Geforce4 MX440 chipset, this card has 64MB of fast DDR memory, running at 550MHz. Also featuring an S-Video TV-out, it easily outperforms the competition.

GRAPHICS CARD

ATI All-in-Wonder Radeon 8500

REVIEW March 2002, p69 **PRICE** £316.08
 (£269 ex VAT) **CONTACT** ATI 01628 480 200
www.ati.com



When it comes to performance and features, this superb, if pricey, graphics card keeps ATI ahead of the pack. Truly universal, it's ideal for gamers, video editing and TV/DVD playback.

VIDEO-EDITING CARD

Olympus C4040 Zoom

REVIEW January 2002, p172 **PRICE** £675.02
 (£575.50 ex VAT) **CONTACT** Olympus 0800 072 0070
www.olympus.co.uk



If a 3megapixel camera is just not enough for you, the C4040 is the one to buy. Featuring a 4.13megapixel CCD, 3x optical zoom, and a 64MB Smartmedia card, it's sturdy, light and very comfortable to use.

DIGITAL CAMERA

Panasonic LF-D311

REVIEW November 2001, p103 **PRICE** £468.82
 (£399 ex VAT) **CONTACT** Panasonic Industrial
 0845 600 3535 www.panasonic-industrial.com



With an EIDE interface and the ability to burn DVD-R discs, this Panasonic drive is a tantalising device. It's also bundled with Sonic DVD It software, Prassi Primo DVD, Cyberlink's Power DVD and Power VCR II.

REMOVABLE STORAGE

LG GCE-8320B

REVIEW April 2002, p71 **PRICE** £82.25 (£70 ex VAT)
CONTACT LG Electronics 0870 607 5544
www.lge.co.uk



If you're after a fast drive at an amazing price you can't go wrong with this LG. It's one of the fastest CD writers we've tested to date, and with both buffer underrun protection and an 8MB buffer it's a great buy.

CD-RW

MOBILE COMPUTING STARTS HERE

DELL™ SMARTPC™ 100N c1.06GHz GT

- MOBILE INTEL® CELERON® PROCESSOR 1.06GHz
- 14.1" XGA TFT (1024 X 768) Screen
- 128MB 100MHz SDRAM • 20GB EIDE Hard Drive
- 24X Max CD-ROM
- Intel Integrated 3D AGP graphics with up to 32MB shared system memory
- 3D Positional Sound with Wavetable • Integrated Touchpad
- Integrated 56kps V90 Modem • NEW Microsoft® Windows® XP
- Microsoft® Works 6.0 • 90 Day Limited Warranty
- 90 Day Euro Collect and Return Service¹

£749 EXC. DEL & VAT

£937.65 INC. DEL & VAT

£33.96 PM* (INC. DEL & VAT)

*36 MTH TECHNOLOGY BUSINESS PLAN



E-VALUE: 004 i0106

COMPUTING ON THE MOVE

DELL INSPIRON 2650 1.6GHz GT

- MOBILE INTEL® PENTIUM® 4 PROCESSOR 1.6GHz - M FEATURING INTEL® SPEEDSTEP™ TECHNOLOGY (Now Includes Free Processor Upgrade Was 1.4GHz Now 1.6GHz & £100 off)
- 14.1" XGA TFT (1024 X 768) Screen • 128MB 266MHz DDR Memory
- 20GB Removable EIDE Hard Drive
- Integrated 10/24x Max CD ROM & Floppy Drive
- nVidia Geforce2 Go 100 with 8MB Video Memory
- 3D Positional Sound with Wavetable • Integrated Touchpad
- Integrated 56kps V90 Modem • NEW Microsoft® Windows® XP
- Microsoft® Works 6.0 • 1 Year Euro Collect and Return Service¹

£899 EXC. DEL & VAT

£1,113.90 INC. DEL & VAT

£40.35 PM* (INC. DEL & VAT)

*36 MTH TECHNOLOGY BUSINESS PLAN

FREE PROCESSOR UPGRADE AND £100 OFF EX. VAT



E-VALUE: 004 i0306



Your business is wherever you are. With the active assistance of a Dell Inspiron notebook. Sleek, powerful and reliable, a Dell Inspiron is custom built to your needs. With platforms ranging from the Intel Celeron Processor to the latest, high performing Mobile Intel Pentium 4 Processor. Call Dell – and enjoy the freedom of the world.

DELL PCs USE GENUINE MICROSOFT® WINDOWS®
www.microsoft.com/piracy/howtotell

CompleteCare™ Accidental damage cover for Dell notebooks. 3 years cover + 3 year service support – for £279 EX. VAT. Phone and ask for details.



Prices and specifications are correct at date of publication but subject to availability or change without notice. Delivery charge is £69 (£57.58 inc VAT) per system. ^V.I.S. means viewable inscreen, this is measured from top left to bottom right-hand corner of screen. Response times may vary according to the remoteness accessibility of product location. Service may be provided via telephone or internet where appropriate. Certain restrictions apply. Dell's Terms and Conditions of Sales and Service apply and are available on request and at www.dell.co.uk Business customers only. ©2002 Dell Computer Corporation. Dell, the Dell logo, CompleteCare, Inspiron and SmartPC are registered trademarks or trademarks of Dell Computer Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron and SpeedStep are trademarks of Intel Corporation. Microsoft and Windows are registered trademarks of the Microsoft Corporation. Other trademarks or trade names may be used in this document to refer to either the entities claiming the marks and names of their products. Dell disclaims proprietary interest in the marks and names of others. Dell Products c/o Box 69, Milbanke House, Western Road, Bracknell, Berks, RG12 1RD.
¹Finance is available from Dell Financial Services which is a trading style of Tyco Capital (UK) Limited, an affiliate of Tyco Capital Corporation. Registered Office, Ringside House, 79 High Street, Bracknell, Berkshire, RG12 1DZ. Correspondence address is Dell Financial Services, Western Road, Bracknell, Berkshire RG12 1RD. Finance will be subject to status and is for U.K. business customers only. Payments are based on a Technology Business Plan lease agreement with 36 monthly payments by direct debit and include delivery charges and VAT. Prices are correct at time of going to press & are subject to change during term of this offer without notice. Dell Financial Services' terms & conditions & up to date written quotations are available upon request.

DELL INSPIRON. BECAUSE THE WORLD'S YOUR WORKPLACE.

PRODUCT SHOWN: INSPIRON 8200

LIGHT AND POWERFUL

DELL INSPIRON 4100 e1.06GHz GT

- MOBILE INTEL CELERON PROCESSOR 1.06GHz
- 14.1" XGA TFT (1024 X 768) Screen
- 128MB 133MHz SDRAM • 20GB Removable EIDE Hard Drive
- 2/6x Max DVD-ROM
- High Performance ATI Rage 3D Graphics with 16MB Video Memory
- Harmon Kardon Audio • IEEE 1394 Firewire port
- Integrated Touchpad and Trackstick
- Integrated 56kps V90 Modem - 10/100 Ethernet
- NEW Microsoft® Windows® XP • Microsoft® Works 6.0
- 1 Year Euro Collect and Return Service¹

£1,099 EXC. DEL & VAT

£1,348.90 INC. DEL & VAT

£48.86 PM* (INC. DEL & VAT)

*36 MTH TECHNOLOGY BUSINESS PLAN

**INCLUDES BROWN
LEATHER SADDLE
BAG AND SPARE
MAIN BATTERY**

 E-VALUE: 004 i1106

THE MOBILE POWERHOUSE

DELL INSPIRON 8200 1.8GHz BT

- MOBILE INTEL PENTIUM 4 PROCESSOR 1.8GHz - M
FEATURING INTEL SPEEDSTEP TECHNOLOGY
- 15" Enhanced Ultra XGA TFT (1600X1200) Screen
(Now Includes Free Upgrade from UT to ASV)
- 256MB 266MHz DDR Memory • 40GB Removable EIDE Hard Drive
- Integrated DVD & CD-RW Combo drive
- GeForce4 Go 440 64MB • Harmon Kardon Audio
- Integrated Touchpad and Trackstick
- Integrated 56kps V90 Modem - 10/100 Ethernet
- NEW Microsoft® Windows® XP • Microsoft® Works 6.0
- 1 Year Euro Collect and Return Service¹

£1,799 EXC. DEL & VAT

£2,171.40 INC. DEL & VAT

£78.65 PM* (INC. DEL & VAT)

*36 MTH TECHNOLOGY BUSINESS PLAN

**FREE SCREEN
UPGRADE
AND £100 OFF EX. VAT**

 E-VALUE: 004 i1006



NEW INSPIRON 2650



INSPIRON 4100



INSPIRON 8200

CALL 0870 907 5684

BETWEEN 8AM AND 8PM WEEKDAYS, 10AM TO 4PM SATURDAY

CLICK www.dell.co.uk

ORDER ONLINE 24 HOURS A DAY GET SPECIAL DEALS ONLINE

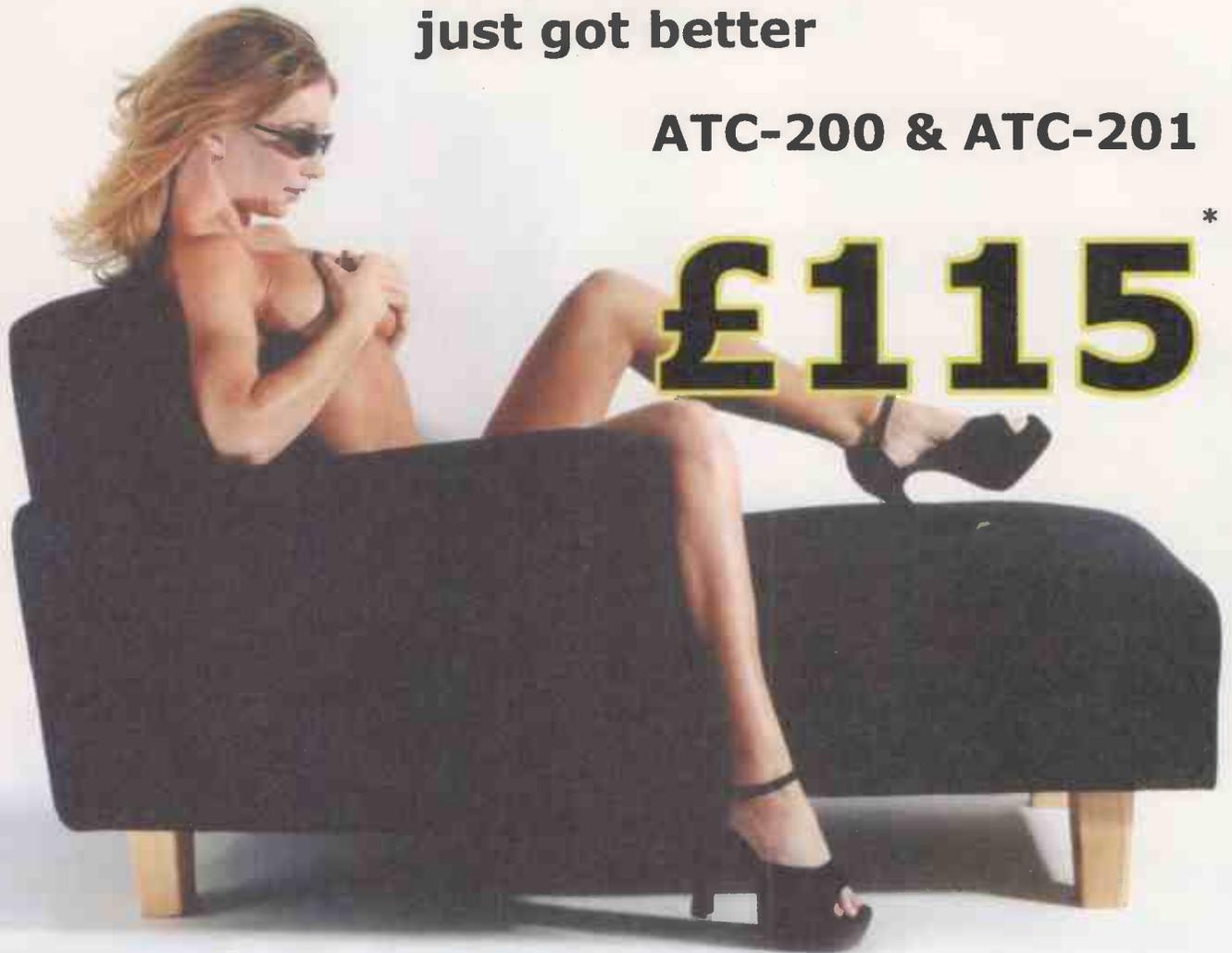


ATCSTM
Active Thermal Convection System

The most fabulous alloy case ever made, just got better

ATC-200 & ATC-201

£115*



The Ultimate Thermal Solution

Participating Retailers

- Scan International - www.scan.co.uk
 - Esnet - OcUK - www.overclockers.co.uk
 - EBuyer - www.ebuyer.com
 - Watford Electronics - www.watford.co.uk
 - Simply Computers - www.simply.co.uk
 - VGI Computers - www.vgicomputers.co.uk
 - SunAUM - www.sunaum.com
 - Nexnix - www.nexnix.co.uk
- Full list on the website below.



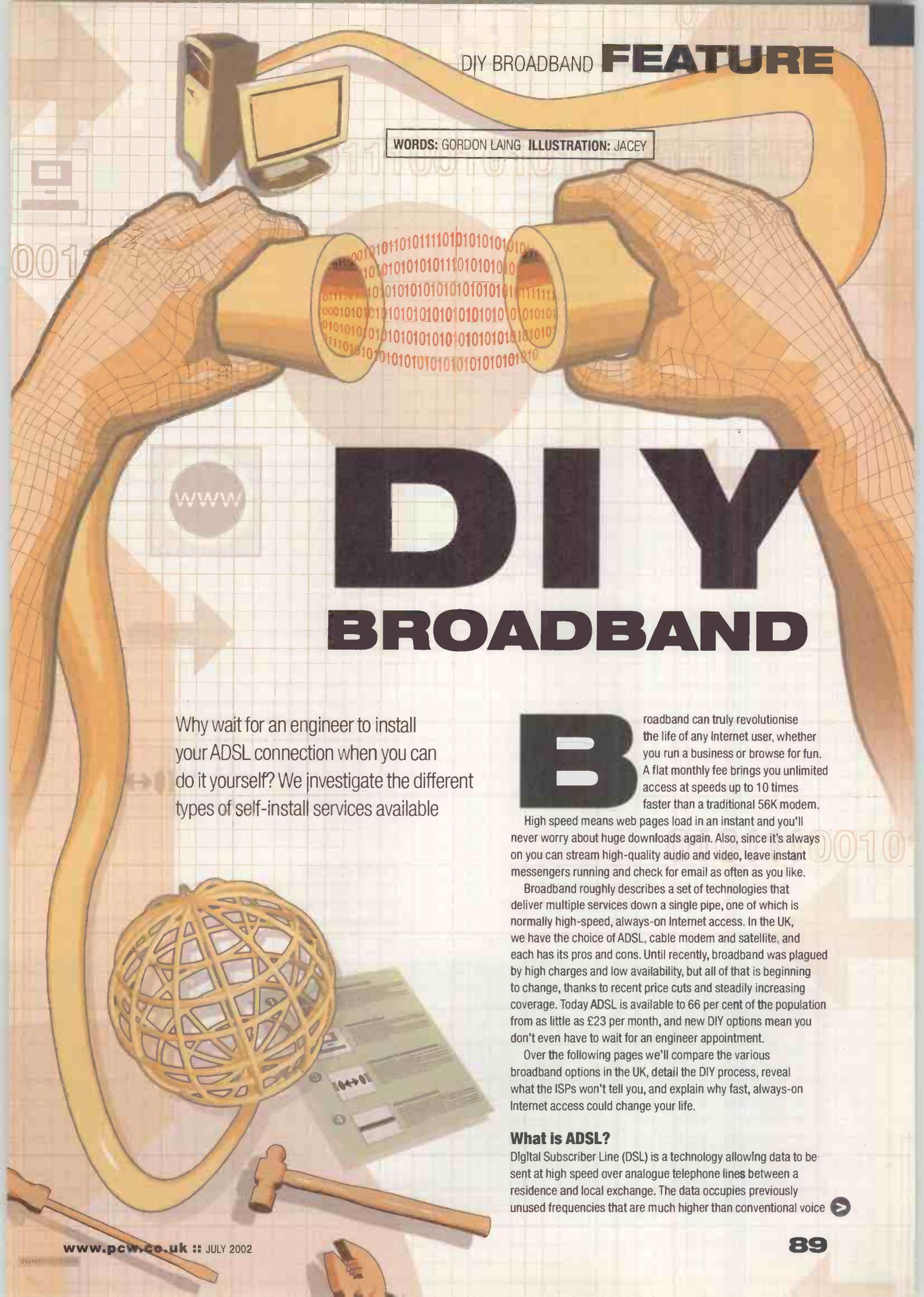
also at www.ukgamer.net

* Excludes VAT @ 17.5% and P&P

www.coolermaster.co.uk

PICTURES ARE FOR ILLUSTRATION PURPOSES ONLY AND IS NOT TO SCALE. WE RESERVE THE RIGHT TO CHANGE THE CONFIGURATION AT ANY TIME WITHOUT NOTICE. ALL LOGOS AND TRADEMARKS ARE REGISTERED TO THEIR RESPECTIVE OWNERS.

WORDS: GORDON LAING ILLUSTRATION: JACEY



DIY BROADBAND

Why wait for an engineer to install your ADSL connection when you can do it yourself? We investigate the different types of self-install services available

Broadband can truly revolutionise the life of any Internet user, whether you run a business or browse for fun. A flat monthly fee brings you unlimited access at speeds up to 10 times faster than a traditional 56K modem.

High speed means web pages load in an instant and you'll never worry about huge downloads again. Also, since it's always on you can stream high-quality audio and video, leave instant messengers running and check for email as often as you like.

Broadband roughly describes a set of technologies that deliver multiple services down a single pipe, one of which is normally high-speed, always-on Internet access. In the UK, we have the choice of ADSL, cable modem and satellite, and each has its pros and cons. Until recently, broadband was plagued by high charges and low availability, but all of that is beginning to change, thanks to recent price cuts and steadily increasing coverage. Today ADSL is available to 66 per cent of the population from as little as £23 per month, and new DIY options mean you don't even have to wait for an engineer appointment.

Over the following pages we'll compare the various broadband options in the UK, detail the DIY process, reveal what the ISPs won't tell you, and explain why fast, always-on Internet access could change your life.

What is ADSL?

Digital Subscriber Line (DSL) is a technology allowing data to be sent at high speed over analogue telephone lines between a residence and local exchange. The data occupies previously unused frequencies that are much higher than conventional voice

FEATURE DIY BROADBAND

traffic. This means you can use the same line for high-speed, always-on Internet access, while still chatting or faxing.

Since the vast majority of people download more data than they send, most telecom providers offer an asymmetric service, where incoming speeds are higher than outgoing ones – hence asymmetric DSL or ADSL. Symmetrical DSL services offer identical upload and download speeds, but are less commonly implemented.

In the UK the main players are BT and Kingston Communications, the latter offering ADSL to all its customers in Hull, under the name Karoo Rapidtime – see www.kcftd.co.uk for more information.

BT's wholesale division offers a number of ADSL packages that are sold onto ISPs which then repackage them for retail.

All have upload speeds of 250Kbits/sec, and download speeds of either 500, 1,000 or 2,000Kbits/sec.

ADSL is known as a contention service, which means you share the connection to your ISP with other subscribers. BT Wholesale operates two different contention ratios: 50:1 for the cheapest services and 20:1 for the expensive ones. A contention ratio of 50:1 means up to 49 other users could be sharing your bandwidth at any time. BT doesn't consider this a problem, though, as most people use their connections in short bursts to load new web pages, send emails or download files.

ADSL requirements

To get ADSL, you need a standard analogue BT telephone line that's within 5.5km of a local exchange, which has been upgraded for ADSL operation. By June 2002, BT will have upgraded over 1,000 local exchanges, which will bring the total ADSL coverage to two-thirds of the population. Right now it has 60 per cent coverage, but by upgrading another 100 or so exchanges, BT will reach another six per cent. To find out if ADSL is available on your line, enter your postcode and phone number into the broadband availability section of the BT Openworld website (www.btopenworld.co.uk). Potential subscribers to Freeserve's ADSL service can alternatively check their line in branches of Dixons.

Line activation takes up to 15 working days, after which you'll need an ADSL modem and a filter to separate the conventional voice traffic from high data frequencies. In the past, you had to rent the modem from your ISP and book an appointment with a BT engineer to fit the filter. The engineer installation is still available, but now you can alternatively choose a DIY option, buying your own modem and fitting the filter yourself. This process is quicker and cheaper, and you also have a choice of modem – more of which later.

ADSL prices

The cheapest ADSL packages deliver 500Kbits/sec download and 250Kbits/sec upload, with a contention ratio of 50:1. Larger ISPs, such as BT Openworld, Freeserve, Demon and Netscalibur, typically sell this for £29 or £30 per month, while smaller ISPs, such as Plusnet, offer it as low as £23.44 per month – all inclusive of VAT. While all resell the same BT Wholesale consumer package, each ISP may offer slightly different levels of service, performance, contract lengths and extras, so check the small print. The monthly rental is the same for DIY or engineer-install, and most ISPs offer either.

BT Wholesale recently announced a future ADSL package which connects users directly to the Internet, bypassing traditional ISP hardware. This could allow ISPs to offer ADSL services without an investment in server and routing hardware, although end-user prices are unlikely to be much cheaper than today's lowest subscriptions.

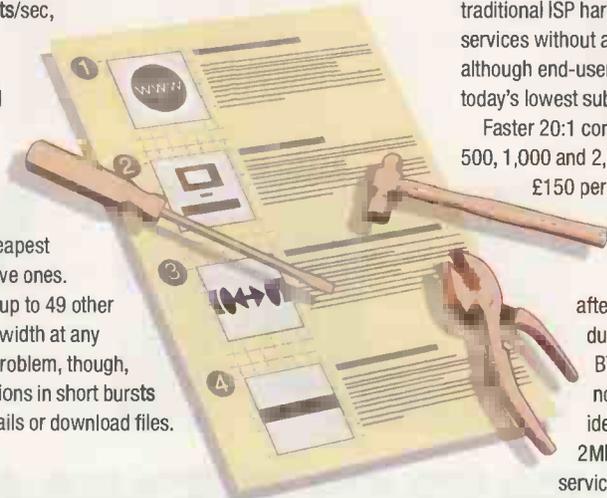
Faster 20:1 contention services offering download speeds of 500, 1,000 and 2,000Kbits/sec typically cost around £80, £120 and £150 per month, although you'll need to be located less than 3km from your exchange. These are also classed as business services and normally exclude VAT.

Easynet offers higher-speed ADSL services, after installing its own hardware in selected exchanges during the unbundling of BT's local loop. Along with BT Wholesale's standard ADSL packages, Easynet now also offers its own symmetrical services with identical upload and download speeds (up to 2Mbits/sec), and very high-speed asymmetrical services with 768Kbits/sec uploads and 4 or 8Mbits/sec downloads. The 2Mbits/sec symmetrical and 768/8,000Kbits/sec asymmetrical services both cost £250 per month, but you'll need to be near one of Easynet's unbundled exchanges and stump up a £995 installation fee, which puts this in the realm of the business user.

ADSL requires your line to be activated for a one-off fee. The engineer-install cost of £200 to £250 includes this activation fee and rental of a suitable modem for the contract period. The DIY option charges around £65 for activation, although ISPs sometimes waive or reduce this fee. DIY ADSL also requires that you buy your own modem and line filters. Most ISPs offer a DIY starter pack including modem and filters for £85, although there are other options. ADSL may offer unlimited Internet access for a flat fee, but you'll still need to pay for your normal phone calls and BT line rental.

Cable modem

Cable modem services offer high-speed, always-on Internet access through conventional cable TV lines. Like ADSL, most cable services are asymmetric, with higher download rates than upload. The two operators offering cable modem services in the UK are NTL and



BROADBAND PROVIDERS COMPARED

ISP	BT Openworld	BT Openworld	Freeserve	Pipex
Service	Home 500 Engineer assisted	Home 500 Plug & Go	Broadband	Xtreme Solo
Broadband technology	ADSL	ADSL	ADSL	ADSL
Max download/upload speed (Kbits/sec)	500/250	500/250	500/250	500/250
Installation/activation fee	£250	£65	£65	Free for first 40,000 subscribers
Monthly rental fee	£29.99 inc VAT	£29.99 inc VAT	£29.99 inc VAT	£23.44 inc VAT
Equipment included/DIY	✓/x	x/✓	x/✓	x/✓
Availability	66% of UK population	66% of UK population	66% of UK population	66% of UK population
Website	www.btopenworld.com	www.btopenworld.com	www.freeserve.com	www.pipex.net

Note: all quoted speeds are theoretical maximums. Bandwidth is shared between users and performance may decrease during busy times

Telewest, but a TV or telephone subscription with either does not necessarily mean broadband Internet access is offered in your area. As with ADSL you'll need to check availability on their respective websites, but the service is not limited by distance.

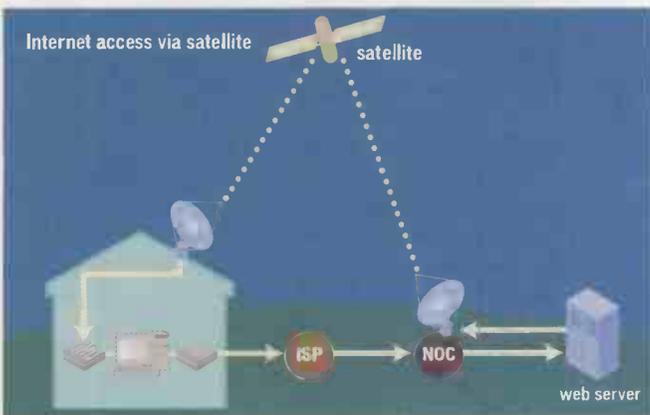
Cable modems also operate a contended service, although this could involve more people than ADSL. A single cable TV channel devoted to Internet data may deliver over 30Mbps/sec, but it's shared throughout an entire neighbourhood that could have up to 1,000 users. Even if you were the only one using the service, you wouldn't enjoy 30Mbps/sec, as the operators cap each user's maximum speed.

NTL offers three speeds with the following download and upload speeds: 128/64Kbits/sec, 512/128Kbits/sec and 1,024/256Kbits/sec. The cheapest 128/64Kbits/sec service costs either £24.98 per month including an NTL telephone subscription, or £42.98 per month including an NTL telephone and digital TV subscription. The 512/128Kbits/sec service costs either £34.98 or £52.98 per month with the same subscription conditions as above. Similarly, the 1,024/256Kbits/sec service weighs in at £59.98 or £77.98, depending on whether you take digital TV or the phone subscription. Installation fees are £50 for the cheapest and £75 for the faster options, and subscription includes rental of the cable modem from NTL.

Telewest's Blueyonder broadband service offers 512Kbits/sec download and 128Kbits/sec upload, and costs either £29.99 per month or £25 per month if you also subscribe to Telewest's digital TV and telephone services; both prices include rental of the cable modem. The installation fee is £50, or £25 if you also subscribe to the TV and phone services.

Satellite

The third type of broadband access is by satellite. More expensive services employ a single dish to send and receive high-speed data, while cheaper services use the dish for downloading only, and a conventional 56K landline modem for the uplink. It's worth noting



Satellite ADSL is not cheap, but is the only service available everywhere in the UK

IS YOUR PC READY FOR BROADBAND?

If you're looking to move into the broadband world, make sure your PC has, or can cope with, the following:

- Minimum specification: 200MHz Pentium, 32MB of memory, 150MB of free hard disk space
- USB ADSL modems require a free USB port and Windows 98 or later; incompatible with dual-CPU systems, which must use Ethernet modem instead
- Ethernet ADSL modems require a 10BaseT Ethernet port and an operating system that supports TCP/IP networking and DHCP – typically Windows 95 or later
- Most cable modems require a 10BaseT Ethernet port, but some feature USB ports too
- Satellite modems require either USB or 10BaseT Ethernet port – check with the supplier

that 56K modems only upload at 33Kbits/sec. The main players in this market are Aramiska, Bridge Broadband, Tiscali and BT. Bridge Broadband offers a two-way satellite service with 128Kbits/sec uploads and three download speeds of 512, 640 or 768Kbits/sec for £159, £199 and £249 per month respectively (installation fee included). BT Openworld offers a two-way business satellite service offering up to 500Kbits/sec download and 150Kbits/sec upload for £60 per month, and an £899 setup/equipment fee.

BT Wholesale recently announced a new satellite package using a dish to download data at 256Kbits/sec and a landline modem for uploads; higher 4Mbps/sec download speeds would be available on a pay-per-use basis. BT Wholesale intends to sell this service to ISPs including BT Openworld for around £15 per month (same as basic ADSL), but with a £400 installation fee – check this month's News pages for end-user pricing and news of a rival satellite service.

Satellite is unlikely to offer the cheapest prices, especially for high-speed two-way communications, but it is the only broadband service available everywhere in the UK. Perfect whether you're just beyond the reach of cable and ADSL, or located in rural areas.

DIY ADSL

From mid-January, BT Wholesale finally offered a self-install ADSL option, which eliminates the cost of an engineer appointment, not to mention the wait. Self-install ADSL has been available in Germany for over two years, but BT Wholesale claims the delay was finding suitable filters for its network that the public can fit themselves.

Self-install in the UK typically costs £65 for line activation, plus around £85 for an ADSL modem and the required micro-filters. The monthly rental price is now the same as an engineer-install, so the only real difference is an initial saving of around £50 and the chance

Easynet	NTL	Telewest	BT Openworld	Bridge Broadband
Business Broadband LLU	NTL: Home broadband	Blueyonder	Business Satellite 500/1	Bronze
ADSL	Cable modem	Cable modem	Satellite	Satellite
8,000/750	128/64	512/128	500/150	512/128
£995	£50	£50 or £25 for Telewest subscribers	£899	Free
£250 ex VAT	£24.98 with NTL phone or £42.98 with NTL phone and TV (inc VAT)	£29.99 or £25 for existing Telewest subscribers inc VAT	£59.99 ex VAT	£159 ex VAT
✓/x	✓/x	✓/x	✓/x	✓/x
Must be near one of Easynet's unbundled exchanges	In selected NTL areas	In selected Telewest areas	Anywhere in UK	Anywhere in UK
www.uk.easynet.net	www.ntlworld.com	www.blueyonder.co.uk	www.btopenworld.com	www.bridgebroadband.co.uk

FEATURE DIY BROADBAND

to be up and running sooner. More importantly, though, it also lets you choose your own ADSL modem, which we'll come to in a moment.

The DIY installation process is a doddle. The key is the micro-filter, which looks just like a conventional line splitter. Connect your normal telephone and the ADSL modem to their respective sockets on the filter, then plug it into your wall socket. You then need to install any modem software before connecting it to your PC. Since a line activated for self-install ADSL will have high data frequencies coming out of every phone socket in your home, you'll need to fit a micro-filter onto all of them; BT says this includes non-voice devices like fax machines or set-top boxes. Most self-install ADSL kits come with two micro-filters, but if you've bought your modem independently, or require additional ones, they cost around £12 each.

Clearly DIY has proved to be a big hit, as already 75 to 80 per cent of all new ADSL connections are self-install, and BT Wholesale sees no reason for it not to settle at the same 90 per cent mark as in Germany. Self-install ADSL is only available on the cheapest 500Kbits/sec packages – the faster 1 and 2Mbits services still require an engineer appointment and normally also include rental of a more appropriate Ethernet-based modem or router.

ADSL modems

The vast majority of ISPs delivering self-install ADSL also offer a broadband starter kit, including the standard Alcatel USB modem and a pair of micro-filters for around £70 ex VAT. Indeed, while many encourage the adoption of this Alcatel 'Stingray', you're normally free to choose any ADSL modem.

Many users prefer Ethernet modems which don't require drivers and work with any OS that supports TCP/IP networking – models with built-in router facilities start at around £100 ex VAT, and basic 10/100 Ethernet PCI cards can cost as little as £10. But if you're after the cheapest solution, check out internal PCI ADSL modems. Dabs' own model costs just £44 ex VAT, but remember if you buy your own modem, you also need your own micro filters at around £12 each (see www.btopenworld.dslshop.co.uk).

The Alcatel 'Stingray' (right) is frequently offered in broadband starter kits



To work with BT's ADSL network, you'll need a modem that offers PPP (point-to-point protocol) over ATM (asynchronous transfer mode), also known as PPPoA. If you buy your own Ethernet modem or router, you'll also need to configure its Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) settings to 0 and 38 respectively. Existing ADSL users can also technically swap their modem, although they're unlikely to be supported by their ISP. If your installation was performed by an engineer, you won't need any micro-filters.

Sharing broadband

Broadband suppliers clearly state their cheapest services are designed to connect one PC only. More expensive versions are available for those who want to connect multiple PCs. The reality, though, is that any Internet connection, broadband or otherwise can be shared between multiple devices. Your ISP may not approve as it messes up its contention ratios and may go against your contract, but technically it is simple.

Internet Connection Sharing (ICS) software in Windows 98SE onwards lets you share any Internet connection between connected PCs. The downside is that you need to leave the first PC switched on. A neater solution is to buy a router that connects to your ISP using the modem, then deliver the Internet data to any connected device – only the router needs to be left switched on. Connect a hub or switch to the router, and you could be sharing your broadband connection between multiple devices, regardless of operating system.

Many networking companies offer boxes that do the whole job.

D-Link's DSL-504 has an ADSL modem, router and four-port Ethernet switch



D-Link's DSL-504 (left)

contains an ADSL modem, router and four-port 10/100 Ethernet switch for £145 ex VAT – not much more than the bog-standard Alcatel USB ADSL modem alone.

For wireless access to a broadband connection throughout your home or office, fit a wireless access point (Wap) to your router from just £120 ex VAT. Alternatively, broadband gateway devices are available from £150 ex VAT which include a Wap, hub and router, although the modem isn't normally built-in. It's truly liberating to then fit a Wifi card to a notebook or PDA and enjoy broadband Internet access without any cables. It's important to know that many cable modem users have reported problems when trying to share their broadband link using ICS or routers. One solution is to fit two network adaptors to the main PC, and connect the modem to one and the second PC to the other.

In the end

Broadband promises a world of always-on high-speed data that's ready to deliver an unparalleled Internet experience. In reality, though, the contention ratios often slow access during peak times and there's still a lack of unique broadband content out there.

At worst, broadband remains faster than 56K dial-ups, and at best, it's vastly superior. Unique content is also a bit of a red herring after you've enjoyed swift web browsing, omnipresent messaging and a blasé attitude to huge downloads. Unlimited dial-up accounts may cost as little as £13 per month, but any enthusiast will easily justify the extra tenner for broadband, and it's a no-brainer for business.

Recent price drops and DIY options have seen ADSL take the lead in terms of cost, performance and flexibility. Now that broadband is truly affordable, we can only hope that coverage continues to expand outside highly populated areas and that capacity is increased to cope with demand.

READ THE SMALL PRINT

Before you do anything else, check the terms and conditions of the service. Some broadband ISPs offer one or three-month contracts, but most ask you to commit to 12 months.

Changing broadband providers isn't as easy as swapping dial-up accounts. You may have to disconnect with one ISP before re-applying to another, which could leave you without broadband for several weeks.

Some broadband services employ network address translation (NAT), which could prevent you from using certain online applications, such as video-conferencing software. If you need support for H323 video-conferencing or static IP addresses, check with the ISP first.

An always-on connection presents a potential security risk, so run some kind of firewall for protection. Many routers offer firewall facilities, or you could install a software option such as Zone Alarm (www.zonelabs.com).

Finally, don't throw out that 56K dial-up account yet. You'll still need it for mobile access using a notebook or PDA, or for backup if your broadband fails.

PCW



AMD 1800XP

AMD Athlon 1800XP
 256MB PC133 SDRAM
 40Gb Hard Drive
 32x12x8x8 CDRW DVD Combo
 ATI Radeon VE 64Mb
 56K Modem
 16bit Stereo Sound
 600W Speakers
 Keyboard & Mouse
 Microsoft Windows XP Home
 Microsoft Works 2000



£499 ~~£586.33~~
 inc VAT

GigaPro

Via GigaPro CPU
 256Mb PC133 SDRAM
 20Gb Hard Drive
 Integrated Video
 52x CD ROM
 56K Modem
 16Bit Stereo Sound
 Microsoft Windows XP Home
 Microsoft Works 2000
 180W Speakers
 Keyboard & Mouse

£299 ~~£351.33~~
 inc VAT

Duron 850

AMD Duron 850
 256Mb PC133 SDRAM
 20Gb Hard Drive
 Integrated Video
 56K Modem
 16Bit Stereo Sound
 16x DVD ROM
 Microsoft Windows XP Home
 Microsoft Works 2000
 180W Speakers
 Keyboard & Mouse

£310 ~~£364.25~~
 inc VAT

Duron 1200

AMD Duron 1200
 256Mb PC133 SDRAM
 20Gb Hard Drive
 SiS 730 Video
 56K Modem
 16Bit Stereo Sound
 16x DVD ROM
 Microsoft Windows XP Home
 Microsoft Works 2000
 Keyboard & Mouse

£399 ~~£468.83~~
 inc VAT

P4 1700

Intel Pentium 4 1.7Ghz
 256Mb PC2100 DDR SDRAM
 40Gb Hard Drive
 Integrated Video
 56K Modem
 16Bit Stereo Sound
 32x12x8x8 CDRW DVD Combo
 Microsoft Windows XP Home
 Microsoft Works 2000
 600W Speakers
 Keyboard & Mouse

£499 ~~£586.33~~
 inc VAT

Monitors

CRT Monitors



15"	£74 (£86.95inc VAT)
17"	£89 (£104.58inc VAT)
19"	£145 (£170.38inc VAT)
21"	£349 (£410.08inc VAT)

Choose
 your
 monitor!

TFT Flatscreen

15" TFT	£255 (£299.63inc VAT)
17" TFT	£439 (£515.83inc VAT)

AMD 2100XP

AMD Athlon 2100XP
 256Mb PC2100 DDR SDRAM
 60Gb Hard Drive
 40x32x12 CDRW Drive
 16x DVD ROM
 GeForce 4 MX420 64Mb
 56K Modem
 16bit Stereo Sound
 Keyboard & Mouse
 Microsoft Windows XP Home
 Microsoft Works 2000



£699 ~~£821.33~~
 inc VAT

P4 2000

Intel Pentium 4 2Ghz
 256Mb PC2700 DDR SDRAM
 60Gb Hard Drive
 40x32x12 CDRW Drive
 16x DVD ROM
 GeForce 4 MX420 64Mb
 56K Modem
 16bit Stereo Sound
 Keyboard & Mouse
 Microsoft Windows XP Home
 Microsoft Works 2000



£749 ~~£880.08~~
 inc VAT

Warranty & Support

All Systems come with 1 Year RTB Warranty as standard. The following warranty upgrades are available:

1 Year On-Site Parts & Labour	£35 (£41.13inc VAT)
2 Year On-Site Parts & Labour	£99 (£116.33inc VAT)
3 Year On-Site Parts & Labour	£149 (£175.08inc VAT)

Delivery

System Unit only	£15 (£17.63inc VAT)
System Unit + Monitor	£20 (£23.50inc VAT)

More delivery options are available - see www.aria.co.uk for details!

Contact

Aria Technology Limited
IMEX Business Park
Longsight
Manchester
M13 0PD

www.aria.co.uk
 08707 444448

All Prices displayed Are Correct At The Time Of Going To Print. All Prices are in GBP. All prices are subject to availability. Prices and Specifications are Subject to Change Without Prior Notice. 25% Surcharge On Credit Card orders and additional charges for delivery apply to orders placed in telephone. Complete offer applies to computers delivered to GB mainland only. Additional charges apply for systems and deliveries to Northern Ireland, The Republic of Ireland, The Channel Islands, Guernsey, Jersey and all other Regions of the UK. Please call for further details. Your Statutory Rights Are Not Affected. Aria Technology Cannot be held Responsible for Any Damages/Claims Incurred When Following Any Advice Given. Credit & COD Terms Available Subject to Status. All Registered Trade Marks Acknowledged to Their Owners. E & OE.

Break the PC SPEED LIMIT

Stop! Don't spend your hard-earned cash on upgrades just yet, because we've got some great power-boosting tips for your PC that will cost you little or nothing

Sooner or later you'll wish your PC was going faster, but there's no need for expensive upgrades yet. Whether you own the latest Pentium 4, or even an aging 486, you'll be surprised at what you can do to improve your system with the minimum of cost.

Over the following pages we'll show you how to make the most of existing hardware and detail modest upgrades that give the biggest bang for your buck. Better still, our top 10 power-boosting tips (see page 102) cost little or even nothing to implement. A little nip and a tuck could have your PC running faster and smoother than ever.

From tweaking the Bios or overclocking your processor, to making the most of driver updates and utilities, we'll show you how to bring your PC up to speed and reveal previously untapped performance.

Increase your PC's memory

One of the cheapest, easiest and most effective ways to boost a PC's performance is to increase its memory, also known as Ram (random access memory).

In tests and everyday use, the difference that doubling your memory makes can be nothing short of monumental. Whether it's going from 8MB to 16MB or 128MB to 256MB, you'll immediately spot a big difference in overall performance.

If you're into handling large files, such as photos, videos or databases, then you'll really benefit from 512MB or even more still. To illustrate this, we timed how long it took Windows to prepare several files for printing on a 1GHz Pentium III system. A modest 3.3megapixel image printed from Photoshop took 25 seconds to spool with 128MB of Ram, compared to 10 seconds with 256MB. A 133MB Quark Xpress file took 13 minutes to spool with 128MB, five minutes with 256MB and just a minute and a half with 512MB of Ram.

Even with recent price increases, you can buy 256MB of DDR 2100 or PC133 Dimm for less than £75, so there are no excuses for skimping.

Watch out, though, as some motherboard chipsets, such as Intel's 810 and 815, will only take a maximum of 512MB of memory.

The higher cost of older types of memory may be uneconomical – see the Great expectations box below. We consequently only recommend significant memory upgrades on systems that employ 168pin SD-Ram or 184pin DDR Dimms. New Dimms are supposed to be backwards compatible, but existing memory can be fussy about new company. If you're having problems, you may have to remove old Dimms so that a new one can work properly. Before you get too upset, though, remember that 64MB of SD-Ram is only worth about £20.

Finally, if you're buying DDR memory, be aware that it comes in many flavours which may or may not work with your particular motherboard. Always check online databases such as those at www.crucial.com to ensure you're buying the right type. Also note that premium grade CAS2 memory will only operate at its best if you adjust certain Advanced Chipset settings – see the section on Bios for more details.

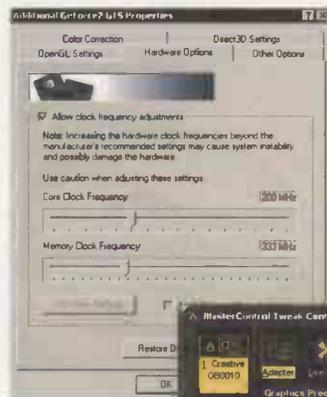
Improve graphics performance

The key to super-speedy gaming performance is simply to invest in the best 3D graphics card you can afford. Fortunately, though, in this fast-evolving 3D market, there are some things you can do to increase your existing graphics performance without buying a new card. We've measured huge performance increases of between five and 20 per cent by simply installing newer drivers.

Graphics drivers are frequently updated, so regularly check the relevant website for the latest versions. If your card is based on an Nvidia chipset, head over to www.nvidia.com. Similarly, ATI users should visit www.ati.com and so on. Latest versions of DirectX may also need to be installed from www.microsoft.com/directx. True graphics tweekers should definitely download the Powerstrip utility, which offers all manner of display adjustments, at www.entechtaiwan.com/ps.htm. We've also included the utility on this month's cover disc for your convenience.

If you're still not satisfied, then you may be able to overclock the memory or chipset on your graphics card and enjoy a slight performance increase (see screenshot top). As with overclocking your central processing unit (CPU), this can generate more heat and introduce instabilities, so take precautions and proceed at your own risk.

Surprisingly, many graphics cards come with utilities that allow you to overclock them from Windows – look for a tab in their Display Properties labelled Advanced or Performance. Interestingly this facility is hidden on Nvidia's ubiquitous Detonator drivers, but can be revealed with a quick Registry edit as follows. Start Regedit and open the HKEY_LOCAL_MACHINE. Scroll down through Software until you reach NVIDIA Corporation, then open the Global section. To access the additional controls, you'll need to modify a new Registry Key called NVTweak;



You may gain a slight performance increase by overclocking the memory or chipset on your graphics card



if this doesn't exist in the Global key, go to the Edit menu and Add a new Key, naming it NVTweak.

With NVTweak selected in the left-hand pane of the Registry Editor, you must go to the Edit menu and Add a new DWORD value, with the name 'CoolBits'. Once added, double-click on the CoolBits in the right-hand pane, and set the Value to 3, with a hexadecimal base. After rebooting your system, you'll notice that when you go to the Additional Properties of your Geforce Advanced Display Properties, you'll find an additional tab offering clock frequency adjustments.

But how can you tell if a tweak or update has made any difference? We use Quake III Arena, which features a built-in benchmarking facility. Simply type `timedemo 1`, followed by `demo demo001` at Quake's command prompt to automatically run a quick demo. Bringing up the command prompt afterwards will reveal the frame rate, and is a great way of comparing drivers, settings or graphics modes.

GREAT EXPECTATIONS

The PC industry revolves around backwards compatibility, but that doesn't mean the latest chip, card or memory can be slotted inside your aging PC. It'll probably be the wrong shape and voltage.

Even if you could place a Ferrari engine in a Mini chassis, you still won't make a sports car, so ensure the components around it are of a similar grade for the best results. For example, owners of older systems will find their processor, memory and motherboard may prevent a brand new graphics card from performing at its best.

Economies also play a big role. A 128MB memory upgrade could breathe new life into an old PC, but if it takes old 72pin Simms, their high cost could buy you 128MB of faster SD-Ram memory, plus a 1GHz processor and a new motherboard to house them all. Indeed a motherboard upgrade will support all the latest chips, memory and cards, but it really boils down to whether you have the time, effort and ability to rebuild your PC, or if you just want a quick, easy fix.

They may be pricey and you're unlikely to get the best out of them, but a dedicated processor upgrade or increase in old memory will always enhance an aging PC. For significant upgrades, though, their price outweighs the convenience. If your processor and memory upgrade costs more than £300, you'd be better off buying a new motherboard with modern components, or a new PC.

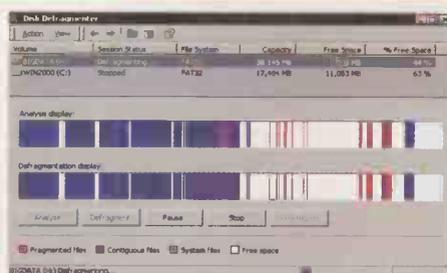
Get the most out of your hard disks

Housing the operating system (OS), applications and files, the performance of a hard disk is crucial to the overall speed of a PC. The key thing to remember is that your OS and applications need space to breathe. The ideal amount of space varies with disk size, OS and Ram, but try to keep at least several hundred megabytes or five per cent free.

If your PC is grinding to a halt due to lack of disk space, it's time for a spring clean. Use the Add/Remove Programs Control Panel to remove redundant applications, check your Temp folder for large files that haven't been deleted, and get rid of a few emails, especially those with big attachments.

Afterwards, run the defragmenting tool to consolidate your free space (see screenshot right); shut down all applications, utilities and background tasks while doing this. Freeing up space and defragmenting costs nothing and can really improve performance.

There are times when deleting files is not an option and more capacity is required. Second-hand disks are



The disk defrag tool will enhance performance

cheap and easy to install as the slave of your primary IDE channel. A new model may also be so much faster that you should consider making it your master boot drive, reinstalling Windows and your applications onto it, and using your older drive as extra storage.

The main rule when it comes to IDE hard disks is to ensure they're not connected to the same IDE channel as anything other than another hard disk. The results vary between controllers, but you could suffer from reduced performance if you connect, say, a Rom drive as a slave to a hard disk. If you have no spare connectors for a second hard disk, or have to fit a CD writer as a slave to an existing disk, then buy a PCI IDE controller card and enjoy support for four more drives – see Connectivity section below.

Finally, ensure that DMA is enabled for your hard disks. In Windows 9x, check that DMA is ticked in the Properties of the disk. In Windows 2000 and XP, open the IDE ATA/ATAPI Controllers section, double-click on the Primary IDE Channel and select Advanced Settings. Here you should have Transfer Mode set to 'DMA if available', and below this, the actual mode you're operating in (see screenshot left). If you can't enable DMA modes, try updating the driver for your motherboard chipset.



Ensure DMA is enabled for your hard disk

Software sense

It's worth mentioning software briefly. It goes without saying that updated drivers can make all the difference to the performance of a PC, so keep an eye out for new versions. Top of your list should be graphics drivers, followed rapidly by the 4-in-1 driver for motherboards with Via chipsets.

Checking for regular Windows updates and new service packs will also ensure your OS and applications are running safe and well, while a Bios update could be just the trick for solving incompatibility issues with upgraded disks or processors.

A truly super-charged PC will also employ utilities to monitor what's going on under the hood. Most motherboards these days come with software that sits in your system tray and essentially relays the information from the PC Health section of your Bios – handy for checking temperatures and setting alerts in case they get too high.



Motherboard software gathers essential information about a PC's health

Improve PC connectivity

It doesn't matter whether you've got an aging 486 or the latest Pentium, as the very latest connectivity is only a PCI card away. If you've got a spare PCI slot, you can cheaply and easily add support for Firewire, USB2, Ethernet (wireless or wired), not to mention the latest hard disks. To be safe with drivers, you should be running Windows 98 or later.

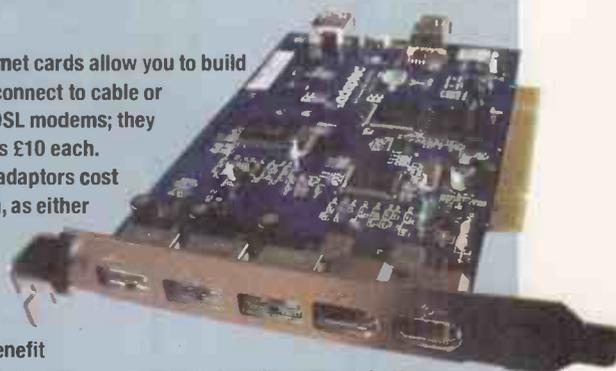
Firewire cards cost around £50 and normally come with basic software allowing you to capture and edit footage from DV camcorders – remember you'll need a camcorder with DV-in facilities to record the footage back to tape, though.

USB2 is appearing on more peripherals and while any USB2 device can be plugged into a standard USB 1.1 port, it will be limited to speeds of 12Mbps/sec. Connect a USB2 device to a USB2 port and you can enjoy speeds up to 480Mbps/sec, which is 40 times faster than standard USB 1.1.

Certainly a mouse or keyboard won't exploit the speed of USB2, but it revolutionises external hard disks and scanners. A four-port USB2 card costs around £30. If you've only got one spare PCI slot, consider Adaptec's Duo-Connect card (pictured), which offers both Firewire and USB2 ports for £80.

Wired Ethernet cards allow you to build a network or connect to cable or higher-end ADSL modems; they cost as little as £10 each. Wireless Wifi adaptors cost from £60 each, as either PCI cards or USB dongles.

Finally, if you want to enjoy the benefit of today's fastest and largest hard disks, but your current controller either won't support them, or has run out of spare connectors, then simply buy a new controller card. PCI cards, such as the Promise Ultra133 TX2, cost £50 and give you two UltraDMA133 channels along with support for drives larger than 137GB. Spend a little more and you could be enjoying Raid (redundant array of inexpensive disks) facilities, too.



Adaptec's Duo-Connect card offers both Firewire and USB2 ports

Change Bios settings

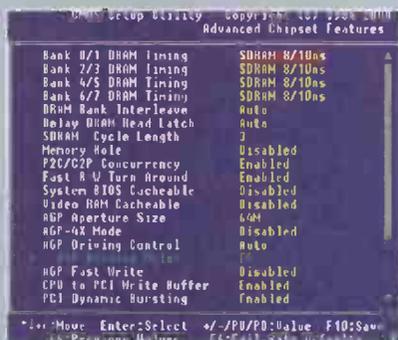
The Bios is an old-fashioned chunky chip on your motherboard, providing the means by which the PC can wake up and get started.

At its most basic, the Bios contains information on the date, time and installed drives, along with their booting order. Beyond this the Bios rapidly becomes quite complex, but a handful of options can be used to enhance the performance of your PC. Note that changing a setting in your Bios could make your PC unstable, or even prevent it from working properly, so always proceed with caution.

The page labelled Advanced Chipset Features is where you can adjust memory performance and, like comedy, it's all in the timing. Latency defines the delay between memory receiving data and actually reading it. The lower the latency, the faster the memory will perform. Most standard SD-Ram and DDR memory modules have latencies of 3 and 2.5 respectively, but faster versions of both types of memory are available with latencies of 2.

If you're using high-quality CAS2 or CL2 memory, then ensure the latency is set to 2 for the best performance. You should also try speeding up your timings from the standard 8/10ns settings to a Fast (6/8ns) or Turbo (5/6ns) option (see screenshot). We've measured between five and 10 per cent performance increases in Sysmark and Quake when switching from CAS3 to CAS2 memory.

If you have normal CAS3 or 2.5 memory, you could try adjusting its latency and timing to see if it'll handle the faster settings. If your system



Try speeding up timings to Fast or Turbo

becomes unstable, go into the Bios and change the settings back. Experiment, and be prepared for regular crashing if your memory isn't quick enough.

Performance enthusiasts should use CAS2 memory to build or upgrade a system. It's more expensive but more flexible, and available from www.overclockers.co.uk and www.theoverclockingstore.co.uk.

Protect your Bios

If you make any changes to your Bios which prevent your PC from starting up properly, it's normally possible to reset its data by shorting a jumper on the motherboard or removing the nearby battery for a few minutes. Your PC should then restart, although you'll need to re-enter any custom settings into the Bios.

There are unusual times when a Bios problem won't respond to resetting, thereby preventing your PC from restarting at all. Although such situations are rare, it's worth protecting yourself from the prospect of a dead PC. The most obvious protection is a Bios backup. Recent Gigabyte motherboards feature two Bioses and the option to switch between them. If one Bios fails, simply reboot, switch to the other, then repair the one that's gone wrong.

A similar facility is available to other motherboards using a Bios saviour. This is a chip that fits between the existing Bios and its socket, and backs up a working version of the Bios ready for when things go wrong.

Models such as those made by loss

(www.loss.com.tw), come with a switch mounted on a blanking plate to select which Bios is used for booting. You can buy the loss Bios saviour from www.theoverclockingstore.co.uk for around £30.

Alternatively you could replace the entire Bios chip with one that has working settings. Companies such as Flashbios (www.flashbios.com) supply new Bios chips programmed with whatever software you require for around £20, or will reprogram your existing one for £5. See this month's Hands On Hardware for more details.



If you get into trouble, short the Jumper on the motherboard to reset the Bios

Make that processor perform

Every major component in a PC affects performance, but the one that makes the biggest overall impact is the processor (CPU). A faster CPU means quicker games, nippier applications, less waiting time and overall a more responsive PC.

We explain on the following page how overclocking could increase your processing power for free, but what about actual processor upgrades?

Your upgrading choices boil down to what kind of motherboard you have, and how much effort you're willing to put in. If you simply want to slot in a new chip without changing any settings, check out dedicated upgrade packages from Evergreen (www.everttech.com), Powerleap (www.powerleap.com) and Hypertec (www.hypertec.co.uk). They're pricier than buying a naked processor, but you're paying for ease of use and less disruption.

Socket adaptors are rare



You can upgrade a Pentium Pro to a Celeron chip

If you'd prefer to buy a new processor by itself, you'll have to make sure you know exactly what models and speeds your motherboard can take, but be realistic, as our earlier Great expectations box explains.

Owners of Slot 1 Pentium II or Pentium III systems based on BX chipsets have a good upgrade path using certain FC-PGA Intel CPUs, in combination with Slot-1-to-socket converters. Suitable FC-PGA 'socket' adaptors are, sadly, becoming increasingly rare, but suppliers such as www.overclockers.co.uk were still selling Asus models for £15 at the time of writing.

For the least disruption, you should upgrade to an FC-PGA CPU which uses the same FSB (front-side bus) frequency as your existing chip – this will either be 100, or 133MHz for later PIII models. Most Slot 1 motherboards will also only support FSB multipliers up to eight-times, which generally limits you to sub-1GHz processors; these are only now available on the second-hand market.

The most impressive processor upgrade on sale today for old Slot 1 or Socket 370 systems are made by Powerleap. It sells converters from £150 fitted with Intel's latest Tualatin FC-PGA2 processors, including the 1.26GHz Pentium III.

Overclock your processors

Overclocking is the process of forcing a component to work faster than it was designed to. It normally refers to the main processor, but can be applied to pushing the frequency of any component.

If all goes well, your processor could enjoy a few hundred extra megahertz for free, but remember this is done entirely at your own risk. Overclocking could permanently harm your components and will certainly put them out of warranty, and as such we cannot officially support it. It's also far from guaranteed to actually work.

With that warning out of the way, we can explain the two keys to overclocking. On the theoretical side, the processor's speed is calculated by multiplying the front-side bus (FSB) by the processor's clock multiplier. On the practical side, you've got to ensure the processor and any related components are physically capable of handling the new, higher speed.

The theory is simple, so long as you know which numbers to use in your calculations. AMD's Duron and Athlon processors may boast system buses of 200 and 266MHz, but do so by applying double-data rate (DDR) technology to a 100 or 133MHz FSB. Similarly the Pentium 4's impressive 400MHz system bus is achieved by applying quadruple-data rate to a 100MHz FSB. New 533MHz system bus P4s have a 133MHz FSB.

The main figure overclockers need is the plain FSB, which for current Intel and AMD processors is either 100 or 133MHz. This is multiplied by a fixed number to calculate the core clock speed.

A 2GHz Pentium 4 has a 100MHz FSB, and a 20-times clock multiplier. A 1.2GHz AMD Duron also has a 100MHz FSB, and therefore a 12-times clock multiplier. An Athlon XP 1800+ has a core speed of 1,533MHz and a 133MHz FSB, which means it has an 11.5-times clock multiplier.

THE UPGRADER'S BIBLE

The motherboard manual is your bible during the tweaking or upgrading process, as it details the slots and sockets in your system, along with the fastest or largest components it can handle. Check the motherboard manufacturer's website for updated support information too.

If you've lost the manual, head to the motherboard manufacturer's website and download an electronic version. If you don't know the manufacturer, an ID code displayed at startup can identify the brand and model – see www.motherboards.org/moboidtools.html.



Refer to the manual before tweaking your motherboard

OVERCOME OVERCLOCKING PROBLEMS

To overclock the processor, all you need to do is gradually increase the FSB (front-side bus) and/or the clock multiplier to achieve the desired speed, but sadly this isn't always possible in practice. Intel and AMD immediately put a spanner in the works by locking the clock multipliers on their processors. So this leaves little option but to increase the FSB, but this in turn impacts other components. The AGP, PCI and memory buses are all driven by a fraction or multiple of the FSB, and therefore increasing it could push any or all of them into instability.

The PCI bus should run at 33MHz, but is normally calculated as one-third or one-quarter of the FSB. If the PCI is set at one-third of the FSB and the latter is increased to, say, 110MHz, then the PCI bus will be pushed to 36MHz. Some PCI devices will put up with this, but others may not.

The AGP bus should run at 66MHz, and is normally calculated as two-thirds or one-half of the FSB. Again, an interim FSB of 110MHz will use the lower two-thirds multiple, and hence drive the AGP bus to 73MHz – this could push some graphics cards over the edge.

Memory is also only rated up to certain speeds, and will make your system extremely unstable if pushed beyond its limits. One solution is to swap existing memory for faster rated modules, such as DDR2100 being replaced with DDR2700. Alternatively, your Bios may allow you to reduce the memory clock either by using a lower multiple of the FSB or selecting the 'host clock minus 33MHz' setting.

The processor itself is also unlikely to achieve overclocked speeds unless its core voltage is increased, which in turn generates more heat, with the potential for instability or damage. Additional cooling is

therefore an essential requirement for overclocking, and significant increases will demand exotic liquid-cooled solutions – see Cooling section later. Don't neglect to cool other components too – the chipset northbridge can get hot, especially in an overclocked system.

Finally, processors are produced using manufacturing processes that have a ceiling on possible core clock speeds. If you want to overclock your processor, you need to know its limits and ensure the desired speed is nowhere near that ceiling. Even if it's overclocked within the limits, there's no guarantee it'll work – some chips are simply more overclockable than others.

Just when you thought that was all, remember you won't be able to overclock unless your motherboard has manually adjustable settings for the FSB or clock multiplier, not to mention some way of increasing the core voltage. Before you consider any overclocking projects, ensure your motherboard offers the required control.

The trick with overclocking is also to take it one small step at a time. Sure, it's tempting to go for a 33 per cent increase on your first attempt, but try to resist that temptation and start with the smallest increments first.

If this is successful, try increasing by another small step, and so on until your system can take no more. At this point, go back to the last successful setting. If you overclock too far, your PC will act strangely, crash regularly, or not start up at all. If you were using the Bios to make adjustments, then a non-starting PC presents a Catch-22 situation – see Protecting your Bios section. This is why overclockers prefer motherboards with physical switches or jumpers as they are easy to return to a proven configuration.



Don't rush it... take overclocking one step at a time

Overclocking the Pentium 4

Intel locks the clock multiplier on its Pentium 4 processors, forcing overclockers to increase to the FSB (front-side bus) and take care that the other components can cope.

In terms of the manufacturing limits, the original 0.18micron Willamette core used on the first Pentium 4s is unlikely to work beyond 2GHz. The latest 0.13micron Northwood core, however, has the potential to work at 3GHz and beyond.

Northwood is employed on Pentium 4s labelled with an A, or any running at 2.2GHz or above. Be aware that Pentium 4s between 1.6GHz and 2GHz are available with both cores, but the Northwood versions are clearly the best bet for overclockers – they even run faster than the old ones at the same clock speeds.

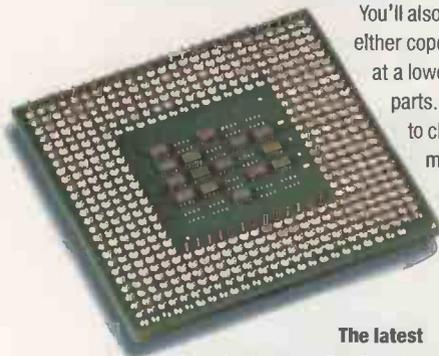
Let's consider the 2.4A model which runs at 2.4GHz with a 24-times multiplier on a 100MHz FSB. If the FSB was increased to, say, 125MHz, then the processor would attempt to be driven at 24 times 125, or 3,000MHz. Even a 110MHz FSB setting would give you a respectable 2,640MHz clock speed that might even work with normal air cooling.

Sadly these interim FSB settings between 100 and 133MHz will normally clock both the PCI and AGP buses beyond specification, which could cause problems. A 133MHz FSB would be ideal, as it normally allows an official one-quarter and one-half PCI and AGP setting, but this could prove too much of an overclock for a processor designed to run externally at 100MHz.

You'll also need to ensure your memory can either cope with the higher speeds, be clocked at a lower rate, or swapped for faster rated parts. Many RD-Ram systems allow you to clock their memory at different multiples of the FSB. Normally it would be set at four-times to achieve 400MHz with a 100MHz FSB, but a lower three-times setting could keep memory within spec despite increasing the FSB.

Finally, you'll need to feed your processor some extra juice for stability or to even start at all. The Northwood Pentium 4s are

designed to run with a core voltage of 1.5v, but most motherboards won't allow you to pump more than 1.65v into them. Heavy Northwood overclocking requires nearer 2v, forcing the truly dedicated to take a soldering iron to their motherboards, or at least buy models that support more than 1.65v. Note that such extreme overclocking demands exotic liquid-cooled solutions – see Cooling section.



The latest 0.13micron Pentium 4s could overclock to 3GHz and beyond

Overclocking the AMD Athlon

Like Intel, AMD locks the clock multiplier on its Athlons, but there are ways to unlock the chip. These involve reconnecting tiny electrical bridges (labelled L1) on the surface of the chip itself, which were previously broken by AMD. On pre-XP Athlons running up to 1.4GHz, this was possible by drawing a tiny line between the bridges using a graphite-rich pencil (see picture), as explained in December 2001's Hands On Hardware.

Athlon XPs are trickier, as they use a different base material for which a pencil mark has insufficient electrical conductivity. The solution here is to fill in the breaks with an insulator such as glue, then apply conductive silver lacquer to electrically rejoin each bridge. This is an extremely fiddly process which we'll leave to the extreme websites, and concentrate here on increasing the FSB instead.

Current Athlons should handle at least a 10 per cent increase, with a little extra core voltage. The XP Athlons are designed to run at 1.75v, so consider increasing this to 1.85v, with the help of extra cooling. The highest overlocks will demand voltages above 1.9v, which are only offered on some motherboards.

Modern Athlons run on a 133MHz external FSB, and normally drive their memory at the same external speed. Raising the FSB above 133MHz could push existing memory over the edge, so fit faster parts or use the Bios to reduce the memory clock where possible. Remember, too, that FSBs above 133MHz will normally be pushing the PCI and AGP buses into potential instability.



Reconnect the electrical bridges with a graphite-rich pencil line



Keep a check on the overclocking status

Overclocking other processors

To date, all of AMD's Duron processors have been made with the same 0.18micron process that allows Athlon XPs to run at genuine clock speeds up to 1.8GHz. While you're unlikely to be able to overclock a modest Duron to such heady heights, it still has great potential.

Sadly, the Duron seems to be impervious to being unlocked, which once again forces you to increase the FSB. Since Durons are designed for a 100MHz external FSB, there are many increases that can be made without fitting anything more exotic than 133MHz or PC2100 DDR memory.

Again, you're unlikely to have success by increasing the FSB all the way to 133MHz, but interim settings up to 110MHz should work, and still deliver 10 per cent extra performance with traditional air cooling. As always, be aware that your PCI and AGP buses may subsequently be running beyond specification. Similar theories apply to the Intel Celeron, which has been running on a 100MHz FSB from the 800MHz version upwards.

The Pentium III has good overclocking potential, especially if you have a model running between 600 and 1,000MHz.

These were made with a 0.18micron process, which maxes out around 1.1GHz. The lower speeds should certainly be able to squeeze at least 10 per cent extra with modest core voltage increases of 0.05 or 0.1v.

Once again you're looking at increasing the FSB. If your Pentium III is running on a 100MHz FSB, then you'll need to fit 133MHz memory to cope with the increases, and as always you should take care not to push your PCI and AGP clocks too far. If your Pentium III is already running on a 133MHz FSB, you'll probably need to fit faster PC150 memory, which you can buy at www.overclockers.co.uk.

Intelligent Power Stepping

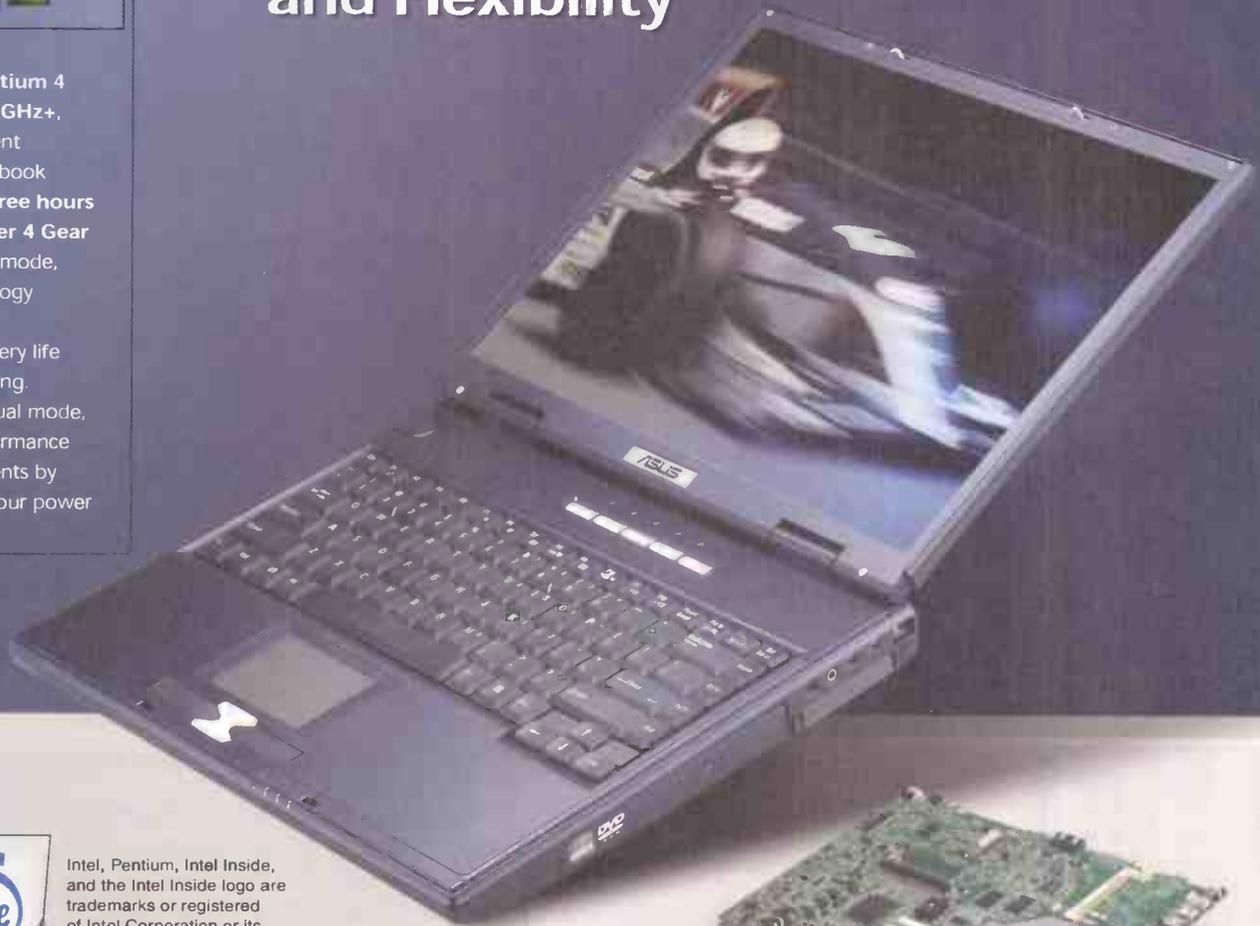


While supporting Pentium 4 processors up to 2.0GHz+, the ASUS L3C's efficient design enhances notebook battery life up to three hours thanks to ASUS Power 4 Gear technology. In Auto mode, Power 4 Gear Technology intelligently optimizes performance and battery life based on system loading. Power 4 Gear in Manual mode, users can define performance and battery requirements by choosing one of our four power optimizing modes.

ASUS L3 All-In-One Notebook PC

Revolutionary Performance and Flexibility

L3 Series



Intel, Pentium, Intel Inside, and the Intel Inside logo are trademarks or registered of Intel Corporation or its subsidiaries in the United States and other countries.

Mobil Intel® Pentium® 4 Processor-M

The ASUS L3C introduces a new era in notebook computing by bringing Pentium 4 performance to the road. Its compact all-in-one design delivers a notebook that's robust in features, incredible in performance, and perfect for any situation. Leading-edge features such as 15" LCD display, 2.0GHz+ Pentium 4 processor, DDR memory support, and 32MB dedicated ATI M7 graphics, make the L3C one of the most powerful notebooks on the market.

ASUS notebook PCs recommend Windows XP Professional for business.

<http://www.microsoft.com/piracy/howtotell>



Revolutionary Notebook Performance

The ASUS L3C leverages the advanced Pentium 4 processor to bring desktop power to the road. 32MB ATI M7 graphics deliver compelling performance in 3D games and graphical intensive programs, while up to 1024MB of DDR memory provides the necessary bandwidth for today's most demanding applications. For those who still want to go faster, the ASUS L3C also lets you turbo boost performance thanks to its unique thermal design.

Landmarq
Landmarq Technologies Ltd
Tel: 0208-768 9301
Fax: 0208-768 9311
www.landmarq.co.uk

MINILAND
Miniland Tech Ltd
MINILAND TECH LTD.
Tel: 0121-486 2888
Fax: 0121-486 1888
www.miniland-tech.co.uk

SPD
LIMITED
SPD Limited
Tel: 0142-056 3588
Fax: 0142-056 2206
www.spd.ltd.uk

ASUS
www.asus.com

FEATURE IMPROVE YOUR PC'S PERFORMANCE

Cool down your components

As PC components go faster, they get hotter. Since this applies to processors, graphics cards and hard disks, the inside of an enhanced PC will begin to resemble an oven, which could in turn harm your components. Higher voltages required by overclocking further accentuate this problem, which is why cooling is, quite literally, a hot topic.

The one cooler that is absolutely compulsory is the one on top of your processor, as without this or thermal protection, it would literally fry within seconds. That's not to say the one that came as standard with your PC is adequate. Use monitoring utilities or the PC Health section in your Bios to check the temperature of your processor after long periods of use.

There's no set rule, but if it's above 60°C, then you should consider fitting a more substantial cooler to your CPU.

Traditional CPU heatsinks employ air cooling with fans, but these won't cut the mustard for truly heavy overclocking. Instead you're looking at liquid cooling which consists of pipes pumping coolant over the processor while removing heat with tiny

radiators; some even go as far as employing active refrigeration fluids. Complete water cooling systems cost over £100, or the squeamish can buy them already fitted to speciality cases, complete with temperature gauges from £150. (See also our review of a liquid-cooled PC p48.)

Processor coolers may be fashionable, but there's no need for your other components to become hot under the circuit boards.

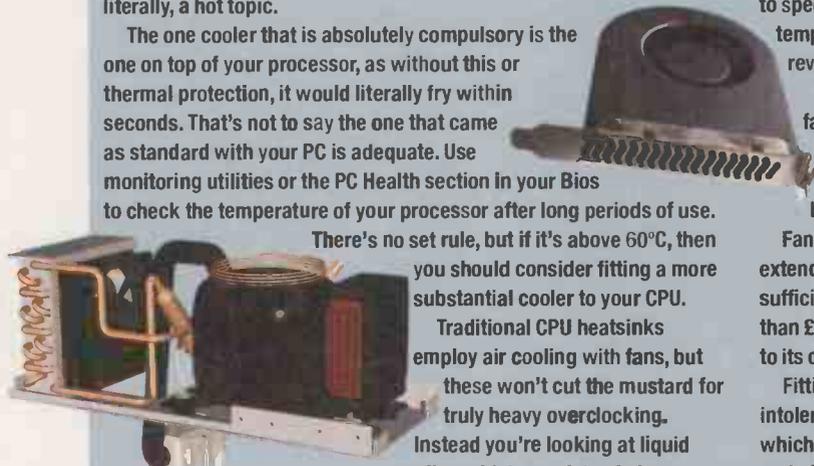
Fans attached to hard disks and even over memory cards can extend the life of overheating components, while case fans will ensure sufficient airflow is maintained inside your PC. Such fans can cost less than £10 – we'd recommend any self-enhanced PC has a couple fitted to its case.

Fitting coolers is all very well, but the resulting noise levels can be intolerable. Sensitive users could use larger, but slower rotating fans, which deliver the same airflow with lower noise. Vibration-absorbing pads fitted around the case also reduce noise levels.

A variety of cooling accessories are available from websites such as www.theoverclockingstore.co.uk and www.overclockers.co.uk.



Case fans (above) and slot fans (centre) can extend the life of overheating components boards.



Liquid coolers pump coolant over the CPU

Get the right cases and power supplies

Cases and power supplies are probably the least exciting PC components, but they're an essential part of a boosted system. As you add increasingly power-hungry processors, graphics cards and a multitude of internal drives, greater stress is placed on the power supply.

If you're building or upgrading a high-spec machine, ensure the power supply can cope. The bare minimum these days is 300 watts, with most enthusiasts selecting 400w models or higher; if you have a Pentium 4 or high-end Athlon motherboard, you'll also need an ATX supply with supplemental power plugs, so check the manual to make sure you choose the right one. Decent power supplies cost £50 to £100 and can easily be fitted into a standard ATX case.

Speaking of which, you may want to go for a bigger case to accommodate plenty

of internal drives or unusually large motherboards and heatsinks. The extra space also allows superior airflow and cooling possibilities. We're not suggesting you buy a faceless beige box though.

If you're proud of the insides of your enhanced PC, why not show them off by fitting a coloured neon light inside the case and cutting a window in the side?

Check out www.coolcasemods.com for inspiration and tools.

Check the power supply can cope with whatever upgrades you're planning



Don't hide it all away – show off and light up your PC's internals



10 PC POWER BOOSTING TIPS

You should have a good idea, now, of how to get more performance out of your PC, but here's a handy reminder – our top 10 power-enhancing tips.

- Try overclocking your processor for free extra performance. Remember to keep it cool though.
- You can never have too much Ram, especially if you're into audio visual applications. 256MB costs just £75.
- New graphics drivers can increase your 3D performance by up to 20 per cent – free of charge.
- Ensure you have several hundred megabytes free on your hard disk, or your PC will grind to a halt.
- Defragment your hard disk every few months to get maximum performance.
- The latest connectivity such as Firewire or USB2 is only a PCI card away – from £30 per card.
- Protect your PC from potential death by backing up your Bios with a £30 saviour chip.
- Stay cool. Fast PCs get hot, so install fans in the case and onto overheating components.
- High-quality memory may handle faster speeds – try adjusting memory timings in the Bios.
- Don't run out of power – enhanced PCs need at least 300w supplies, which cost from £50.

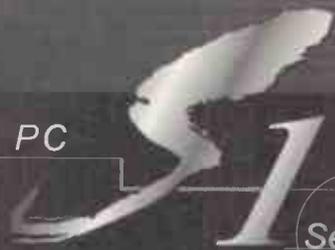
And finally...

So there you have it. Plenty of ways to enhance your PC and keep it running happily without spending a fortune. If this feature has whetted your appetite for tweaks and upgrades, then check out our regular Hands On column dedicated to hardware every month.

We'd love to hear how you've got on power boosting your PC, so email us at letters@pcw.co.uk.

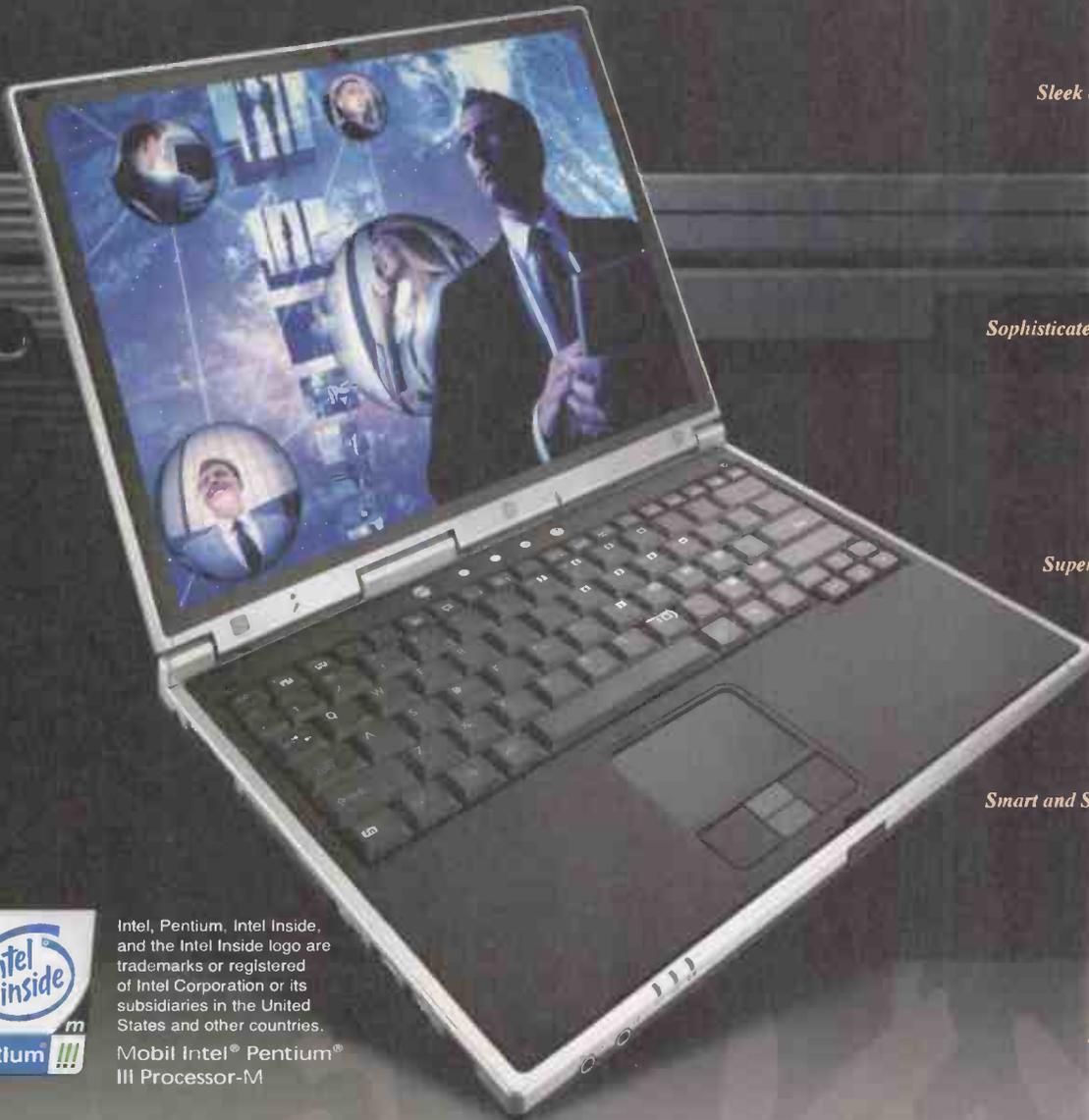
PCW

ASUS NOTEBOOK PC



Exquisite Series Mobility

A touch of elegance with high-performance



Sleek and Sexy touch



Sophisticated Performance



Superior Innovation



Smart and Simple Lifestyle



Superb Quality



Intel, Pentium, Intel Inside, and the Intel Inside logo are trademarks or registered of Intel Corporation or its subsidiaries in the United States and other countries.

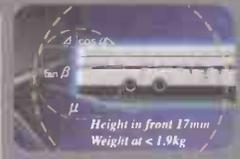
Mobil Intel® Pentium® III Processor-M

- Max Intel PIII-M 1-1.4GHz and 830M 3D graphics

- 802.11b wireless LAN built-in (PCMCIA or MiniPCI)

- Ai-Box swappable multi-module DVD + CD-RW

- 13.3" LCD, 17-26mm thin and <1.9kg weight



ASUS notebook PCs recommend Windows XP Professional for business.

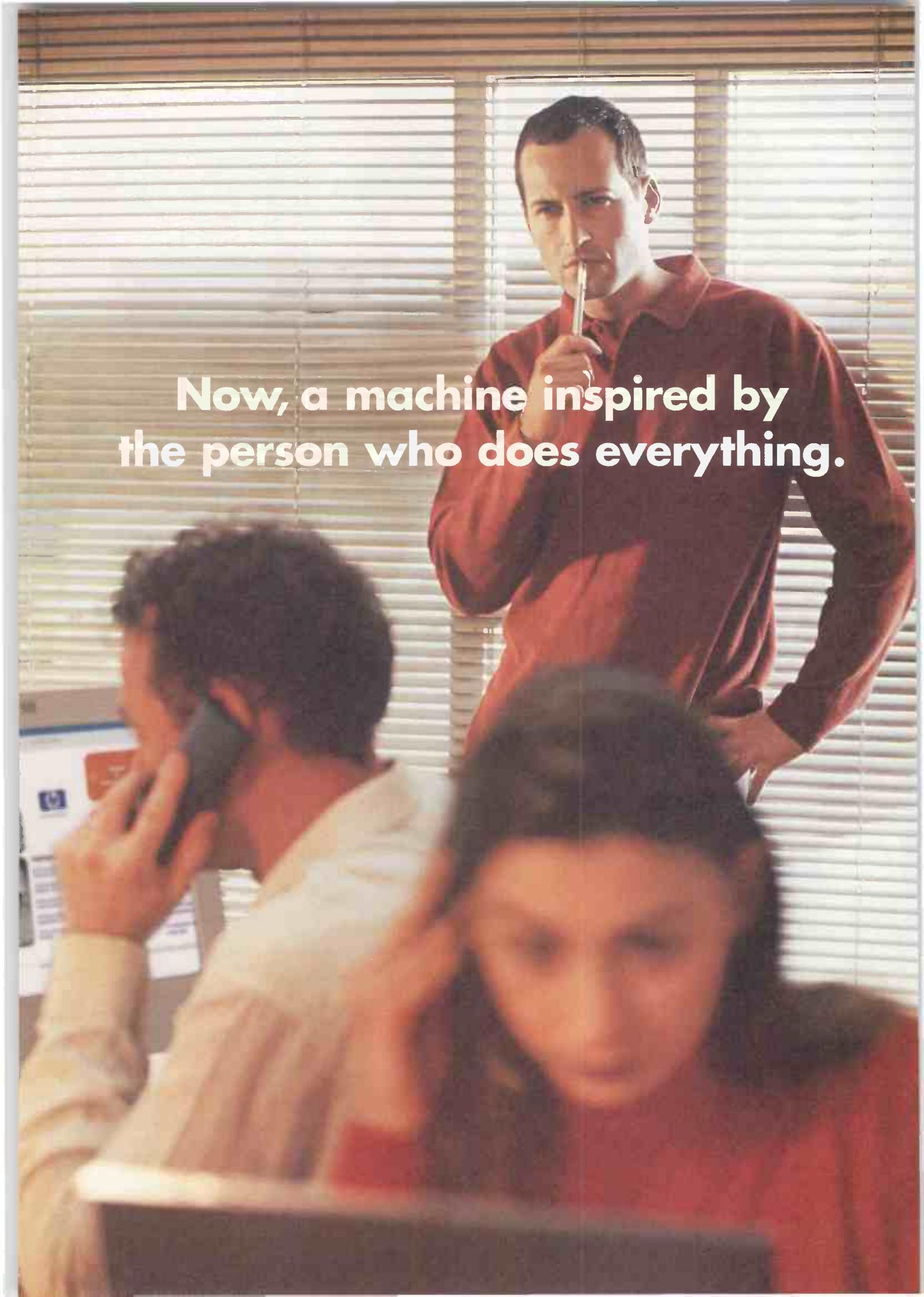
<http://www.microsoft.com/piracy/howtotell>

Landmarq
Landmarq Technologies Ltd
Tel: 0208-768 9301
Fax: 0208-768 9311
www.landmarq.co.uk

MINILAND
Miniland Tech Ltd
MINILAND TECH LTD.
Tel: 0121-486 2888
Fax: 0121-486 1888
www.miniland-tech.co.uk

SPD LIMITED
SPD Limited
Tel: 0142-056 3588
Fax: 0142-056 2206
www.spd.ltd.uk

ASUS
<http://www.asus.com>



**Now, a machine inspired by
the person who does everything.**



hp LaserJet 3300 mfp series - NEW

- printing up to 14ppm
- 1200 dpi monochrome print quality
- colour scanning at 600 dpi (9600 dpi enhanced)
- copying 14ppm
- 33.6 kbps fax
- network capable via optional hp JetDirect print server (standard with LJ3320N mfp)

from £ **385** ex. vat

£ **453** inc. vat



hp LaserJet 4100 mfp - NEW

- printing and copying up to 24ppm
- 1200 dpi monochrome laser print quality
- copying at 600 dpi
- colour scanning
- networking capability standard
- send-to-email

from £ **2299** ex. vat

£ **2702** inc. vat



hp LaserJet 9000 mfp - NEW

A network-capable powerhouse offering finishing, stapling and booklet making options for the large workgroup and department. Super-fast: 50ppm and print/copy up to A3.

from £ **7489** ex. vat

£ **8800** inc. vat

Imagine, if only there were a machine in your office that was half as multi-talented as you.

Rewind. Now there is – in the pleasingly compact shape of an HP mfp (multi-function product). That's right, a machine that not only prints as only HP knows how, but also does everything else too, including scanning, copying and sending documents digitally – it's a real powerhouse of versatility.

What's more, there's a highly compatible HP mfp solution to suit every working environment, from modest home-office to a large, busy department – each one designed to improve workflow and increase productivity day in, day out.

To find out more about hp mfp versatility, finance and support schemes call 0870 787 4959 or visit www.hp.com/uk/mfps



i n v e n t

Intel® 845G
CHIPSET

With Intel®
Extreme Graphics

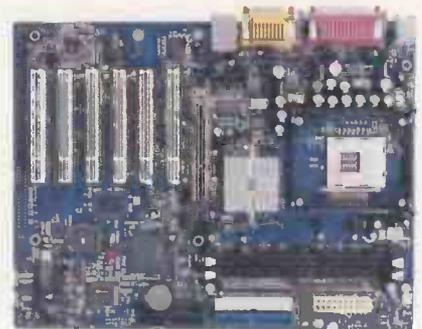
Featuring Intel®
Application Accelerator

Excellent Performance Outstanding Value

QDI PlatiniX 8-A

**Supports FSB 533MHz, USB 2.0
Integrates Intel® Extreme Graphics**

- **CPU:** Intel® Pentium® 4 Processor (478 pins)
- **Chipset:** Intel® 845G/ICH4 Chipset
- **FSB:** 533/400 MHz
- **Memory:** DDR266/200
- **Form Factor:** ATX/1AGP/6PCI
- **Onboard:** AC' 97 Audio
- **USB:** 6 USB 2.0 Ports
- **Graphics:** Integrates Intel® Extreme Graphics
- **QDI Innovations:** StepEasy II, LogoEasy II, RecoveryEasy II, SpeedEasy II, BootEasy, BIOS-ProtectEasy, Hardware Doctor, Triple Protection for CPU



Images may not represent exact product

QDI Computer (UK) LTD.
2/F, Seymour House, 186 High Street,
Slough, Berkshire SL1 1JS
Tel: (44) 1753 554004 Fax: (44) 1753 550885



www.qdigrp.com
www.qdieurope.com



WORDS & TESTING: LEO WALDOCK PHOTOGRAPHY: BRUCE MACKIE

Laptops for less

Do you want to buy a notebook without spending a fortune? We've tested 15 affordable portables to help make your choice easier

CONTENTS

NOTEBOOKS UNDER £999

- 108 Toshiba Satellite 3000
- Iridium Starbook 510
- Mesh Pegasus 1500+ 14.1in Pro

- 109 Hi-Grade Notino 2200
- Rock Sigma SI

£1,000 TO £1,299 NOTEBOOKS

- 109 ACI Powerlite
- Evesham Voyager 5600
- 110 Hi-Grade Ultinote M6400 C1700
- HP zt1151
- 111 Tiny Mediabook Extra 1200 CD-R
- IBM R31
- NEC Versa Pentium

- 114 AJP 5600P
- Rock Zeno
- Toshiba Satellite 6000
- 117 Performance results
- 118 Table of features
- 120 Editor's Choice

Notebooks are slender objects of desire that free you from your desk. They let you send email to your friends and family while you're on holiday, and make long journeys more fun, giving you the chance to watch DVDs when you're stuck in the passenger seat of a jam-bound car.

The snag is that a notebook is invariably more expensive than a comparable PC. This is partly due to the battery that a notebook must have, as well as the extra engineering involved in power saving and cooling that most PCs just don't need. Then, of course, there's the display panel.

As a result it is quite easy to spend £2,000 on a notebook, which is a substantial sum of money. However, recent research from Romtec-GFK showed that 45 per cent of notebooks sold in the UK had a price ticket of under £999 and another 45 per cent were priced below £1,299.

So, with a £1,299 price limit, we set out to discover what you could get for your money, and were pleasantly surprised at the results. We ran our suite of benchmarks and tests on 15 notebooks to see what's on the market – with our help you can avoid the lemons and buy yourself a peach. >

GROUP TEST NOTEBOOKS

Toshiba Satellite 3000

NOTEBOOKS UNDER £999



PRICE £999 (£850.23 ex VAT) **CONTACT** Toshiba 01932 828 828 www.toshiba.co.uk

PROS Good performance; good value; excellent battery life **CONS** No Firewire or infra-red

OVERALL The Satellite 3000 scores in all the right places

FEATURES ■■■■ **PERFORMANCE** ■■■■ **VALUE FOR MONEY** ■■■■

BATTERY LIFE ■■■■ **OVERALL** ■■■■

Our Editor's Choice in the £999 bracket is the understated dark blue and silver Toshiba Satellite 3000. Styling isn't a crucial issue, but let's not forget that a notebook is frequently on show, and the 3000 looks good.

It is really a notebook for the home user, rather than the full-on road warrior, as it includes Windows XP Home and minimal connectivity. There is nothing too critical missing from the specification, but if you happen to need Firewire, Lan or infra-red, this isn't the notebook for you. Connectivity is the 3000's weakest point and it receives only two out of five for features as a result. But the rest of the notebook more than makes up for this.

Performance is excellent – in fact the Toshiba wipes the floor with the

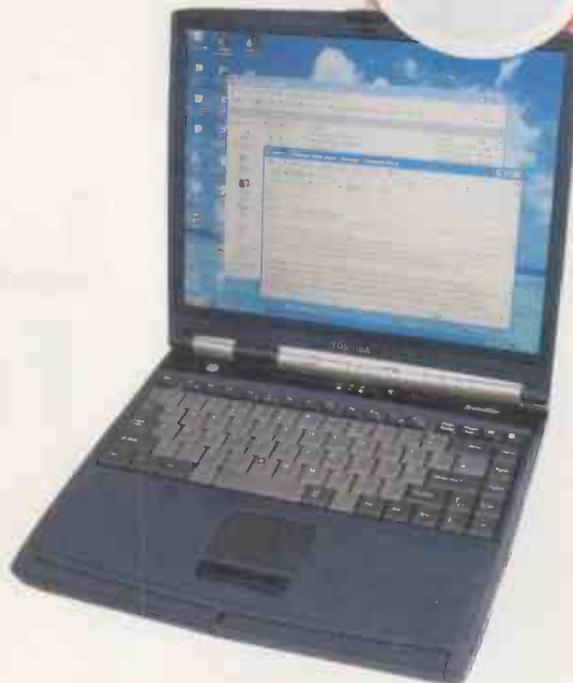
other notebooks using the same processor, and highlights the poor performance of the HP zt1151.

The IBM R31 has a very similar specification, but the Satellite 3000 is speedier than that notebook as well. If the substantial performance boost is down to the chipset alone we are impressed and amazed.

In addition to decent performance you get plenty of memory and the Satellite's battery life is the best of the group. Graphics performance is competent by notebook standards – in fact the Satellite 3000 was the only £999 notebook in the group to complete the graphics tests.

Toshiba gives you a lot of notebook for £999 and we feel the cost cutting on the specification is entirely justified.

It's a winner, and rightly so.



The Toshiba Satellite 3000 offers stunning performance

NOTEBOOKS UNDER £999

Iridium Starbook 510



PRICE £938.83 (£799 ex VAT) **CONTACT** Iridium 0870 0660 222 www.iridium-uk.com

PROS Fully featured; fair battery life **CONS** Poor performance **OVERALL** A decent notebook, but there are better in this group

FEATURES ■■■■ **PERFORMANCE** ■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■■ **OVERALL** ■■■■

In most respects the Iridium 510 fails to shine in this group. It has very few really bad points per se, although performance is a concern. This is puzzling as the specification is very similar to the Hi-Grade Notino 2200. But the figures speak for themselves.

On the positive side, the construction feels solid, and the keyboard is good to type on. Granted this is a little flexible, but it is significantly better than the Rock Sigma SI. The best part of the Iridium is its specification. The only plausible ways to improve it would be a DVD/CD-RW combo drive and a serial

port. It could also do with better design as the ports are all on the back. One of the strengths of the HP zt1151 is the headphone socket and USB port that are as close to hand as possible. That type of careful design is a sure way to win friends.

When you type on the Iridium your hands lie on the speakers and sound quality is muffled as a result. It is also a little disappointing that the Iridium includes the bare minimum of software. This is not a bad notebook, though, and it looks quite good on paper. It just doesn't perform well enough in reality.

Mesh Pegasus 1500+ 14.1in Pro

NOTEBOOKS UNDER £999

PRICE £999 (£850.21 ex VAT) **CONTACT** Mesh 020 8208 4706 www.meshcomputers.com

PROS Good performance **CONS** Terrible battery life **OVERALL** Strictly for use on mains power

FEATURES ■■■■ **PERFORMANCE** ■■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■ **OVERALL** ■■■■

The Mesh should be a real contender in this group, but with an appalling 44-minute battery life it has no chance. If you plan on your notebook spending most of its life plugged into the mains power supply, though, it is worth considering the Pegasus.

It is physically similar to a number of the notebooks tested here and has a decent screen and solid keyboard. The layout is uninspired, but then so is much of the competition, and all the ports are lined up on the back, along with the processor cooling exhaust.

Performance is decent enough, although we were surprised that the Toshiba Satellite 3000 managed to beat it in Sysmark tests. We were fairly impressed by the specification of the Mesh. The only glaring omission is its lack of Firewire, but we can't imagine using the S3 Twister graphics for video editing.

Connectivity is a positive strength here. Firewire apart, the Pegasus has the full set, and it would make a perfectly adequate portable workstation – just make sure there's a power point close to hand.



Hi-Grade Notino 2200

PRICE £999 (£850.21 ex VAT) **CONTACT** Hi-Grade 020 8532 6113 www.higrade.com

PROS Excellent design; good performance **CONS** None to speak of

OVERALL A decent, small notebook

FEATURES ■■■■ **PERFORMANCE** ■■■■ **VALUE FOR MONEY** ■■■■

BATTERY LIFE ■■■■ **OVERALL** ■■■■

The Hi-Grade Notino 2200 stands out in this group with its 12.1in screen and tiny physical form. It's a lovely piece of design and steers clear of the faults we picked with the Rock, Mesh and Iridium. All the ports and sockets are on the sides and there is nothing on the back at all. Granted, the Notino is missing infra-red and serial ports, but those are rarely used at home. The only significant missing feature is the lack of a PS/2 port for a mouse – we are being forced down the USB route, whether we like it or not.

For such a slender notebook the performance is excellent. The SIS chipset and 1.06GHz Celeron combine to score well in Sysmark, and yet the notebook seems to generate no heat. As a result you get decent battery life and should just about be able to watch a whole movie

on one battery charge. The limiting factor is the SIS graphics, although they are certainly adequate for the job. Although the screen is smaller than the much more common 14.1in, it still has the same 1,024 x 768 resolution and is comfortable to use.

Hi-Grade feels confident about the Notino as it offers a two-year return to base warranty and free insurance against accidental damage.

You may have spotted that it scores three out of five in every category and wondered why it sneaks ahead of the opposition to win our Highly Commended award. Its main strength is intangible and doesn't appear on the features table, although it is shared with the HP z1151. It's the way the Notino has been designed and the attention to detail that makes all the difference.

NOTEBOOKS UNDER £999



Performance and design make the Hi-Grade Notino 2200 a winner

NOTEBOOKS UNDER £999

Rock Sigma SI

PRICE £997.58 (£849 ex VAT) **CONTACT** Rock Direct 0870 9909 090 www.rockdirect.com

PROS Plenty of memory; good connectivity **CONS** Poor performance; battery life **OVERALL** We can't recommend the Sigma SI

FEATURES ■■■■ **PERFORMANCE** ■■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■■ **OVERALL** ■■■■



Where on earth did all the performance go? The Sigma SI has a Pentium III and plenty of memory, yet its Sysmark score ended up between the Iridium Starbook 510 and Hi-Grade Notino, both of which use a Celeron processor. This just goes to show that a decent notebook is more than the sum of its parts.

The specification is fair, although a CD-Rom, rather than a DVD-Rom is a touch mean as one of the uses for a notebook is to watch movies. We also didn't like the keyboard, which flexes and bounces quite alarmingly.

Battery life is shorter than we would like to see, and would barely be adequate for an hour's commute. Perhaps it's as well you don't get a DVD-Rom, as this battery life will never allow you to watch a whole movie in one sitting.

Those are the bad points out of the way, but sadly that leaves very little else. The main strength of the Rock is its connectivity. You get modem, Lan, infra-red, USB and Firewire. If you require all those features that's all well and good, but if you don't, we suggest you look at another option.

ACI Powerlite

PRICE £1,287 (£1,095.32 ex VAT) **CONTACT** ACI 020 8357 1116 www.aciplc.com

PROS Design; good battery life **CONS** Performance isn't good enough **OVERALL** A decent notebook, but the Notino is better

FEATURES ■■■■ **PERFORMANCE** ■■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■■ **OVERALL** ■■■■

The first of the sub-£1,299 notebooks, ACI's Powerlite, has a very sleek design. It's not as small as the Hi-Grade Notino 2200, but it is one of the smallest and lightest notebooks on test. The touchpad is sensitive and the keyboard is a good size and fairly solid when typing, although the one on our review unit was prone to occasional mis-keying.

The SIS chipset gives good performance, but on the 3D graphics front things are quite abysmal. This is no problem for day-to-day tasks such as email and office use, and the screen is a decent size and

bright and clear, but don't expect to play games. Similarly, the speakers are barely up to the job of music playback, but are fine for Windows sounds. ACI includes Lotus Smartsuite rather than the more expensive Microsoft Office, but it is good to see a full office suite included in the price.

The power connector sticks out of the right-hand side of the chassis and could be knocked while the ACI is on charge. But overall, this is exactly the sort of budget notebook you should consider as a backup to your desktop PC for use on the move.

£1,000-£1,299 NOTEBOOKS



GROUP TEST NOTEBOOKS

Evesham Voyager 5600

PRICE £1,291.33 (£1,099 ex VAT) **CONTACT** Evesham 0870 160 9500 www.evesham.com

PROS Impressive Sysmark score; very good battery life **CONS** The features list is rather spartan

OVERALL A very good notebook for less than £1,299

FEATURES ■■■■ **PERFORMANCE** ■■■■ **VALUE FOR MONEY** ■■■■

BATTERY LIFE ■■■■ **OVERALL** ■■■■

With its 1.8GHz Pentium 4 processor the Evesham 5600 storms to the top of the charts in this group. It completed its benchmarks well and has a decent battery life.

The Voyager's graphics performance is less spectacular, but the ATI Mobility Radeon inside is a good chip and is only beaten here by the AJP 5600P with the Mobility Radeon 7500.

You can use this notebook, which sports a 20GB hard drive, for gaming, and it takes DVD playback and Powerpoint in its stride.

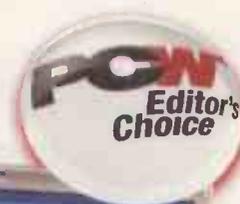
Mesh produces a near-identical notebook, the Discovery J800 14.1in Pro (not reviewed here), which is housed in the same chassis as the Evesham Voyager and uses the same processor, chipset and memory. The Mesh, however, has a 30GB hard drive.

We can find few flaws in the Voyager 5600. Perhaps the greatest is that it has no floppy drive, and Evesham charges £39 ex VAT for an accessory USB drive. That's a little mean, but the rest of the hardware is decent enough, and we feel the value for money is fair. To its credit, Evesham gives a two-year warranty and throws in two years' accidental damage insurance.

The Evesham 5600 weighs in at 3.25kg, and is a full kilogram lighter than the AJP 5600P. Despite the similar model names, they have very different chassis. We would be happy to use the Evesham as a desktop replacement, despite its slightly flexible keyboard.

The overall package is impressive and so wins our Editor's Choice award in the high-end category.

£1,000-£1,299 NOTEBOOKS



Evesham's Voyager 5600 lacks a floppy drive, but performance is good

£1,000-£1,299 NOTEBOOKS

Hi-Grade Ultinote M6400 C1700

PRICE £1,291.33 (£1,099 ex VAT) **CONTACT** Hi-Grade 020 8532 6113 www.higrade.com

PROS Good software; USB floppy drive **CONS** Sacrifices performance for spec **OVERALL** The Evesham is better

FEATURES ■■■■ **PERFORMANCE** ■■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■■ **OVERALL** ■■■■



This Hi-Grade is similar to Evesham's Voyager (above). Same chassis, different processor. Two large UK PC assemblers using the same chassis? It must be good.

Hi-Grade has opted for a 1.7GHz Celeron processor, rather than a full-on Pentium 4, but the technical differences are few and far between. The result is that the Hi-Grade demonstrated poorer performance than the Evesham, and graphics performance suffers too. If the lower performance resulted in longer battery life, we would have taken

that into consideration, but the Evesham wins on that score too. Hi-Grade offers free accidental damage insurance, but so too does Evesham.

The Ultinote includes a USB floppy drive, which would otherwise cost nearly £50 inc VAT. Hi-Grade also offers a 1.8GHz Pentium 4 model in the same chassis, but no floppy, and the price difference is also £50. Which do you value more – a floppy drive or a faster processor?

The software package should appeal to many, as it includes Microsoft Works Suite 2002.

HP zt1151

PRICE £1,299 (£1,105.53 ex VAT) **CONTACT** HP 08705 474 747 www.hp.com/uk

PROS Well-designed chassis **CONS** Poor performance and 3D graphics **OVERALL** Style may outweigh performance for some

FEATURES ■■■■ **PERFORMANCE** ■■■■

VALUE FOR MONEY ■■■■ **BATTERY LIFE** ■■■■ **OVERALL** ■■■■

We reviewed the zt1151 in our May issue and raved about its wonderful chassis. But we were less enamoured by the performance of its Celeron processor, and this month are not surprised to see that in the £1,299 group it comes last in the Sysmark test. To its credit, though, it did manage to complete all of the tests without any problems.

There is more to a notebook than its outright performance, though, and we stand by all the positive remarks we previously made. The HP package is incredibly slick and professional and

there is a small bonus in the shape of a voucher that entitles you to buy a USB floppy drive for the discounted price of £14.99 inc VAT. We would have liked to see the floppy included as standard, but £14.99 is hardly going to break the bank.

The look and feel of the HP is very good. The CD buttons, volume control, headphone socket and one USB port are in exactly the right place. The DVD/CD-RW combo drive is on the side so it can be used even when the HP is plugged into a port replicator and the touchpad is the best in the business.

£1,000-£1,299 NOTEBOOKS



Tiny Mediabook Extra 1200 CD-R

£1,000-£1,299 NOTEBOOKS



PRICE £1,299 (£1,105.53 ex VAT) **CONTACT** Tiny 0870 8303 162 www.tiny.com
PROS Chock full of ports and connectors **CONS** Sysmark and graphics performance are weak
OVERALL A good combination of features lift this Tiny above the competition

FEATURES ■■■■■	PERFORMANCE ■■■	VALUE FOR MONEY ■■■■
BATTERY LIFE ■■■■	OVERALL ■■■■	

Tiny has managed to squeeze a fair part of this notebook's specification into its rather unwieldy model name.

Mediabook covers the DVD part of the DVD/CD-RW combo drive well. Despite the poor 3D performance of the S3 Savage4 graphics chip, DVD playback is fine. The latter part of its name, 1200 CD-R, speaks volumes about the 1.2GHz Celeron processor and the CD writing capabilities of the combo drive. If it makes life easier, think of the Tiny as a 1200 combo.

The Tiny Mediabook wins a Highly Commended award almost entirely on the strength of its feature list. Its design and performance are relatively uninspired. The colour and shape are inoffensive, and construction is more passable than rugged. If we were feeling generous we would say understated and leave it at that.

That sounds picky and negative, but the worst thing we can say is that the keyboard is slightly flexible when you are typing. The 1.2GHz Celeron is comprehensively beaten in Sysmark by the Toshiba Satellite 3000's 1.06GHz Celeron. Combine that system performance with the S3 Savage 4 graphics scores and you'll appreciate that gaming isn't really an option here.

The Mediabook is a weighty 3.3kg, but you do get the full set of features inside. Clearly the combo drive adds little or no extra weight over a more basic drive, and its inclusion along with a floppy drive is very good to see. Connectivity is a very strong point indeed with this notebook, although the physical layout isn't a patch on, say, the HP zt1151.



The Tiny Mediabook stands out for its great features list

£1,000-£1,299 NOTEBOOKS

IBM R31

PRICE £1,209.08 (£1,029 ex VAT) **CONTACT** IBM 0800 015 3378 www.ibm.com/uk
PROS Ergonomics; construction **CONS** Mediocre performance and graphics **OVERALL** The poor man's entry to Thinkpad land

FEATURES ■■■	PERFORMANCE ■■■	
VALUE FOR MONEY ■■■	BATTERY LIFE ■■■■	OVERALL ■■■



Road warriors use a T or X series IBM Thinkpad and that's all there is to it. Nothing else will do, particularly if your employer is picking up the bill for the privilege, and enhancing your street credibility in the process. The R series is substantially cheaper, but you get the same look and feel, albeit with a much lower specification.

You get the usual IBM trackpoint and positive mouse buttons. More importantly, though, you get the killer matt black chassis with the usual IBM pair of catches to secure the clamshell lid.

From a short distance it looks far more expensive than it is. The R31 case may be made from ABS plastic, but it looks the part. The spec is skewed to the professional user, so you don't get Firewire or PS/2 ports, or a DVD-Rom. Gamers should look elsewhere as 3D graphics scores are also weak.

IBM loads the R31 with Windows XP Professional and a number of its own utilities, including Thinkpad configuration. If you want a floppy drive, it will set you back £46 ex VAT as an extra. In short, you get very little for your cash, but it looks great.

NEC Versa Premium

£1,000-£1,299 NOTEBOOKS

PRICE £1,251.38 (£1,065 ex VAT) **CONTACT** NEC 0870 0106 322 www.nec-online.co.uk
PROS Good connectivity **CONS** Poor performance and sound quality **OVERALL** The NEC has little to recommend it

FEATURES ■■■■■	PERFORMANCE ■■■	
VALUE FOR MONEY ■■■	BATTERY LIFE ■■■■	OVERALL ■■■

The NEC Versa Premium is a notebook that is more for the business than home user, but it is worth consideration for home office use.

There are a number of reasons for this, as a quick look at the specification will reveal. It has modem, infra-red and Lan but no Firewire. It is also one of the few notebooks in the group to have Windows XP Professional installed, rather than XP Home edition.

Battery life is at the lower end of the acceptable scale and the NEC weighs 2.45kg which is heavier than we would like. All in all it is not very portable.

It has a basic shape and is an unpleasant silver colour. Styling can work for or against a product, and here the NEC misses the mark.

The keyboard is good, but when you type on it your hands rest on the speakers. This is poor as the speakers are quiet anyway, even at full volume. The hard drive is also rather noisy and combines with the speaker position to make them almost useless. Beyond its connectivity options, the NEC has few outstanding features and is bettered in almost all areas by other notebooks in this group.



"Best Notebook of the Year 2002"

PC Advisor - M722 - Jan 02

AJP 7321 - Mid Range Notebook

- 14.1/15.1" TFT XGA (1024x768)
- AMD Athlon 4 Mobile 1600+ Processor with QuantiSpeed Technology¹ & PowerNow! Technology
- 128MB SDRAM (upgradeable to 384MB)
- 20GB HDD ATA-100 EIDE
- 8x DVD (CD-RW4 Read/Writer or Combo DVD/CD-RW4 Drive)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- Shared Video Memory 8/16/32/64MB
- Ports: 2xUSB, IrDA, TV-Out, Parallel, Serial, Monitor, PS/2
- 310(W)x266(D)x40mm(H) / Weight: 3.2Kg
- Carry Case, 24 months RTB Warranty⁴

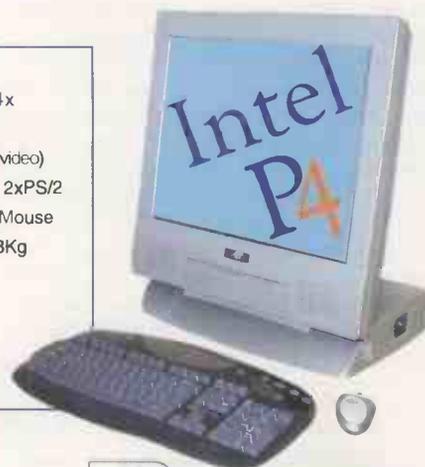
Standard Features: Built in 3.5" FDD, Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery², 5 Hot Keys (one button access to any application), Windows ME/XP Home³ with CD & Manual, Accessible World Wide Email Address



AJP Neo-PC 4 - 15.1" TFT Desktop with a Difference

- 15.1" TFT XGA (1024x768)
- 1.6GHz Intel® Pentium 4 with 512K Cache (Optional 1.8GHz/2.0GHz/2.2GHz/2.4GHz)
- 256MB DDR (upgradeable to 1GB)
- 40GB HDD ATA-100 EIDE (7200 RPM)
- 24x CD ROM (Optional 8x DVD, CD-RW4 Read/Writer or Combo DVD/CD-RW4 Drive)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI M7-P Radeon Integrated AGP 4x
- 64MB external DDR Video
- IEEE 1394 Firewire 400Mbps (for digital video)
- Ports: 4xUSB, Parallel, Serial, Monitor, 2xPS/2
- Logitech Cordless Keyboard & Optical Mouse
- 369(W)x384(D)x188mm(H) / Weight: 8.8Kg
- 24 months RTB Warranty⁴

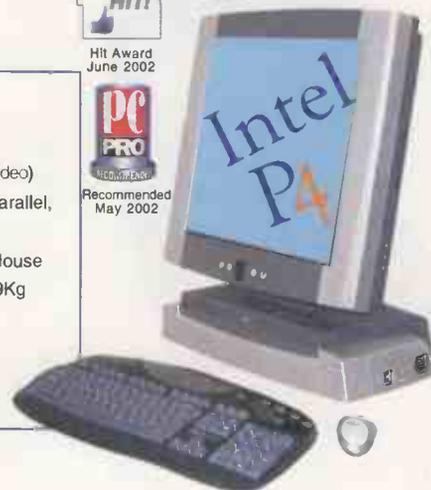
Standard Features: Built in 3.5" FDD, Built in 3D Sound & Speakers, 2x PC Card Slot, Windows ME/XP Home³ with CD & Manual, Accessible World Wide Email Address



AJP Neo-PC 4 - 17.1" TFT - Desktop with a Difference

- 17.1" TFT SXGA (1280x1024)
- 2.0GHz Intel® Pentium 4 with 512K Cache (Optional 2.2GHz/2.4GHz)
- 512MB RAMBUS (upgradeable to 2GB)
- 60GB HDD ATA-100 EIDE (7200 RPM)
- 8x DVD Drive (Bay 1)
- CDRW Read/Writer (Bay 2)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI M6-P with Integrated AGP 4x
- 64MB external DDR Video
- IEEE 1394 Firewire 400Mbps (for digital video)
- Ports: 4xUSB, IrDA, TV-Out, Video In, Parallel, Monitor, S/P DIF output
- Logitech Cordless Keyboard & Optical Mouse
- 460(W)x448(D)x220mm(H) / Weight: 13.9Kg
- 24 months RTB Warranty⁴

Standard Features: Built in 3.5" FDD, Built in 3D Sound & Speakers, 2x PC Card Slot, Windows ME/XP Home³ with CD & Manual, Accessible World Wide Email Address



Buy With Confidence:

1. Notebook Specialists, 16 years experience
2. ISO9002 Registered - Quality & Reliability
3. Value for Money
4. Excellent Magazine Reviews.
5. State of the Art Technology
6. 2-3 Days Delivery³
7. Quick & Efficient after Sales Service
8. 6 Months Interest Free Credit
9. Successful Organisation with Secure Financial Status

AJP Business Achievements

- 2002 - The Best SubNotebook of the Year, PC Advisor
- 2000 - Ranked in the top 10% of Computer Companies, Dunn & Bradstreet
- 1999 - One of the Fastest Fifty growing IT Companies in London, Deloitte & Touche
- 1999 - The Best Notebook of the Year, PC Advisor
- 1997 - The Special Achievement Award for Business, PC Direct

Recommended April 2002



Recommended March 2002



Recommended Feb 2002



Hit Award Feb 2002



Gold Xmas 2001



Best Buy Dec 2001



Best Buy Dec 2001



Business Award 1997



Buy IT Oct 2001



Commended Nov 2001



Best Buy Dec 2001



Best Buy Nov 2001



Silver Dec 2001



"Fastest Laptop Yet, Performance 6/6"

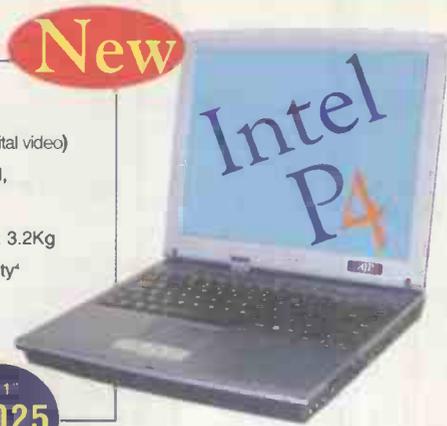
PC Pro - 5600P - June 02

AJP 620S - Mid Range Notebook

- 14.1/15.1" TFT XGA (1024x768)
- 1.6GHz Intel® Pentium 4 with 512K Cache (Optional 1.8GHz/2.0GHz/2.2GHz/2.4GHz)
- 128MB DDR (upgradeable to 1GB)
- 40GB HDD ATA-100 EIDE
- 24x CD ROM (Optional 8x DVD, CD-RW4 ReadWriter or Combo DVD/CD-RW4 Drive)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- Shared Video Memory 8/16/32/64MB
- IEEE 1394 Firewire 400Mbps (for digital video)
- Ports: 3xUSB, IrDA, TV-Out, Parallel, Monitor, S/P DIF output
- 331(W)x280(D)x44.5mm(H) / Weight: 3.2Kg
- Carry Case, 24 months RTB Warranty*

Standard Features: Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (one button access to any application), (Optional) External USB 3.5" FDD, Windows ME/XP Home*** with CD & Manual, Accessible World Wide Email Address *External USB FDD Add £49+VAT

14.1/15.1" TFT P4 1.6GHz 128MB RAM 40GB HDD CD ROM £949 +VAT £1025 +VAT

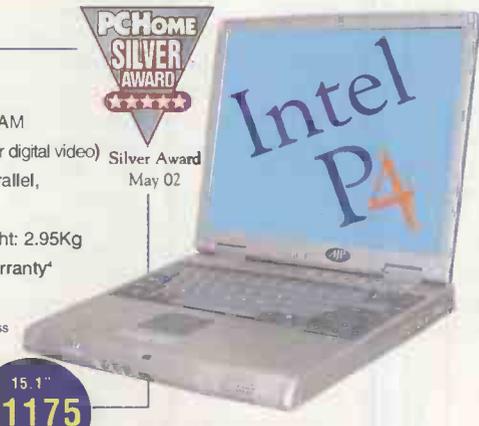


AJP 8170 - High End Notebook

- 14.1/15.1" TFT XGA (1024x768)
- 1.8GHz Intel® Pentium 4 with 512K Cache (Optional 2.0GHz/2.2GHz/2.4GHz)
- 256MB SDRAM (upgradeable to 1GB)
- 20GB HDD ATA-100 EIDE
- 8x DVD (Optional CD-RW4 ReadWriter or Combo DVD/CD-RW4 Drive)
- External USB 3.5" FDD
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI M6-P Integrated AGP 4x
- 16MB external DDR Video SGRAM
- IEEE 1394 Firewire 400Mbps (for digital video)
- Ports: 2xUSB, IrDA, TV-Out, Parallel, Monitor, S/P DIF output
- 313(W)x263(D)x36mm(H) / Weight: 2.95Kg
- Carry Case, 24 months RTB Warranty*

Standard Features: Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (one button access to any application), Windows ME/XP Home*** with CD & Manual, Accessible World Wide Email Address

14.1/15.1" TFT P4 1.8GHz 256MB RAM 20GB HDD DVD £1099 +VAT £1175 +VAT



AJP 5600P - Ultra High End Notebook

- 15.1" TFT SXGA+ (1400x1050)
- 1.8GHz Intel® Pentium 4 with 512K Cache (Optional 2.0GHz/2.2GHz/2.4GHz)
- 256MB DDR RAM (upgradeable to 1GB)
- 30GB HDD ATA-100 EIDE (Removable)
- 8x DVD (Swappable with CD ROM/CDRW/Combo)
- 3.5" FDD (Swappable with 2nd Battery/DVD/CD ROM/CDRW/Combo)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI M7-P Radeon Integrated AGP 4x
- 64MB external DDR Video
- IEEE 1394 Firewire 400Mbps (for digital video)
- Ports: 4xUSB, IrDA, TV-Out, Parallel, Monitor, PS/2, S/P DIF output
- Audio DJ onboard
- 329(W)x290(D)x44mm(H) / Weight: 3.2Kg
- Carry Case, 24 months RTB Warranty*

Standard Features: Built in 3.5" FDD, Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (one button access to any application), Windows ME/XP Home*** with CD & Manual, Accessible World Wide Email Address

15.1" TFT P4 1.8GHz 256MB RAM 30GB HDD DVD £1249 +VAT



For Additional Options Please Call



Contact Us

AJP Computers Plc
152-154 Coles Green Rd, London, NW2 7HD



SHOWROOM HOURS: MON-FRI 9.00-5.30, SAT 9.00-2.00

General: 020 8208 9700

Fax: 020 8208 9701

Customer Care: 020 8208 9788

Technical: 020 8208 9799

Email: sales@ajp.co.uk

6 Months Interest Free Credit Available*

All loans are subject to status. Written quotations on request please call Sales

*3 Years Warranty Available *Corporate Leasing

*Options & Upgrades

Processors		
Upgrade 1.6GHz to 1.8GHz.....	Add 49.00	+VAT
Upgrade 1.8GHz to 2.0GHz.....	Add 35.00	+VAT
Upgrade 1.8GHz to 2.2GHz.....	Add 75.00	+VAT
Upgrade 1.8GHz to 2.4GHz.....	Add 325.00	+VAT
HDD		
Upgrade 20GB to 30GB.....	Add 25.00	+VAT
Upgrade 20GB to 40GB.....	Add 49.00	+VAT
Additional 20GB HDD.....	Add 75.00	+VAT
Additional 30GB HDD.....	Add 99.00	+VAT
Additional 40GB HDD.....	Add 125.00	+VAT
Memory		
Upgrade 128MB to 256MB.....	Add 49.00	+VAT
Upgrade 128MB to 384MB.....	Add 75.00	+VAT
Upgrade 128MB to 512MB.....	Add 125.00	+VAT
Upgrade 256MB to 512MB.....	Add 75.00	+VAT
Optical Drive		
Upgrade CD ROM to Combo.....	Add 149.00	+VAT
Upgrade CD ROM to CDRW Drive.....	Add 79.00	+VAT
Upgrade CD ROM to DVD Drive.....	Add 49.00	+VAT
Upgrade DVD Drive to Combo.....	Add 99.00	+VAT
Upgrade DVD Drive to CD RW Drive.....	Add 25.00	+VAT
Operating System		
Upgrade to Windows XP Pro.....	Add 35.00	+VAT

Call: 020 8208 9755

Buy Online: www.ajp.co.uk

AJP™

Making IT Happen

Prices exclude delivery. Prices and specifications are subject to change without notice. All trademarks acknowledged. AJP standard terms and conditions, which are available on request, apply to all sales. E & O. E. All company details, machine specifications and general terms and conditions are also available on our web site. *Initial Purchase Only **Batteries are a consumable item and are not covered by the warranty ***Windows 98/ME available. Instead, please specify at point of sale. Please note Machines come as standard with 24Months RTB Warranty, AC/DC PSU, Carry Case and Accessible World Wide Email Address *QuantumSpeed Architecture out performs competitive seventh generation 1.6GHz processors and operates at 1.4GHz *Account is interest free if repaid in full with the 6th monthly payment. A 5% deposit is required. At the offer a 48 month finance agreement is issued at 29.8% APR. Typical example: £1,000.00 less 5% deposit; financed sum £950.00. A) For a 48 month finance agreement 48 monthly payments of £32.25, (total payable £1,598.00 APR 29.8% Variable) or B) For a 6 month INTEREST FREE finance agreement 5 monthly payments of £32.25 and the balance of £788.75 on the 6th month (total payable £950.00 APR 0%). All loans are subject to status. Written quotations available on request. AJP is a Licensed Credit Broker *2-3 working day delivery depends on stock availability and method of payment *24 Months Return to Base Warranty: initial 12 Months; Parts & Labour, following 12 Months, Labour Only.

GROUP TEST NOTEBOOKS

AJP 5600P

PRICE £1,299 (£1,105.53 ex VAT) **CONTACT** AJP 020 8208 9777 www.ajp.co.uk

PROS Massive system and graphics performance **CONS** Battery life; weight

OVERALL A desktop replacement that is more luggable than truly mobile

FEATURES ■■■■■ **PERFORMANCE** ■■■■■ **VALUE FOR MONEY** ■■■■■

BATTERY LIFE ■■■ **OVERALL** ■■■■■

The paper specification could easily fool you into thinking that the 5600P is a full desktop PC, with its 1.7GHz Pentium 4, 512MB of Ram, ATI graphics, DVD/CD-RW combo drive and so on.

Pick up the notebook and your prejudices will be reinforced. The AJP weighs a hefty 4.25kg with an extra 0.75kg for the power supply unit.

The fundamental question was whether we were looking for a portable PC or a mobile solution. We feel a notebook should be able to fulfil both roles. Unfortunately, the AJP is likely to spend the bulk of its life on a desk, as it just isn't mobile enough.

Performance aside, battery life was quite poor, and the underside gets quite warm in use. Neither is very desirable when you're using the notebook as a laptop, but these

problems don't matter very much when you're connected to the mains power and sat at a desk.

We would class this as a desktop replacement notebook with plenty of connectivity. You would be happy using the 5600P for graphics work, gaming and DVD playback. The only limitation to video editing is the relatively small hard drive.

The AJP scored four out of five for features. A serial port and a 30GB hard drive would certainly have gained it the same five out of five awarded to the Tiny.

In many respects the AJP takes precisely the opposite approach to our Editor's Choice, the Evesham Voyager 5600. But the real surprise is that two notebooks which have so little in common were so hard to separate.

£1,000-£1,299 NOTEBOOKS



Heavy though it is, the AJP 5600P has some great features

£1,000-£1,299 NOTEBOOKS



Rock Xeno

PRICE £1,291.33 (£1,099 ex VAT) **CONTACT** Rock Direct 08709 909 090 www.rockdirect.com

PROS Good performance; excellent warranty **CONS** Poor battery life **OVERALL** A good value package

FEATURES ■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **BATTERY LIFE** ■■■ **OVERALL** ■■■■■

OK, we admit it. This notebook is in the same chassis as the Evesham Voyager 5600, but inside Rock's Xeno there are some different specs.

The main difference is the 1.7GHz Pentium 4 processor rather than a 1.8GHz Pentium 4 or 1.7GHz Celeron. Our performance graphs show that this seemingly minor change in specification actually has a significant impact on the laptop's performance. The Xeno has near identical graphics performance to the Evesham, so the processor has little effect here.

In terms of battery rundown time, the Rock produced much worse performance than we achieved from the Evesham.

Rock has supplied a 30GB hard drive, and in the world of notebooks this is very generous. The chassis has no internal floppy drive and is moving towards being legacy free. As with the Evesham, a USB floppy drive is an optional extra, and Rock charges a rather steep £49 ex VAT if you want one. Its three-year warranty is also very good – we wish more manufacturers would offer the same.

Toshiba Satellite Pro 6000

PRICE £1,291.33 (£1,099 ex VAT) **CONTACT** Toshiba 01932 828 828 www.toshiba.co.uk

PROS A very well integrated product **CONS** Performance is a little weak **OVERALL** Well worth considering for road warriors

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **BATTERY LIFE** ■■■■■ **OVERALL** ■■■■■

Toshiba has managed to create a notebook that is very similar to the IBM R31. There are differences of course, but the net result is similar. The Pro 6000 uses a 1GHz Pentium III where the IBM has a 1.06GHz Celeron. Both have Windows XP Professional and neither has office software. In addition to the trackpoint, Toshiba uses crescent-shaped mouse buttons, which work well and give you a huge target area to click on.

The management software is effective, and the Toshiba console takes over a number of Windows

functions. When running on battery the notebook drops to standby after a short period of inactivity and awakens instantly. The software setup is detailed and well thought out. We liked the design too, the speakers are neatly located and the chassis feels solid.

Toshiba includes a USB floppy drive and only lets the side down by omitting Firewire. Perhaps specifying a CD-Rom is a little stingy, though. It also has a carrying case containing software CDs and modem adaptors.

£1,000-£1,299 NOTEBOOKS



"The professional's choice"

PC Pro, June 2002
Recommended

Over the last 6 months Systemax has been impressing the IT magazines again and again. Choose from our range of systems with Intel® Pentium®4 processors and you'll benefit from increased performance and get the most from your applications. To find out why our PCs win awards order your own Systemax PC today... you won't be disappointed!

VENTURE™ 5065

If you need a reliable PC that won't let you down then look no further. Network ready, a respectable 30GB hard drive and Microsoft Windows 2000 Professional will ensure you get your new business off to a flying start. Don't forget all PCs are backed by a 3 year warranty as standard.

- Systemax Prestige Midi Tower Case
- MSI SIS 645 Socket 478 Motherboard
- Intel® Pentium®4 2.0GHz Processor
- 256MB PC2100 266DDR RAM
- 30GB Ultra DMA 100 5400rpm Hard Drive
- Systemax 52x CD-ROM Drive
- 17" Systemax Monitor (16" Viewable)
- Gainward NVIDIA Vanta LT 16MB VGA Card
- On-Board Sound
- Systemax 10/100 Fast Ethernet Card
- Microsoft® Windows® 2000 Professional
- Systemax Wheel Mouse
- Systemax PS/2 Keyboard with Web Hotkeys
- 3.5" 1.44MB Floppy Drive
- McAfee Virus Scan V6
- Systemax 1 year On-site Warranty, 2 years RTB

Intel® Pentium®4 2.0GHz Processor



CODE: 54777

£699

EX VAT

£821.³³

INC VAT

BUILD TO ORDER OPTIONS

You can choose from Systemax's recommended configurations, or if you prefer you can customise a Systemax PC on our web-site. This allows you to select the processor, memory, hard drive and any other variables you wish to change in order to customise your own PC.

AWARD WINNING PCS

Computer Shopper – June 2002
Best Buy – PC Extremes – Inspire A2100CS

"Data can be read or written concurrently on two IDE channels offering significant benefits. The Inspire is one of only two systems to include a DVD-RAM/R-drive, which allows 4.7GB of removable storage. An Ethernet adaptor, Firewire, 56K modem and CD-RW complete the feature-rich configuration."

PC Pro – June 2002
Recommended – Reliance P2400CP

"The professional's choice of Pentium 4 machine. This PC offers incredibly fast performance, buckets of hard disk space and a respectable all-round feature set."

PC Pro – June 2002
Recommended Entry Level Servers – Mission P1000CP

"The Mission P1000CP delivers a fine specification for the price and packs it all into a sleek black chassis with tons of expansion potential. The SuperMicro P3TDL3 motherboard looks a fine choice, as its server-specific and comes with the ubiquitous ServerWorks chipset."

PCW – June 2002
Editors Choice – Inspire A1900CX

"Systemax has gone the extra mile here, supplying the extra connectors for six-channel sound, as well as digital output, which is handy if you feel like upgrading the Systemax a later stage."

FUSION 5000



- Intel® Pentium®4 1.8GHz Processor
- 256MB PC2100 266DDR RAM
- 40GB Ultra DMA 100 7200rpm
- Gainward NVIDIA GeForce4 MX420 64MB DDR VGA Card with TV-Out
- Videologic ZXR-500 5.1 Surround Sound Speakers
- Hauppauge WinTV-GO TV-Tuner Card
- Systemax 16x DVD-ROM Drive
- Systemax 32x10x40 Burnproof CD-RW
- Please call for full specification



CODE: 54775

£999

EX VAT

£1173.⁸³

INC VAT

TRAVELBOOK 4000V



- Intel® Pentium®4 1.6GHz Processor
- 256MB PC133 RAM
- 30GB Ultra DMA 100 5400rpm Hard Drive
- Systemax DVD-ROM Drive
- 14.1" XGA TFT Display
- 16MB ATI Mobility M6-D 16MB VGA
- Built-in 10/100 LAN and 56K Modem
- Approximate battery life of 3 hours
- Please call for full specification



CODE: 54603

£1049

EX VAT

£1232.⁵⁸

INC VAT

Systemax PCs use genuine Windows® Operating Systems visit
www.microsoft.com/piracy/howtotell

Intel, Intel Inside logo and Pentium are registered trademarks and Xeon is a trademark of Intel Corporation. Windows® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. The photographed products are for illustration purposes only. Prices are correct at time of going to press and are subject to change without notice. Prices quoted Ex Delivery Ask for delivery charge details at time of purchase. E&OE

Systemax Authorised Resellers

order online at www.systemaxpc.co.uk

GLOBALdirect 0870 729 2156
MISCO 0870 728 4112
SIMPLY 0870 720 0673

Systemax™
Get a whole lot more!



Make a name for yourself on the Internet

It only takes a few clicks

Register your own domain name today

.co.uk
domain names
£5.00 per year
excluding VAT

.com/.net/.org
domain names
£9.00 per year
excluding VAT

.biz/.info
domain names
£10.00 per year
excluding VAT

UK domains can only be registered for 2 years at a time whilst all other domains can be registered for between 2 and 10 years

There are no hidden charges - All prices include set up and registry fees

All domains include the following FREE services / features

Unlimited email addresses

Unlimited POP3 mail boxes

Unlimited auto responders

Unlimited multirecipient addresses

Unlimited web forwarding

Domain parking

Personal control panel

Search engine submission

SPAM filtering

Email virus scanning

Online knowledge base

Technical support via email

If you need web space for your domain you can choose from one of our web hosting solutions starting at just £12.00 per year excluding VAT

Take the first step

VISIT US TODAY @
www.me2uweb.com

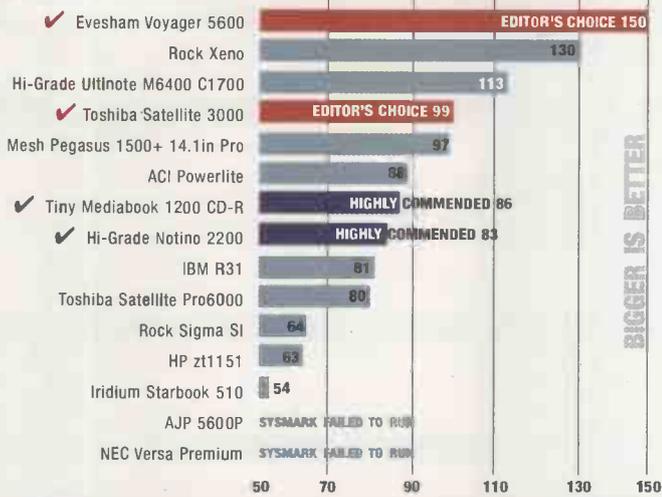


me2uweb

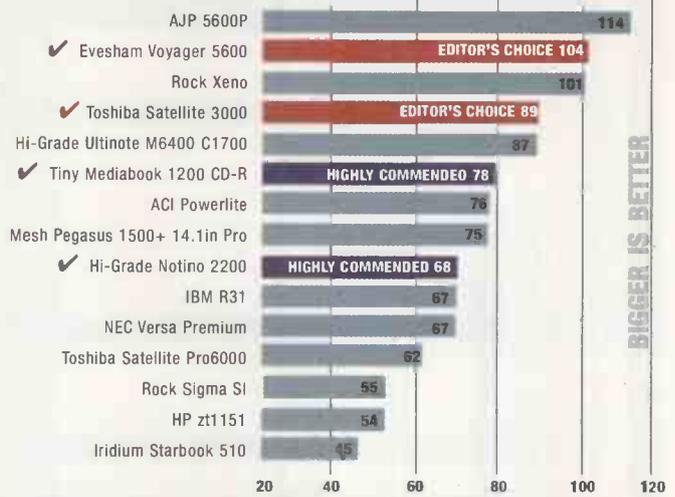
Domain name registration and web hosting solutions

LAB RESULTS

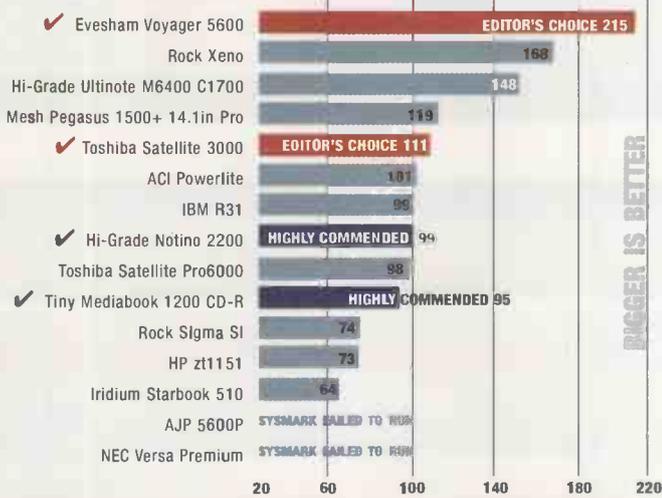
Sysmark 2001 overall



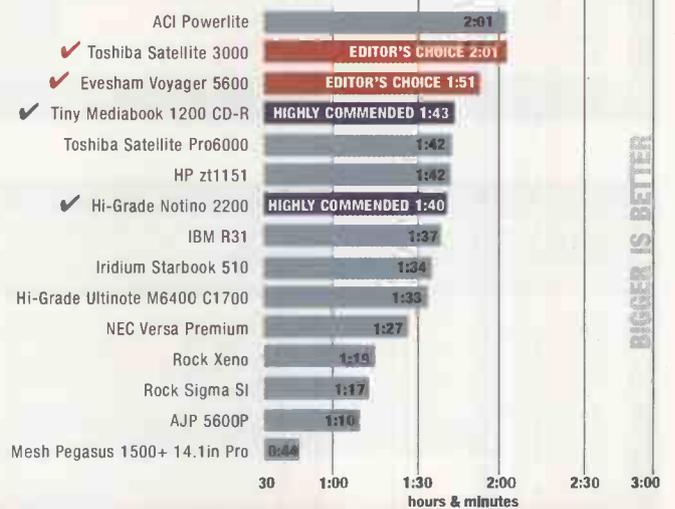
Sysmark 2001 office productivity



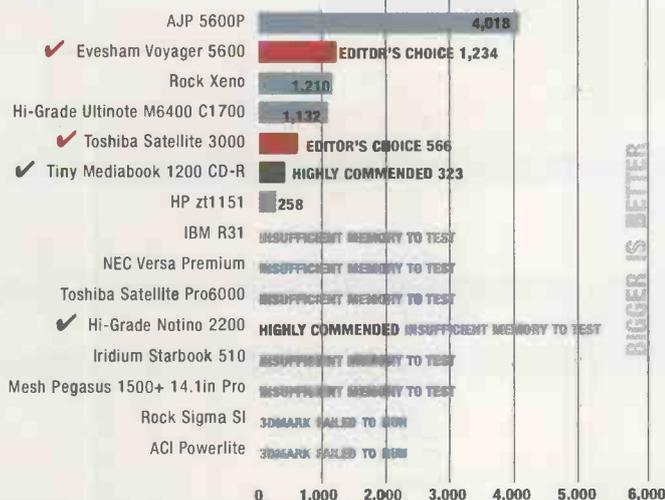
Sysmark 2001 Internet content creation



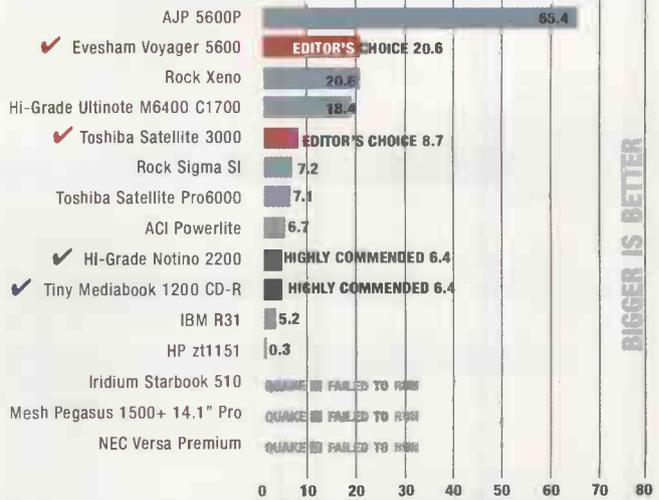
Battery life



3Dmark 2001 (1,280 x 1,024 at 32bit)



Quake III Team Arena (fps) (1,280 x 1,024 at 32bit)



Please see page 42 for an explanation of how we tested the notebooks

TABLE OF FEATURES



NOTEBOOKS UNDER £999

MANUFACTURER	HI-GRADE	IRIDIUM	MESH
MODEL NAME	NOTINO 2200	STARBOOK 510	PEGASUS 1500+ 14.1IN PRO
Price inc VAT (ex VAT)	£999 (£850.21)	£938.83 (£799)	£999 (£850.21)
Sales telephone	020 8532 6113	0870 0660 222	020 8208 4706
URL	www.higrade.com	www.iridium-uk.com	www.meshcomputers.com
HARDWARE SPECS			
Processor	Intel 1.06GHz Celeron	Intel 1GHz Celeron	AMD Athlon 4 1500+
Chipset	SIS630	SIS 630	Via
Memory	112MB	120MB	120MB
Max memory in this configuration	368MB	632MB	256MB
Hard disk size/transfer rate (UltraDMA66/100)	20GB UltraDMA100	20GB UltraDMA100	20GB UltraDMA100
Touchpad or trackpoint	Touchpad	Touchpad	Touchpad
No of USB/Firewire/serial/parallel/PS/2	3/1/0/1/0	2/1/0/1/1	2/0/1/1/1
Modem/Lan/intra-red/PC Card slots	✓/✓/✓/1	✓/✓/✓/1	✓/✓/✓/2
MULTIMEDIA			
Optical drive/floppy drive	DVD-Rom/USB	DVD-Rom/Internal	DVD-Rom/Internal
Sound chip	SIS 7018	SIS 7018	Crystal WDM
Graphics chip/memory	SIS 630/16MB	SIS 630/8MB	S3 Savage4/8MB
Screen size/maximum resolution	12.1in/1,024 x 768	14.1in/1,024 x 768	14.1in/1,024 x 768
OTHER INFORMATION			
Bundled software	Microsoft Works 6, Norton Antivirus	WinDVD, McAfee Virus Scan	WinDVD, Lotus SmartSuite 9.7
Standard warranty (RTB = return to base, C&R = collect and return)	2yrs RTB	1yr C&R	2yrs RTB
SCORES			
Features			
Performance			
Value for money			
Battery life			
Overall			

TABLE OF FEATURES

£1,000-£1,299 NOTEBOOKS

MANUFACTURER	HI-GRADE	HP	IBM
MODEL NAME	ULTINOTE M6400 C1700	ZT1151	R31
Price inc VAT (ex VAT)	£1,291.33 (£1,099)	£1,299 (£1,105.53)	£1,209.08 (£1,029)
Sales telephone	020 8532 6113	08705 474 747	0800 015 3378
URL	www.higrade.com	www.hp.com/uk	www.ibm.com/uk
HARDWARE SPECS			
Processor	Intel Celeron 1.7GHz	Intel 1.06GHz Celeron	Intel 1.06GHz Celeron
Chipset	Intel 845	Via	Intel 830M
Memory	256MB	240MB	120MB
Max memory in this configuration	512MB	496MB	632MB
Hard disk size/transfer rate (UltraDMA66/100)	20GB UltraDMA100	20GB UltraDMA100	20GB UltraDMA100
Touchpad or trackpoint	Touchpad	Touchpad	Trackpoint
No of USB/Firewire/serial/parallel/PS/2	2/1/0/1/0	3/1/0/1/0	2/0/0/1/0
Modem/Lan/intra-red/PC Card slots	✓/✓/✓/1	✓/✓/✓/2	✓/✓/✓/1
MULTIMEDIA			
Optical drive/floppy drive	DVD-Rom/USB	DVD/CD-RW combo/X (see review)	CD-Rom/X (see review)
Sound chip	Avance AC97	Via AC97	Soundmax
Graphics chip/memory	ATI Mobility Radeon/16MB	S3 Savage4/16MB	Intel 830M/8MB
Screen size/maximum resolution	14.1in/1,024 x 768	15in/1,024 x 768	14.1in/1,024 x 768
OTHER INFORMATION			
Bundled software	PowerDVD, MS Works Suite 2002, McAfee Antivirus	Microsoft Works Suite 2002	Norton Antivirus, PC Doctor
Standard warranty (RTB = return to base, C&R = collect and return)	2yrs RTB	1yr RTB	1yr RTB
SCORES			
Features			
Performance			
Value for money			
Battery life			
Overall			

NOTEBOOKS GROUP TEST



£1,000-£1,299 NOTEBOOKS

ROCK SIGMA S1	TOSHIBA SATELLITE 3000	ACI POWERLITE	AJP 5600P	EVESHAM VOYAGER 5600
£997.58 (£849)	£999 (£850.23)	£1,287 (£1,095.32)	£1,299 (£1,105.53)	£1,291.33 (£1,099)
0870 9909 090	01932 828 828	020 8357 1116	020 8208 9777	0870 160 9500
www.rockdirect.com	www.toshiba.co.uk	www.aciplc.com	www.ajp.co.uk	www.evesham.com
Intel 1GHz Pentium III SIS 630S 240MB 752MB 20GB UltraDMA100 Touchpad 2/1/0/1/1 ✓/✓/✓/1	Intel 1.06GHz Celeron Intel 830M 248MB 504MB 20GB UltraDMA66 Touchpad 3/0/0/1/0 ✓/X/✓/2	Intel 1GHz Pentium III mobile SIS 630S 184MB 640MB 20GB UltraDMA100 Touchpad 2/0/1/1/0 ✓/✓/✓/1	Intel 1.7GHz Pentium 4 Intel 845 512MB 512MB 20GB UltraDMA100 Touchpad 4/1/0/1/1 ✓/✓/✓/1	Intel 1.8GHz Pentium 4 Intel 845 256MB 512MB 20GB UltraDMA100 Touchpad 2/1/0/1/0 ✓/✓/✓/1
CD-Rom/internal SIS 7018 SIS 630/16MB 14.1in/1,024 x 768	DVD-Rom/X Crystal WDM Intel 830M/8MB 14.1in/1,024 x 768	CD-Rom/USB SIS 7018 SIS 630 13.3in/1,024 x 768	DVD/CD-RW combo/internal Avance AC97 Mobility Radeon 7500/64MB 15in/1,400 x 1,050	DVD-Rom/X (see review) Avance AC97 ATI Mobility Radeon/16MB DDR 14.1in/1,024x768
McAfee Virus Scan 1yr C&R	WinDVD, Microsoft Works 6 1yr RTB	Lotus SmartSuite Millennium 1yr C&R, lifetime labour & tech support	WinDVD 1yr RTB	Power DVD, Big Fix, Sun Star Office 2yrs RTB, 2yrs accidental damage insurance



NEC VERSA PREMIUM	ROCK XENO	TINY MEDIABOOK EXTRA 1200 CD-R	TOSHIBA SATELLITE PRO 6000
£1,251.38 (£1,065)	£1,291.33 (£1,099)	£1,299 (£1,105.53)	£1,291.33 (£1,099)
0870 0106 322	08709 909 090	0870 8303 162	01932 828 828
www.nec-online.co.uk	www.rockdirect.com	www.tiny.com	www.toshiba.co.uk
Intel 1.2GHz Pentium III SIS 112MB 384MB 20GB UltraDMA100 Touchpad 2/0/1/1/1 ✓/✓/✓/2	Intel 1.7GHz Pentium 4 Intel 845 256MB 768MB 30GB UltraDMA100 Touchpad 2/1/0/1/0 ✓/✓/✓/1	Intel 1.2GHz Celeron Via Twister 224MB 480MB 30GB UltraDMA100 Touchpad 2/1/1/1/1 ✓/✓/✓/2	Intel 1.0GHz Pentium III mobile Ali Nappa 2 112MB 624MB 20GB UltraDMA100 Trackpoint 2/0/1/1/1 ✓/✓/✓/2
DVD/CD-RW combo/internal SIS 7018 SIS 630/16MB 14.1in/1,024 x 768	DVD-Rom/X (see review) Intel AC97 ATI Mobility Radeon/16MB 14.1in/1,024 x 768	DVD/CD-RW combo/internal Soundmax S3 Savage4/32MB 14.1in/1,024 x 768	CD-Rom/USB Ali Trident Cyberblade XP/16MB 14.1in/1,024 x 768
Norton Antivirus, Prassi PnmoDVD 1yr C&R	WinDVD, McAfee Virus Scan 3yrs C&R	PowerDVD 1yr C&R	Sophos Antivirus, Toshiba Utilities 1yr RTB

When we sent out the invitation for this group test, we were very liberal with the specification. We required an optical drive so we could load testing software, and Windows XP – either Home or Professional version. We set two price points; up to £999 and £1,000-£1,299 including VAT to attract a representative sample of the market.

A glance at the features table shows that we got a fair variety of hardware, although there are some common components. Most of the screens are 14.1in with a resolution of 1,024 x 768 and hard drives were all 20GB with the sole exception of the 30GB in the Rock, Tiny and Mesh entrants at the upper end of the scale. We saw a variety of processors including Pentium 4, Pentium III, Celeron and Athlon 4. On the graphics side of things we received notebooks that included chips from SIS, Intel, ATI and S3, but none from Nvidia.

We tested the notebooks with our regular benchmarks, namely Sysmark 2002, 3Dmark 2001, Quake III Team Arena and our own battery test. We ran the graphics tests at a resolution of 1,024 x 768 rather than the usual 1,280 x 1,024 to ensure a common testing platform.

We had problems running Sysmark on a few of the notebooks, particularly in the intensive Internet content creation multimedia arena. We suspect that the issue was one of heat generation and dispersal in the cramped confines of the chassis.

There is often a direct trade-off between battery life and the speed and graphics performance of a notebook. However, the days are gone when a full-power desktop replacement notebook had a short battery life and the only way to get a decent battery life was to get a low-speed processor and a small amount of memory. It is possible now to get high performance and a long battery life for a reasonable price.

The winners

In the £999 price bracket we gave our **Editor's Choice** award to the **Toshiba Satellite 3000**. Clearly Toshiba has done something special with this notebook, as the performance is significantly better than we would expect, going on the specification alone. We can only think that the Intel 830M

chipset boosts the Celeron 1.06GHz processor to unnatural heights, and frankly we love it.

The rest of the Toshiba package is less spectacular, but it's still good stuff. Battery life sneaks past two hours and the software package is respectable. What you don't see in the features table is all the little bits and pieces that come with every Toshiba, like a quality carrying bag. The only other notebook with a similar level of completeness is the IBM R31. The Toshiba 3000 outperforms that same IBM and costs £200 less – a worthy winner.

Our **Highly Commended** award goes to **Hi-Grade** for the **Notino 2200**. It's a cute little beast with a small form factor and 12.1in screen. You probably wouldn't replace your desktop PC with the Notino, but you'd be happy using it on the move.

Performance is good, as is everything else, but not outstanding: the Notino scored three out of five in each category. Its strength is its look and feel – Hi-Grade has packaged a very slick consumer product.

In the up-to-£1,299 group our **Editor's Choice** is the **Evesham 5600**. It features a 1.8GHz Pentium 4 to provide a huge amount of raw power. It has very few weak areas and outperforms relatively young PCs. We were impressed by the balance of system performance, graphics and battery life. It's not quite as polished as the Toshiba or IBM, but you get a lot of hardware for your money.

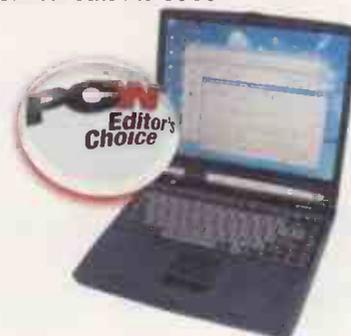
The **Tiny Mediabook** was the only notebook here to score five out of five, which was awarded for features, and so we gave it the **Highly Commended** award in the high-end category. It's got everything. You get all the connectivity you are likely to need, as well as a 30GB hard drive and a combo CD-RW/DVD drive. Although the performance isn't breathtaking, the Mediabook Extra 1200 CD-R finished all the tests without problem and battery life is just good enough to allow you to watch most DVD movies.

We did some soul searching over the **Also Consider** award which we gave to the **AJP 5600P**. It wouldn't complete Sysmark, which is a bit of a concern. It uses a desktop processor which means it runs relatively hot. It is a desktop replacement with monstrous processing power and gaming-quality graphics. It even has 512MB of memory.

The Evesham 5600 provides a huge amount of raw power

NOTEBOOKS UNDER £999

Toshiba Satellite 3000

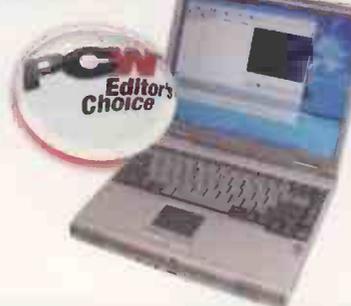


Hi-Grade Notino 2200



£1,000-£1,299 NOTEBOOKS

Evesham 5600



Tiny Mediabook Extra 1200 CD-R



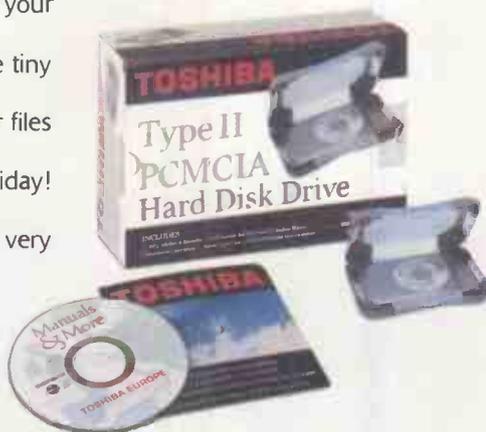
Working from home this weekend?

2GB SPECIAL OFFER



Work where you want to, not where you have to!

Take the data with you, not the device. The sensational Toshiba PC Card portable hard disk drives enable you to slip your work into your shirt pocket. A fraction the size of a notebook, yet with massive capacity of up to 5GB for storing all your important data, a PC Card drive lets you store files in one tiny place rather like a digital wallet. So wherever you are, your files are, too. Whether it's at home, at the office or even on holiday! And now the 2GB capacity PC Card is available at a very special low price! Call now or visit our comprehensive website for more details. But you'd better be quick, this offer is available for a limited time only.



expansys

**dabs
com**

TOSHIBA

UK: FREEPHONE 0800 169 4527. Ireland: FREEPHONE 1800 200 613.

Fax: 003531 813 1653. Email: SDDdirect@toshiba-teg.com

www.toshiba-europe.com/storage



WORDS: NIK RAWLINSON PICTURES: BRUCE MACKIE & NIK RAWLINSON

Digicam delights

It's now possible to get top-quality pictures from pocket-sized digital cameras without breaking the bank. We've put eight leading snappers through their paces

CONTENTS

- 124 Canon Powershot A40
- Epson PhotoPC 2100Z
- 125 HP Photosmart 715
- Kodak DX3600 Zoom
- 126 Nikon Coolpix 2500
- Olympus Camedia C-220 Zoom
- 131 Ricoh Caplio RR120
- Sony Cybershot DSC-P50
- 132 Table of features
- 133 Editor's Choice

W

ith summer well and truly upon us – as far as the calendar is concerned – it's time to get out and take pictures of the family, the countryside and the dog. It was once true that this meant a trip to the chemist to buy film and, depending on the age of your camera, a fresh set

of flash bulbs, but with the price of digital cameras dropping about as quickly as everything else computer related that's no longer necessary.

PCW has gathered together eight key players in the digital camera market, taking one budget model from each. With resolutions of between 2 and 3.3 megapixels, they are more than up to the job of replacing your existing film camera, and with online photo printing services now rivalling conventional silver-halide processes there is no reason for your film-favouring friends to know you've bitten the binary bullet. You'll also find that each camera easily connects to your PC, so you'll be able to download, upload and edit your pics to your heart's content.

We tested each camera in a range of environments and in various lighting conditions, reproducing an image from each beside the relevant review. As ever, be aware that the magazine printing process may alter the colour balance in each photo, so these should be used to examine resolution and compression only.

As each of these cameras is about half the price you would have paid for a model of this quality a few years ago, we also wanted to know if lower prices equated to lower quality. There was only one way to find out... 

GROUP TEST DIGITAL CAMERAS

Canon Powershot A40

PRICE £299 (£254.47 exVAT) **CONTACT** Canon 0800 616 417 www.canon.co.uk

PROS Versatile **CONS** A little pricey

OVERALL Would suit beginners and experts alike – you get what you pay for

OVERALL SCORE ■■■■■

Well-balanced and comfortable to hold, the Powershot A40 is Canon's entry-level 2megapixel offering. Its styling and operation is very similar to the rest of Canon's range, but lacks the superior feel of the higher-end products. It is powered by four AA batteries and features both an optical viewfinder and a 1.5in LCD. The flash can be set to on, off, auto, fill-in or red-eye reduction mode. The lens, meanwhile, has an impressive focal length equivalent to 35-105mm on a regular 35mm camera, making it roughly equivalent to the HP, yet in a far smaller body.

The 3x optical zoom is supplemented by a 2.5x digital function, for a total zoom of 7.5x, while the macro mode will take you as close as 16-76cm, which is one of the best in the group test.

The A40 has three resolution settings: 1,600 x 1,200, 1,024 x 768 and 640 x 480 and stores images on a bundled 8MB Type I Compact Flash (CF) card. Additional shooting modes

record movies, with sound, at 320 x 240 and 160 x 120 pixels, or panoramic images that can be stitched together using the software included in the box.

A button on the front of the body allows a front-mounted ring to be unscrewed, making room for supplementary lenses, which, combined with the fact that either nothing or practically everything can be set to manual, makes this one of the most versatile cameras on test.

The Canon produced some of the most realistic reds in our flower bed test. There was also good focus across the whole image, giving a very pleasing overall effect. Like the Kodak, it also performed very well in our interior detail shot. Under strip lighting, white pages in our dictionary were rendered white, and details in the corners of the image were captured cleanly. Clear plastic objects picked up both light and colour reflected from other objects. Very impressive indeed.



Epson PhotoPC 2100Z

PRICE £305.53 (£260.05 exVAT) **CONTACT** Epson 0800 220 546 www.epson.co.uk

PROS Quiet; good detail capture **CONS** Pricey; charger is optional extra

OVERALL Easy to use; great for the beginner

OVERALL SCORE ■■■■



Very much the plain-Jane entrant, the 2.3megapixel (3.1megapixel with hardware interpolation) 2100Z feels rather over-sized in proportion to its external functionality. Like the Kodak, it is switched on by flipping the lens cover to one side. The lens is equivalent to a 35-70mm component on a regular 35mm camera, which is a little disappointing as the difference between telephoto and wide-angle photos is weaker than others in the test. However, it is very quiet. The macro is a little weak, closing in to only 30-50cm. Sensitivity is set automatically to either 100 or 200 ISO, and focus is handled by the 2100Z.

The 1.6in LCD is supplemented by an optical viewfinder, without manual adjustment. The on-screen menu is small and fiddly, and not up to the standard of Epson's high-end cameras – a shame considering that porting a subset of the OS should not add to the cost. A neat feature is the border around the LCD image, which turns yellow to warn when you stray

into digital zoom territory (the limits are 2x optical, 2.5x digital).

The three quality settings are: Hypic (2,160 x 1,440), Print (1,800 x 1,200) and email (720 x 480), giving this camera a friendly face. Using the supplied 8MB Type I Compact Flash card, you'll be able to store 11, 16 and 117 photos respectively.

A bonus addition is the copy of MGI Photosuite III SE included in the box – branded software is less common at this end of the price scale.

The 2100Z produced fairly muted colours in our flower bed test. The red tulips lacked the vibrancy of those captured by the Canon and Olympus, and there was a touch of orange to the yellow flowers.

Like the HP, the 2100Z also erred slightly towards the shadows when used under strip lighting. However, it did produce sharp images and detail was good. Right into the corners of the picture, small words in a dictionary and fur on a child's toy were realistic and well captured.

HP Photosmart 715

PRICE £349 (£297.02 ex VAT) **CONTACT** HP 08705 474 747 www.hp.com/uk

PROS Versatile; high resolution **CONS** Bulky; expensive

OVERALL Will deliver the biggest prints in the group, but at a price

OVERALL SCORE ■■■■■

Easily the biggest of the cameras, the 3.3megapixel Photosmart 715 also has the highest resolution. It is not only long and tall, it is also wide, courtesy of a deep lens arrangement. This gives it the benefit of one of the widest focal length ranges, equivalent to between 32mm and 102mm on a conventional 35mm camera, covering the ground between telephoto and wide-angle.

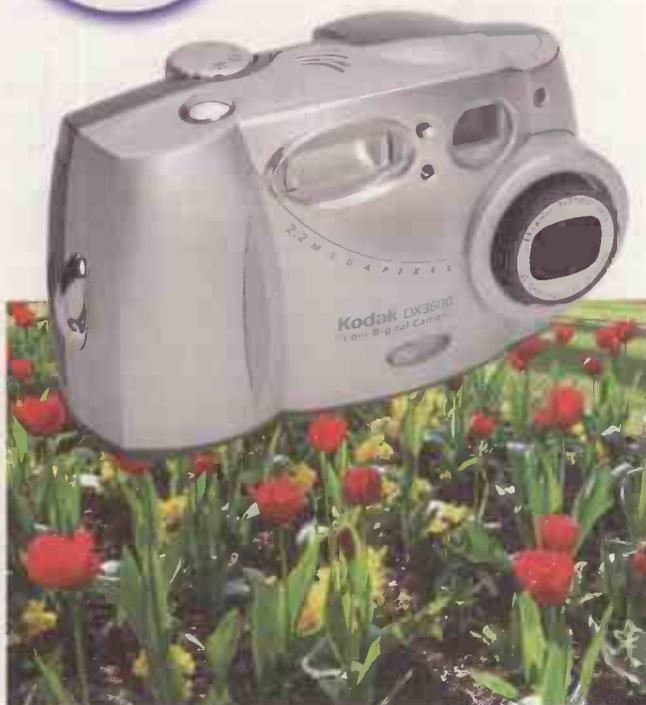
Like many budget cameras, it runs on four AA batteries (supplied) and has a power input point, while the 1.8in LCD is backed up by an optical viewfinder with dioptre so it can be tweaked to suit your eyes. Pictures are stored on Type I Compact Flash and you should squeeze around 10 2,048 x 1,536 pixel shots onto the supplied 16MB card. Upping the compression increases this to 20, while dropping the resolution to 640 x 480 should give you space for 162. This camera is the very essence of point and shoot, with automatic focus and exposure, and sensitivity fixed at

100 ISO. The flash can be set to on, off, red-eye reduction or automatic and there is a 10-second self timer.

A macro mode will focus on anything between 20 and 60cm away, which is fairly average. Looking further afield, the 715 benefits from a 3x optical zoom, supplemented by a 2x digital zoom. The simplistic menus, meanwhile, seem well-pitched for the first-time user.

The HP performed moderately well in use. In some instances, bright areas of a sunny flower bed appeared more exposed than the same image produced by other cameras, such as the Kodak and Olympus. However, some red tulips were also markedly more vibrant than those produced by other cameras in the test.

Under overhead strip lighting, used to simulate the environment in which many of these cameras will be used, its output was a little subdued. White surfaces came out slightly dirty in comparison to the competition, but on the whole the image was sharp.



Kodak DX3600 Zoom

PRICE £249 (£211.91 ex VAT) **CONTACT** Kodak 0870 243 0270 www.kodak.co.uk

PROS Great interior shots **CONS** Dock may not appeal to all

OVERALL A competent and versatile submission

OVERALL SCORE ■■■■■

The Kodak is unique here for connecting to the PC by means of a docking station, which simultaneously recharges the battery. Should you run out of juice while out and about, this battery pack can be replaced by two standard AA cells.

This 2.2megapixel device features a 2x optical zoom, 3x digital zoom and a lens rated at the equivalent of 35-70mm on a regular 35mm camera. This is the same as the Epson and is not particularly impressive, much like the uncomfortable and rather over-sensitive rocker that controls the zoom. There is a 30mm thread for optional extra lenses, though, so if you're willing to spend a bit more you can upgrade the device. The macro mode is a fairly ordinary 28-60cm.

The DX3600 is the only camera tested here to have 8MB of built-in memory, which can be supplemented through the insertion of a Type I Compact Flash card. To the rear, the 1.6in LCD supplements the optical

viewfinder and provides a home to the basic menu system. There are two resolution settings, offering 1,800 x 1,200 or 900 x 600 pixels. This is a 3:2 aspect ratio, which more closely resembles a traditional film-based photo. Movies can also be shot at 320 x 240 or 160 x 120, like many other movie-enabled cameras.

The DX3600 picked up yellows particularly well in our flower bed test. The red tulips were creeping slightly towards scarlet, though, and lacked the realism of those produced by the Olympus. The range of colour in the green spectrum, however, was impressive, with particularly good definition between light and shade.

The Kodak was the best of the bunch in our interior detail shot. Although we were using strip lighting, whites came out truly white and right into the corner small details were clearly captured. Indeed, it was so good that we even had to check the Exif picture data to ensure the flash had not fired during testing.

GROUP TEST DIGITAL CAMERAS

Nikon Coolpix 2500

PRICE £299.99 (£255.31 ex VAT) **CONTACT** Nikon 0800 230 220 www.nikon.co.uk

PROS Small; good images **CONS** Poor body design

OVERALL Good internals let down by a poorly designed body

OVERALL SCORE ■■■■

The 2megapixel Coolpix 2500 is a smart looking device. It is small, blue, and has some of the simplest controls of the group. In common with other Nikon cameras the lens section of the body must be twisted, allowing you to take pictures over the top of a crowd, making it great for concerts. Unfortunately, in this instance your fingers get stuck inside the casing and you invariably end up pressing your thumb on the lens.

It has four resolution settings: 1,600 x 1,200, 1,280 x 1,024, 1,024 x 768 and 640 x 480, and three compression levels, giving you room for between eight and 113 images on the bundled 16MB Type I Compact Flash card. A handy 'small picture' button automatically copies smaller sizes of images for emailing. Exposure compensation can be set between +/-2EV in 0.3EV steps. It is also Print Image Matching (Pim) compliant, so has 12 image type settings to optimise images for printing on an Epson inkjet, while the flash

can be set to on, off, auto, slow sync or red-eye reduction modes. The lens is equivalent to 37-111mm on a conventional 35mm camera. This is one of the best ranges in the group. It has a 3x optical zoom (4x digital) and can take you to as close as 4cm for macro photography. The 2500 is powered by a slimline rechargeable battery.

Like the HP Photosmart, this Coolpix demonstrated slight higher exposure of the yellow flowers in our test. The red tulips, however, were very realistic. Edges were crisp and tonal variation within green foliage was well differentiated.

The Coolpix performed well in our interior detail test. Even without the flash, and under strip lighting, white pages of a dictionary were captured as white, and there was fair detail in the corners and edges of the image. Like the Kodak, it made the best of the available light and the resulting picture was almost as good as one taken using a flash, putting it on a par with the Canon.



Olympus Camedia C-220 Zoom

PRICE £199.99 (£170.20 ex VAT) **CONTACT** Olympus 0800 072 0070 www.olympus.co.uk

PROS Good Images; small; very affordable **CONS** Clumsy lens cover

OVERALL Looks good, as do its images, and is great value

OVERALL SCORE ■■■■



Slim and attractive, the 2megapixel C-220 will easily slip into any pocket or bag. Unfortunately, it's rather keen to get on with business and in our tests the lens cover frequently slipped open as it travelled around with us, exposing the lens and popping out the flash.

Shutting it down is a rather clumsy operation, requiring that you push the cover into the lens and leave it there until the unit retracts far enough for you to pass it across. It is, however, a well-balanced body and feels good in your hand.

To the rear, a 1.5in LCD screen supplements the regular optical viewfinder. This is bright and clear, and easy to use in most lighting conditions, but has a slow refresh and is not turned on by default. There is an almost unprecedented range of six flash settings.

The C-220 runs on two standard AA batteries and saves images to an 8MB Smart Media card. With resolution options of 1,600 x 1,200, 1,024 x

768 and 640 x 480 it can fit between five and 49 shots onto the media.

The lens is equivalent to a 35-114mm unit on a conventional 35mm camera. It features a 3x optical and 2.5x digital zoom, which equates to 7.5x in total.

The control for this sits on top of the body. It is small and unpleasant to use, but effective enough. The macro mode, meanwhile, takes you to between 20cm and 50cm.

The Olympus performed well in our flower bed test, producing a good range of colours, particularly among the yellow flowers. Red tulips were vivid and realistic, while tonal variation among the green foliage was well differentiated. Like the Sony, saturation was slightly higher than the rest of the group.

It produced some good detail in our interior shots. Under strip lighting, corners and edges of the image were clean, although the luminance was not quite up to the standard achieved by Kodak, Nikon or Canon.

Microsoft Works Suite 2002
Works Suite 2002 combines six complete products, including the latest and complete version of Microsoft Word, for one great value price. The Works Task Launcher brings all of these home software applications and online resources to you based on what task you need to get done. Works Suite is the easiest way to get and use all the software you really need for your home PC.

Only **£73.99**
£86.94 inc. vat

Ask for item# E356813

Samsung SM151S
From only **£289.99**
£340.74 inc. vat

Ask for item# E378086

- Samsung SM151S**
- 15" TFT LCD
 - Resolution up to 1024x768
 - 300:1 Contrast Ratio
 - 16.7 Million Colours
 - VESA Mount Compatible
 - Pivot, Angle & Height Adjustable Stand.
 - 3 year On-Site Warranty

Norton Systemworks V5 2002
This suite includes the following products:
Norton Antivirus
Norton Utilities
Norton Cleansweep
Go Back

XP Compatible

£45.99
£54.04 inc. vat

Ask for item# E364633

Viking Compact Flash
*does not include reader pictured

- Wide range of CompactFlash™ and SmartMedia™ cards and readers
- Extensive warranty programme
- Built to OEM specifications
- Guaranteed 100% compatible

From only **£19.99**
£23.49 inc. vat

Ask for item# E294725

Viking 32MB Compact Flash E294725 £22.99 (£27.01)

Free!

Call now to receive our catalogue jam-packed with the latest computer hardware, software and networking products for home and office.

Britain's computer technology experts for over 30 years!

Technomatic®

Hardware, software and networking all in **one call.**

Fast and accurate shipments for **Next Day delivery.**

Experienced **Trouble-free Tech Support** experts.

Access to the very **Latest Lab Test Products.**

The convenience of 6-month **0% Financing.**

Technomatic® - Britain's computer technology experts for over 30 years!

QuarkXPress 5.0
NEW VERSION!

QuarkXPress provides the tools you need for cross-media publishing. New version 5.0 enables you to command every aspect of your document, from conception to output.

Upgrade For Only **£323.99**
£380.59 inc. vat

Ask for item# E407934 (Upg from v4.x to 5.0)

Microsoft® Flight Simulator 2002 Professional Edition

Microsoft® Flight Simulator 2002 Professional Edition is the latest version of Microsoft's highly realistic aviation simulation - the best-selling PC flight simulation ever produced. FS2002 introduces many exciting features, including interactive air traffic control (ATC) and auto-generated scenery, plus challenging new aircraft and stunning visual enhancements that truly make Flight Simulator 2002 Professional Edition "As real as it gets."

From only **£36.99**
£43.46 inc. vat

Ask for item# E356835

Kodak DX3500

- 2.2M Pixel
- 1.8" LCD
- 8MB
- 3x Zoom
- One Touch Download!
- Automatic Battery Charging

From only **£184.99**
£217.36 inc. vat

Ask for item# E332427

* dock not included.

Adobe® Photoshop 7

Adobe Photoshop 7.0 software helps you to work more efficiently, explore new creative options, and produce the highest quality images for print, the Web, wireless devices, and anywhere else. With the new File Browser, you can inspect image data without opening files.

Upgrade for only **£101.99**
£119.84 inc. vat

Ask for item# E410067

Philips 24x12x40 CD-RW Drive

PHILIPS

- Internal IDE Retail Boxed Seamless Link Buffer Under-run Protection
- 24x Write 12x Rewrite 40x Read

From only **£64.99**
£76.36 inc. vat

Ask for item# E404100

HP ScanJet 5400C

- 2400 dpi Optical
- Launch Projects at the Touch of a Button
- "Copy" Button sends Photos or Documents Directly to the Printer for Photo Quality Duplicates
- Up to 99 Colour or Black and White Copies at the Touch of a Button
- "Share to Web" Button Optimizes Scans for Posting Pictures on the Web
- Parallel and USB

From only **£129.99**
£152.74 inc. vat

Ask for item# E350816

VAT inclusive pricing is shown at 17.5%. All products sold are subject to our standard Terms & Conditions, which are available on request. E&OE. Pricing excludes delivery.

A MicroWarehouse Company

Technomatic®

Providing Britain's top computer products for home and business.

Phone: **08705 275 262**

Sales and Information Lines open Mon - Fri: 8am - 6pm, Sat: 9am - 1pm

Established **30** years!

Quote Priority Code PCW

Order securely online at: www.technomatic.co.uk



Call us: 08705 275 262

Sales/Information lines open Mon - Fri: 8am - 6pm, Sat: 9am - 1pm

HP PSC950

Create & share photos - small and stylish - easy and fun to use

- Up to 10ppm colour 12ppm mono printing
- Up to 2400 x 1200dpi print resolution
- 9600dpi optical resolution for scanning



Only **£229.99**
£270.24 inc. vat

Ask for item# E364730

EPSON Stylus C80

- Up to 20ppm high quality plain paper printer
- Up to 2880dpi
- Smudge proof and waterproof pigment based inks



Only **£129.99**
£152.74 inc. vat

Ask for item# E367406

Canon BJ S100

Printing Fun @ Home!

- Up to 720 x 360dpi
- Up to 5ppm mono, 2ppm colour
- Compact, easy to set up, install and use.



Only **£29.99**
£35.24 inc vat

Ask for item# E366685



HL-1850 Laser Printer

From only **£479.99**
£563.99 inc. vat

- Up to 18ppm mppm
- Up to 1200DPI
- Optional 10/100BaseTX
- 3 Colour back-lit LCD display
- 16MB as standard

Ask for item# E414975 **brother**

ABBYY FineReader 6.0

ABBYY FineReader 6.0 with new digitising technology delivers better-than-ever text recognition and format retention. Colour pamphlets and articles with pictures, columns, tables, and spreadsheets are no problem.

Only **£49.99**
£58.74 inc. vat

Ask for item# E416936



MS Money

Manage today's finances, achieve tomorrow's goals

Microsoft Money 2002 is an easy to use personal finance management software application that helps people manage their personal finances, to include balancing a chequebook, budgeting reducing debt, planning for the future and managing your investments and taxes.

Ask for item# E356799



Only **£16.99**
£19.96 inc. vat

Maxtor 300LE 40GB External USB 2.0 Hard Drive

Ideal for adding storage for your digital photos, videos, MP3 songs, games and important electronic files. At up to 40 times faster than USB 1.1, the USB 2.0 interface is backward compatible with virtually all existing USB ports. This drive has a rotational speed of 5400RPM.

Ask for item# E384732



Only **£139.99**
£164.99 inc. vat

Microsoft FrontPage 2002

Build exactly the site you want with FrontPage Version 2002, the Office Web site creation and management solution.

From only **£56.99**
£66.96 inc. vat



Ask for item# E327938

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
COMPAQ DESKTOPS / NOTEBOOKS			
Evo N110 C1.0 14.1" TFT CD W98	E401345	£734.99	(£863.61)
Evo N110 PIII/14GHz 14.1" TFT DVD W2K	E398157	£969.99	(£1139.74)
Evo N115 Duron 1GHz/128MB/14.1" TFT/CD/XPHOME	E409576	£719.99	(£845.99)
Evo D300 P4 1.9GHz 256MB 40GB	E404033	£729.99	(£857.74)
Evo N160 PIII/2GHz 256MB/14.1"/DVD/W2K	E405076	£1129.00	(£1326.58)
HP DESKTOP / NOTEBOOKS			
XE310 C1GHz/20GB/128MB/CD/LAN/XPHOME	E399208	£375	(£440.63)
XE310 C1.2GHz/20GB/128MB/LAN/CD/XPPRO	E399209	£399	(£468.83)
XE310 PIII/1GHz/20GB/128MB/CD/LAN/XPPRO	E399211	£479	(£562.83)
XE3 C933MHz/10GB/128MB/14"CD/LAN/XPHOME	E399214	£649	(£762.58)
SONY VAIO DESKTOPS/NOTEBOOKS			
GRX316MP P4/256MB/30GB/16"CD-RW/DVD-ROM/XPPRO	E410048	£1699.99	(£1997.49)
GRX318SP P4/512MB/40GB/16"CD-RW/DVD-ROM/XPPRO	E411355	£2269.99	(£2667.24)
GRX319MP P4/1.25GHz/30GB/CD-RW/DVD-ROM/XPPRO	E408566	£1534	(£1802.45)
GRX314P PIII 2GHz/256MB/30GB/14"CD-RW/DVD-ROM/XPPRO	E408564	£1279.99	(£1503.99)
RD00FPD PIII/1GHz/256MB/30GB/12.1"CD-RW/DVD/FDD/XPPRO	E404172	£1499.99	(£1762.49)
SR41P PIII/800MHz/4128MB/20GB/10.4" External CD-ROM/XPPRO	E401201	£1475	(£1733.13)
L1MG P Celeron T5800 733MHz/128MB/20GB/9.5"/XPPRO	E401210	£1459	(£1714.33)
XC2: P4/1.7GHz/256MB/80GB/15"CD-RW/DVD/ XPPRO	E400426	£1236.99	(£1453.46)
RC202: P4/1.3GHz/256MB/80GB/CD-RW/DVD FDD/XPHOME	E400421	£1119.99	(£1315.99)
TOSHIBA LAPTOPS			
TOSH SAT PRO 6000: C1GHz/128MB/10GB/CD/14"/W98	E393139	£914	(£1073.95)
TOSH SAT PRO 6000: C1GHz/128MB/10GB/CD/14"/W2K/XPPRO	E393140	£945	(£1110.38)
Toshiba SAT PRO 6000 PIII/933/128MB/10GB/CD/14"/W98	E393141	£1009	(£1185.58)
Toshiba SAT PRO 6000 PIII/933/128MB/10GB/CD/14"/W2K/XPPRO	E393143	£1045	(£1227.88)
Toshiba SAT PRO 6000 PIII/1GHz/128MB/20GB/DVD/15"/W98	E393144	£1315	(£1545.13)
Toshiba SAT PRO 6000 PIII/1GHz/128MB/20GB/DVD/15"/W2K/XPPRO	E393145	£1349	(£1585.09)
IBM NOTEBOOKS			
IBM R30 PIII/1GHz/128MB/30GB/14.1"/DVD/ME/W2K	E386309	£1121.99	(£1318.34)
IBM R30 PIII/1GHz/128MB/30GB/14.1"/DVD/ME/W98	E386702	£1058.99	(£1244.31)
IBM R30 C900MHz/128MB/15GB/14.1"/DVD/ME/W2K	E386321	£699	(£821.33)
IBM R30 C900MHz/128MB/15GB/14.1"/DVD/ME/W2K	E386315	£649	(£762.58)
APPLE DESKTOPS / NOTEBOOKS			
iMac G4 700MHz: CD-RW/128MB/40GB Flat Panel	E399777	£1049	(£1232.58)
iBook G3 500MHz: CD-ROM/128MB/15GB 12.1" TFT	E400177	£829	(£974.08)
iBook G3 600MHz: DVD-ROM/CD-RW/128MB/20GB 12.1" TFT	E400178	£1075	(£1263.13)
iBook G3 600MHz: DVD-ROM/CD-RW/256MB/20GB 14.1" TFT	E399347	£1349	(£1565.08)

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
PowerMac G4 550MHz: DVD-ROM/CD-RW/256MB/20GB 15.2" TFT	E396672	£1665	(£1956.38)
PowerMac G4 667MHz: DVD-ROM/CD-RW/512MB/30GB 15.2" TFT	E396676	£2149	(£2525.08)
PowerMac G4 800MHz: 256MB/40GB/CD-RW	E403765	£1129	(£1326.58)
PDA'S / HANDHELD			
Palm m105	E304794	£89.99	(£105.74)
Palm m125	E367788	£149.99	(£176.13)
Palm m500	E326954	£199	(£233.83)
Palm m515	E408243	£274.99	(£323.11)
Compaq iPaq H3760/64MB/PPC/2002	E379456	£379.99	(£446.49)
Compaq iPaq H3850/64MB/PPC/2002/SD slot	E379457	£418.99	(£492.31)
Compaq iPaq H3870/64MB/PPC/2002/SD slot/BlueTooth	E379458	£474.99	(£558.11)
SONY Colour Clie ATRAC3/MP3	E372164	£269.99	(£317.24)
SONY Clie handheld Computer	E320835	£155	(£182.13)
Toshiba Pocket	E382546	£365	(£428.88)
MONITORS CRT			
Belitex 15" 102010	E211383	£79.99	(£93.99)
Samsung 15" CRT SM551S	E376596	£75.99	(£89.29)
Samsung 17" CRT SM735S	E376623	£99.99	(£117.49)
Formac 19" 19/400	E255466	£269.99	(£317.24)
Iiyama 17" VM 1402	E309225	£125.99	(£148.04)
Iiyama Monitor 19" VM 1451	E394621	£159.99	(£187.99)
Iiyama 22" VM Pro511	E362498	£479.99	(£563.99)
Mitsubishi 17" Plus 73	E365064	£149.99	(£176.24)
Mitsubishi Diamond Plus 92	E304347	£249.99	(£293.74)
Mitsubishi Diamond Plus 220	E304348	£499.99	(£587.49)
SONY CPD-E230 17" CRT	E331236	£159.99	(£187.99)
SONY CPD-6420	E331235	£369.99	(£434.74)
ViewSonic 17" E70f	E304629	£139.99	(£164.48)
ViewSonic 19" G90f	E301188	£239.99	(£281.99)
ViewSonic 22" P220f	E294341	£499.99	(£587.49)
MONITORS LCD			
Apple 15" LCD Studio Display	E243325	£419	(£492.33)
Apple 17" LCD Studio Display	E336493	£669	(£786.08)
Iiyama 15" 3817	E394098	£299.99	(£352.49)
Iiyama 17" 4314	E394380	£439.99	(£516.99)
LG Electronics 15" FL575Ms	E256882	£399.99	(£469.99)
NEC LCD 1550v 15"	E378074	£289.99	(£340.74)
NEC LCD 1650E 16" TFT LCD	E402457	£649	(£762.58)
Samsung 15" SM151S	E372202	£279.99	(£328.99)

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
Samsung 15" SM151S/silver	E378086	£289.99	(£340.74)
Samsung 17" SM171S	E377855	£479.99	(£563.99)
Sony 15" SDM-M510B w/DV-I	E400069	£365.99	(£430.04)
Sony 15" SDM-N50R	E394998	£549.99	(£646.24)
Philips 15" 150S	E323374	£269.99	(£317.24)
ViewSonic 15" VE150m	E067124	£299.99	(£353.99)
ViewSonic 17.4" VG175	E274568	£599.99	(£704.99)
Apple 22" LCD Cinema Display	E243327	£1739	(£2043.33)
PRINTERS			
Brother HL-1440 2MB	E366688	£214.99	(£252.61)
Brother HL-1450	E366693	£229.99	(£270.24)
Epson Stylus C60	E376326	£64.99	(£76.36)
Epson Stylus C70	E376280	£102.99	(£121.01)
Epson Stylus Photo 810	E376291	£88.99	(£104.56)
Epson Stylus Photo 890	E293862	£124.99	(£146.86)
Epson Stylus Photo 895	E339873	£132.99	(£156.26)
Epson Stylus Photo 1290	E293863	£258.99	(£304.31)
Epson EPL-5900L	E398788	£158.99	(£186.81)
HP DeskJet 845C	E367621	£59.99	(£70.49)
HP DesJet 940C	E347397	£77.99	(£91.64)
HP DeskJet 960C	E347395	£112.99	(£132.76)
HP DeskJet 990CXI	E247134	£184.99	(£217.36)
HP DeskJet 995C	E376992	£244.99	(£287.86)
HP CP1160	E367894	£199.99	(£234.99)
HP LaserJet 1000w	E367851	£149.99	(£176.24)
HP LaserJet 1200	E308449	£224.99	(£264.36)
HP LaserJet 1200N	E308451	£344.99	(£405.36)
HP LaserJet 2200D	E308444	£515	(£605.13)
HP LaserJet 2200DN	E308446	£645	(£762.58)
HP LaserJet 4100N	E308428	£919	(£1075.13)
HP LaserJet 4100TN	E308429	£1015	(£1192.63)
HP PSC 950	E364730	£229.99	(£270.24)
HP OfficeJet V40	E305070	£164.99	(£182.11)
MEMORY			
DIMM 64MB 168pin DRAM 18NS 133MHz	MY12294	£17.99	(£20.96)
DIMM 128MB 168Pin SDRAM 8NS 133MHz	MY12295	£28.99	(£34.06)
SODIMM 128MB PC100 INC G3 Powerbook	MY12135	£31.99	(£37.59)
DIMM 128MB 168Pin SDRAM 10NS 100MHz	MY9371	£28.99	(£34.06)
DIMM 64MB 168Pin SDRAM 18NS 133MHz	MY12293	£17.99	(£20.96)

VAT inclusive pricing is shown above in brackets at 17.5%. All products sold are subject to our standard Terms & Conditions, which are available on request. E&O. Pricing excludes delivery.

TERMS AND CONDITIONS:

• We accept payment by Access, Visa, and American Express credit cards. • Credit card authorisations are obtained when your order is placed. BUT YOUR CREDIT CARD WILL NOT BE CHARGED UNTIL EACH ITEM IS SHIPPED. • Corporate orders will be accepted upon credit approval and subject to status. • Leasing is available via Access Commercial Credit and cheques may be referred to cheque clearing system. • V.A.T. inclusive prices are shown in brackets at 17.5%. • Defective software will be replaced subject to return of the product with all original contents (including packaging). • Defective hardware will be repaired or replaced at our discretion. • Please remember to back-up all your data before installing any new hardware, software or peripherals, we cannot be responsible for any lost data. • Next Day Delivery as from £9.95, or FREE for on-line orders over £200 ex VAT. • Place your order for "in stock" items up to 5:00pm, and we will ship same day, UK Mainland Monday-Friday, via NEXT DAY DELIVERY service (bearing system failure). • Some products have minimum system requirements. Please call if in doubt. • Policies, item availability, promotions, and prices subject to change without notice. • Due to the fast-changing nature of the IT marketplace, prices often change after going to press. Please confirm the current price at time of ordering. Errors and omissions excepted. • The price in effect when we receive your order will be the price that is charged. • We regret we cannot be responsible for typographical errors. • You may receive direct mail promotions from other companies unless you advise us by phoning our national rate number. Telephone call may be recorded for customer protection. All products sold are subject to our standard Terms and Conditions which are available on request. © Copyright 2001 MicroWAREHOUSE Ltd. Technomatic is a trademark of MicroWAREHOUSE Ltd.

www.technomatic.co.uk

These products are just a fraction of the 15,000 available on-line!

Technomatic® - Britain's computer technology experts for over 30 years!

Jasc Paintshop Pro 7

The complete tool for your digital photo and Web needs

Packed with programs and brimming with extras, The Anniversary Edition provides absolutely everything you need to edit photos, create Web graphics, draw, paint, animate and organise your images.

* Whilst Stocks Last

Ask for item# E266863

Only **£64.99***
*76.36 inc. vat



EXCLUSIVE Satellite 1800 - 364

- Celeron 1.1GHz Processor • 128MB RAM
- 15GB HDD • Modem • LAN
- CD-ROM • Wireless • 14" TFT Screen
- Windows XP Pro

TOSHIBA

£795

£934.12 inc. vat

Ask for item# E410278



Belinea 17" CRT 103020

LOWEST PRICE EVER!

- 17" (16" Viewable) CRT
- Resolution up to 1280 x 1024 @ 65Hz
- 0.27mm Dot Pitch
- 3 Year Warranty
- MPR II Compliant

£99.99

£117.49 inc. vat

Belinea

Ask for item# E320998

Symantec pcAnywhere 10.5

- PCAnywhere Packager allows administrators to create small, customized installations, define policy settings, and generate MSI files or self-extracting executables
- Remote Access Perimeter Scanner detects unprotected remote access products on network and phone lines
- New: Rebootless Host option allows for quick installation of a pcAnywhere host without having to reboot the computer



Ask for item# E391822

£117.99

£138.64 inc. vat



Norton Internet Security 2002

Win 98/NT/2000/ME

Norton Internet Security 2002 is your essential protection from viruses, hackers, and privacy threats. It protects you and your PC when you email, bank, shop, or play online. This powerful suite includes Norton AntiVirus & Norton Personal.

Ask for item# E364844

£37.99

£44.64 inc. vat



Iomega Peerless

Peerless base station with USB 1.1 interface module

- Peerless, the power of a hard drive - in your hand
- Small enough to fit in your pocket
- 10Gb or 20Gb disks, big enough to hold your entire PC
- Take your PC with you wherever you go on one lightweight disk



£284.99

£334.86 inc. vat

Ask for item# E331311

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
MM 256MB 166Pin SDRAM 8NS 133MHz	MY12293	£56.99	(£66.96)
BUSINESS SOFTWARE			
MS Office XP Standard Win32 CD	E322738	£334.99	(£393.61)
MS Office XP Standard Upg Win32 CD	E322736	£149.99	(£176.24)
MS Office XP Professional Win32 CD	E322740	£416.99	(£489.96)
MS Office XP Professional Upg Win32 CD	E322742	£209.99	(£246.74)
MS Office XP Developer Win32 CD	E322763	£559.99	(£657.99)
MS Office XP Developer Upg Win32 CD	E322764	£364.99	(£428.86)
Act 2000 Full	PM1004	£78.99	(£92.81)
Act 2000 Upg	UP4457	£69.99	(£82.24)
Filemaker Pro Upg	E335413	£111.99	(£131.59)
Filemaker Pro Full	E335492	£194.99	(£229.11)

OPERATING SYSTEMS

MS Windows XP Home Full Product Win	E356829	£132.99	(£156.26)
MS Windows XP Home Upgrade Win	E356830	£68.07	(£79.98)
MS Windows XP Professional Win	E356820	£196.99	(£231.46)
MS Windows XP Pro Upg Win	E356821	£129.99	(£152.74)

PUBLISHING / GRAPHICS SOFTWARE

New Adobe Photoshop 7.0	E410065	£442.99	(£520.51)
New Adobe Photoshop 7.0 UPG	E410067	£101.99	(£119.84)
Adobe Acrobat 5.0 Win32 CD	E317900	£159.99	(£187.99)
Adobe Acrobat 5.0 Upg Win32 CD	E318763	£64.99	(£76.36)
Adobe Illustrator 10 Upg	E376114	£106.99	(£125.71)
Adobe Illustrator 10 Full	E376108	£294.99	(£346.61)
New QuarkXPress 5.0 full	E407920	£893.99	(£1050.54)
Jasc Paintshop Pro 7 *Whilst Stocks last	E266863	£32.99	(£38.76)
Corel Draw 10 Full	E269472	£319.99	(£375.99)
Corel Draw 10 Upg	E269473	£147.99	(£173.89)
Adobe Indesign 2.0 Full	E394935	£538.99	(£633.31)
Adobe Indesign 2.0 Upg	E394942	£74.99	(£88.11)
*Jaws PDF Creator 2.1 * Whilst stocks lasts	E394413	£69.99	(£82.24)

WEB / MULTIMEDIA SOFTWARE

MM Dreamweaver Full New MX		Please Call	
MM Dreamweaver Upg New MX		Please Call	
Fireworks Full New MX		Please Call	
MM Fireworks Upg New MX		Please Call	
MM Studio MX		please call	
MM Director Shockwave 8.5 Studio	E329179	£894.99	(£1051.61)

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
MM Flash MX Full	E244547	£364.99	(£428.86)
MM Flash MX UPG WIN	E410853	£144.99	(£170.36)
Adobe GoLive 6.0 Full	E399938	£279.99	(£328.99)
Adobe GoLive 6.0 Upg	E399942	£70.99	(£83.41)
Adobe LiveMotion 2.0 Full	E399935	£136.99	(£160.96)
New! Adobe Web Collection 5.0 Win	E420206	£829.99	(£975.24)
MS FrontPage 2002 WIN	E327937	£116.99	(£137.46)
MS FrontPage 2002 UPG WIN	E327938	£59.99	(£70.49)

PROGRAMMING / SERVER SOFTWARE

MS Windows Server 2000 Cd 5 Clients	DCS7062	£679.99	(£798.99)
MS Windows Advanced Server 2000 CD 25 Clients	DCS7061	£2700	(£3172.50)
MS Windows Server 2000 Version Upgrade CD 5 Clients	DCS7063	£329.99	(£387.74)
MS VStudio .Net Pro Upg 2002 Win9X/NT/2000/XP CD	E391114	£214.99	(£252.61)
MS VStudio .Net Ent DE UPGRADE 2002 Win 9X/NT/XP CD	E391169	£729.99	(£857.78)
MS Visual C++ .Net Std 2002 Win 98/NT/2000 CD	E391084	£346.99	(£407.71)
MS Visual Basic .Net Std 2002 Win 9X/NT/2000 CD	E391105	£176.99	(£207.96)
MSDN Universal Full	E391101	£729.99	(£857.78)
Borland C++ Builder V6.0 Enterprise Full System	E402959	£1948.99	(£2288.90)
Borland Delphi V6.0 Personal Edition	E402867	£69.99	(£82.24)
Veritas Backup Exec 8.6 NT/2000	E342491	£299.99	(£352.49)
MS SQL Server 2000 Std SCAL	E389930	£1049	(£1232.57)
J Builder 5 Personal was Foundation	E402890	£519.99	(£610.99)
J Builder 5 Professional Scholar Win	E407238	£66.99	(£79.24)
Borland Delphi Pro 6.0 Scholar Win	E335125	£79.99	(£93.99)

UTILITY SOFTWARE

Norton AntiVirus 2002 V8	E364591	£29.95	(£35.19)
Norton Utilities 2002 V6	E362344	£27.49	(£32.30)
Norton Internet Security 2002 V4	E364844	£37.99	(£44.64)
Norton Personal Firewall 2002 V4	E364808	£23.99	(£28.19)
Norton Systemworks 2002 V5	E364633	£45.99	(£54.04)
PC Anywhere 10.5 Host/Rem	E392114	£97.89	(£115.02)
PCAnywhere 10.5 H/R Upg	E392168	£75.99	(£89.29)

EPSON PRINTER SUPPLIES

Tri Colour Ink Cartridge 740/670	PR1582	£13.69	(£15.09)
Black Ink Cartridge 740/760	PR1581	£13.99	(£16.44)
Black Ink Cartridge 680	E257213	£16.35	(£19.21)
Colour Cartridge Stylus 400/600/800/1520	PA0414	£13.45	(£15.80)
Glossy Photo Paper A3 20 Sheets	PA0417	£14.99	(£17.61)

DESCRIPTION	CODE	£ EX VAT	£ INC VAT
HP PRINTER SUPPLIES			
Black Ink Cartridge 750C/850C/820Cx/1600C	51645A	£18.49	(£21.73)
Tri Colour Ink Cartridge 970Cx/930C	C6578D	£21.79	(£25.60)
Tri Colour Ink Cartridge D3890C/D895Cx	C1823D	£19.99	(£22.49)
Ultra Precise Black Toner Cartridge LJ2100	C4096A	£63.99	(£75.18)
Bright White Paper A4 (200 Sheets)	C5977B	£3.95	(£4.64)
CDR BLANK MEDIA			
Sony CDR 74Min 650MB CDD74CN	ME6399	£1.05	(£1.25)
TDK CDR 74Min 650MB	ME7271	£1.45	(£1.70)
Maxell 80min CD-R 700mb	E342536	£1.15	(£1.35)
DLT IV TAPES			
Maxell DLT IV TK88 20/40-35/70GB	ME7781	£50.99	(£59.91)
Sony DLT IV TK88	ME7923	£54.99	(£64.61)
Imation DLT IV	ME7469	£52.95	(£62.22)
HP DLT IV TK88 20/40-36/70GB	ME7021	£52.95	(£62.21)
Fuji DLT IV TK88	ME7080	£54.99	(£64.61)
Quantum DLT IVTK88	ME7823	£53.95	(£63.39)

MODEMS

US Robotics V92 56K External Fax Modem	E393362	£51.99	(£61.09)
US Robotics 56K Message Modem Ext	DMD3588	£68	(£72.99)
US Robotics 56K PCI Voice FaxModem	E249274	£36.99	(£43.46)
Hayes Accura 56K Int PCI Modem	E108876	£37.99	(£44.64)
Elcon Diva ISDN USB T/A	DMD4778	£52.99	(£62.26)
Elcon DVA Speed 850 ISDN T/A	E304457	£64.99	(£76.36)
Elcon DVA 2430SE ADSL Modem	E337038	£154.99	(£182.11)
PC CARDS			
3Com OfficeConnect 10/100 56K Type 3 PC Card	E372365	£59.99	(£70.49)
3Com OfficeConnect 10/100 56K XJACK PC Card	E372315	£66.99	(£78.71)
USR 56K GSM PC Card	DMD4548	£74.99	(£88.11)
3COM 10/100 LAN PC card XJACK	E000152	£75.99	(£89.29)
3COM OfficeConnect 10/100 PC card	E000155	£34.99	(£41.11)

NETWORKING SWITCHES

3Com OfficeConnect 8 port dual speed Switch	E331212	£78.99	(£92.81)
Netgear FS308 8 port Dual speed Switch	DEH4197	£99.99	(£117.49)
Netgear 16 port 10/100 R/M switch	DEH3596	£163.99	(£192.69)
Netgear 24 port 10/100 R/M switch	DEH4646	£177	(£209.98)
3Com OfficeConnect 5 Port 10/100 Switch	E331211	£56.99	(£66.96)
3Com OfficeConnect 8 Port 10/100 Switch	E331212	£78.99	(£92.81)

Quote Priority Code PCW



We accept these major credit cards:

Ask about 0% Financing!

A Micro Warehouse Company

Technomatic®

Providing Britain's top computer products for home and business.





nethighstreet.com

w: www.nethighstreet.com t: 0870 777 52 52

a: 8 Allcock Street, Birmingham, B9 4DY e: sales@nethighstreet.com

a: 616 Bristol Road, Selly Oak, Birmingham, B29 6BQ

"The component quality is excellent"

Computer Shopper, Mar 2002

"NetHighStreet.Com has been bubbling under the PC Plus Awards for a while producing solid PCs"

PC Plus - April 2001

"it's built for top performance"

PC Advisor - Nov 2001

"The prize for best sound in the chart"

PC Advisor - Dec 2001

"Solid performance and excellent component quality throughout"

Computer Shopper - Mar 2002

"The build quality is high, while accessibility for upgrades is excellent"

Computer Shopper - June 2002



PCPlus

Verdict 8/10
Feb 2002



APRIL 2002



Nov 2001



Dec 2001

	OFFICE	HOME	PRO	EVO	ELITE
Motherboard	PC Chips 810LMR	ASUS A7N266-VM	ASUS A7S333	ASUS P4S333	ASUS A7V333
Memory	128 MB PC133 SDRAM	256 MB DDR PC2100			
Hard Drive	20 GB UDMA 100	40 GB UDMA 100	40 GB UDMA 100	40 GB UDMA 100	60 GB UDMA 100 7200 RPM
Graphics	AGP Graphics O/B	nVIDIA nFORCE	GeForce 4 MX420	GeForce 4 MX420	GeForce 4 Ti4200
Multimedia	52x CD-ROM Drive	52x CD-ROM Drive	16x DVD-ROM Drive	16x DVD-ROM Drive	16x DVD-ROM Drive
CD-RW	Option Available	Option Available	32x12x40 Buffer Underrun Proof	32x12x40 Buffer Underrun Proof	32x12x40 Buffer Underrun Proof
Sound	SIS Sound O/B	Dolby Digital Sound	6 Channel Audio	6 Channel Audio	6 Channel Audio
Modem	56K v.90 Modem & 10/100 Network Card	56K v.92 Modem & 10/100 Network Card	56K v.92 Modem	56K v.92 Modem	56K v.92 Modem
Monitor	15" Hansol 510A Colour Monitor	17" Hansol 720E Colour Monitor	17" Hansol 720E Colour Monitor	17" Hansol 720E Colour Monitor	19" Hansol 920P Colour Monitor
Speakers	200W PMPO Speakers	200W PMPO Speakers	Subwoofer & 2 Satellite Speakers	Subwoofer & 2 Satellite Speakers	Creative Inspire 5.1 Surround Sound Speakers
Extras	2 USB Ports 3.5" Floppy Disk Drive	4 USB Ports, 2 USB 2 Ports 3.5" Floppy Disk Drive			
Warranty	12 Months RTB Warranty	12 Months RTB Warranty	12 Months RTB Warranty	12 Months RTB Warranty	12 Months RTB Warranty
	AMD Duron 1GHz £300	AMD Duron 1.2GHz £398	Athlon 1800 + XP £563	Pentium 4 1.6GHz £590	Athlon 1800 + XP £732
	AMD Duron 1.2GHz £315 (£370.13 inc.VAT)	Athlon 1800 + XP £435 (£511.13 inc.VAT)	Athlon 1900 + XP £581 (£682.68 inc.VAT)	Pentium 4 1.7GHz £615 (£722.63 inc.VAT)	Athlon 1900 + XP £750 (£881.25 inc.VAT)
	Athlon 1800+ XP £347	Athlon 1900 + XP £453	Athlon 2000 + XP £611	Pentium 4 1.8GHz £630	Athlon 2000 + XP £780
	Athlon 1900+ XP £365 (£428.88 inc.VAT)	Athlon 2000 + XP £483 (£567.53 inc.VAT)	Athlon 2100 + XP £649 (£762.58 inc.VAT)	Pentium 4 2GHz £705 (£828.38 inc.VAT)	Athlon 2100 + XP £818 (£961.15 inc.VAT)

All systems come with Microsoft Internet Keyboard, Microsoft Wheel Mouse and no Operating System pre-loaded.

POPULAR UPGRADES

Upgrade 15" Monitor to 17"	£15	£18	Upgd 128MB to 256MB SDRAM	£12	£14	Upgd GF4 MX420 to Ti 4200	£62	£73
Upgrade 17" Monitor to 19"	£40	£47	Upgd 256MB to 512MB DDR	£55	£65	Upgd GF4 MX420 to Ti 4400	£145	£171
Upgd 17" Monitor to 15" TFT	£169	£199	Upgd 20GB to 40GB 5400 RPM	£7	£9	Add Epson C20 Printer	£35	£41
Upgd 15" Monitor to 15" TFT	£182	£214	Upgr 40GB to 60GB 5400 RPM	£15	£18	Add Artec USB Scanner	£31	£37
Add Windows XP	£59	£70	Upgd 60GB to 80GB 7200 RPM	£18	£21	Add On-Site Warranty	£20	£23

For a wide range of **notebooks** and **components** visit website

E. & O. E. Prices and specifications subject to change without notice. All trademarks acknowledged. All prices exclude carriage. See website for full terms & conditions. Prices including VAT in brackets. Photos are for illustration purposes only.

Ricoh Caplio RR120

PRICE £199.99 (£170.20 ex VAT) **CONTACT** Ricoh 020 8261 4031 www.ricoh.co.uk

PROS Comfortable to use; great price **CONS** LCD difficult to see in sunlight

OVERALL The LCD lets it down – the Olympus entrant is a better choice

OVERALL SCORE ■■■■

The 2.2megapixel Caplio has two image size settings – the rather unconventional 1,792 x 1,200 and 896 x 600. It is supplied with a standard 8MB Smart Media card. Unfortunately, it is one of those love it or hate it designs – very retro, and with a tendency to pop off its lens cap if you carry it without the bundled case. It feels comfortable in your hand, though, and is well balanced.

The lens features a 3x optical zoom, backed up by 2x digital, and has a focal length equivalent to 38-114mm on a conventional 35mm camera – a range that stretches from wide angle to telephoto. The macro mode, meanwhile, will get you within 8cm and 40cm of your subject.

The optical viewfinder is backed up by a 1.5in LCD, which is also home to the functional but very basic menu. We found this screen very difficult to use in bright sunlight where we had been able to clearly see what was going on with the other models on test. Two shooting modes allow

for either fully automatic or semi-manual photography. The latter accommodates adjustments of +/-1.5EV in 0.3EV steps, and one of five white balance settings including automatic. The self-timer can be set to 10 or two seconds.

The RR120 is powered by four regular AA batteries, and while there is a port for external power input, there is no adaptor in the box.

We were a little disappointed with the Ricoh's performance in the flower bed test. The image was a little darker than those produced by other cameras on test but it could be quickly brightened in any image-editing application.

However, it did very well when used inside, producing the brightest picture of the lot under strip lighting. It was perhaps a little too bright to be realistic, but impressive nonetheless. It produced a good clean white on the pages of our dictionary and picked up good detail in the edges and corners of our photos.



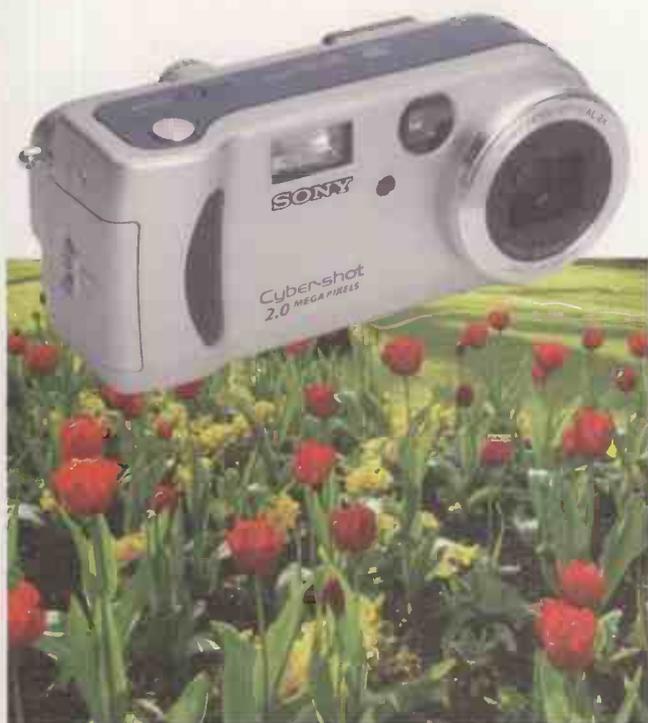
Sony Cybershot DSC-P50

PRICE £300 (£255.32 ex VAT) **CONTACT** Sony 08705 111 999 www.sony.co.uk

PROS Extensive hardware functionality **CONS** Output a little disappointing

OVERALL Easy to use and great for the more adventurous beginner

OVERALL SCORE ■■■■



Sony came from nowhere and quickly established itself in the digital camera market thanks to superior lenses, ease of use and first-class power management using Info-lithium batteries. It is a little disappointing then, although not surprising in a budget model, to find that the 2megapixel P50 uses regular rechargeable AA cells.

Exposure can be set to +/-2EV in 0.3EV steps, while focus can be set to multi-spot auto focus, centre auto focus, or a range of distances from 50cm to infinity. You'll probably want to leave the ISO setting on automatic, but if you're after a specific effect or believe you know better than the P50, then 100, 200 and 400 ISO options are available. The lens is rated as being the equivalent of 41-82mm on a regular 35mm camera.

The well-organised menu has an impressive range of functions that you would normally expect to apply through image-editing software. Sharpness and picture effects such as sepia, solarise or black and white

are included but will most likely be shunned by serious photographers.

The common image sizes of 1,600 x 1,200, 1,280 x 960 and 640 x 480, meanwhile, are supplemented by a 1,600 x 1,067 setting.

The camera is supplied with a 16MB Memory Stick, capable of holding 16 high-resolution shots, rising to 182 if you opt for a lower resolution and higher compression setting.

The Sony's performance in the flower bed test was good, although images were slightly more saturated than the rest of the group. We found it lacked the life and realism of images produced by its competitors. That said, luminosity was even across the image. Focus was also consistent across the shot, but not as sharp as seen in the Kodak's output.

Our interior test image, taken under strip lighting, was a little grey, but we still placed it just behind the Canon, our Editor's Choice camera. Again, the image lacked the vibrancy and life seen in Kodak's output.

TABLE OF FEATURES



MANUFACTURER	CANON	EPSON	HP	KODAK
MODEL	POWERSHOT A40	PHOTOPIC 2100Z	PHOTOSMART 715	OX3600 ZOOM
Price inc VAT (ex VAT)	£299 (£254.47)	£305.53 (£260.05)	£349 (£297.02)	£249 (£211.91)
Contact	0800 616 417	0800 220 546	08705 474 747	0870 243 0270
Website	www.canon.co.uk	www.epson.co.uk	www.hp.com/uk	www.kodak.co.uk
Resolution (megapixels)	2	2.3	3.3	2.2
Image size options	1,600 x 1,200/ 1,024 x 768/640 x 480	2,160 x 1,440 (interpolated)/ 1,800 x 1,200/720 x 480	2,048 x 1,536/640 x 480	1,800 x 1,200/ 900 x 600
Bundled media size	8MB	8MB	16MB	8MB
Memory type	Compact Flash	Compact Flash	Compact Flash	Internal/Compact Flash
Flash modes	On/off/auto/fill-in/red-eye	Off/auto/red-eye	On/off/auto/red-eye	Off/auto/fill-in/red-eye
35mm lens equivalent	35-105	35-70	32-102	35-70
Aperture (f-stops)	f2.8-f4.8	f3.3-f4.5	f2-f8 (tele: f2.5-f10)	f3.3-f4.5
Optical/digital zoom	3x/2.5x	2x/2.5x	3x/2x	2x/3x
Macro mode range (cm)	16-76	30-50	20-60	28-60
Attachment for extra lens	✓	✗	✓	✓
Tripod mount point	✓	✓	✓	✓
Self-timer (seconds)	2/10	10	10	10
Power	4 x AA	4 x AA (rechargeables supplied)	4 x AA (supplied)	2 x AA/battery pack
Exposure rating (ISO)	50/100/200/400	100/200	100	100/200
Interface	USB cable	USB cable	USB cable	USB dock
LCD display size	1.5in	1.6in	1.8in	1.6in
Other extras	Image browsers and converters	MGI Photosuite SE	HP Photo Imaging Software	Kodak Picture Software
Overall score	■■■■■	■■■■■	■■■■■	■■■■■

TABLE OF FEATURES



MANUFACTURER	NIKON	OLYMPUS	RICOH	SONY
MODEL	COOLPIX 2500	CAMEDIA C-220 ZOOM	CAPLIO RR120	CYBERSHOT DSC-P50
Price inc VAT (ex VAT)	£299.99 (£255.31)	£199.99 (£170.20)	£199.99 (£170.20)	£300 (£255.32)
Contact	0800 230 220	0800 072 0070	020 8261 4031	08705 111 999
Website	www.nikon.co.uk	www.olympus.co.uk	www.ricoh.co.uk	www.sony.co.uk
Resolution (megapixels)	2	2	2.2	2.1
Image size options	1,600 x 1,200/1,280 x 1,024/ 1,024 x 768/640 x 480	1,600 x 1,200/ 1,024 x 768/640 x 480	1,792 x 1,200/ 896 x 600	1,600 x 1,200/1,600 x 1,067/ 1,280 x 960/640 x 480
Bundled media size	16MB	8MB	8MB	16MB
Memory type	Compact Flash	Smart Media	Smart Media	Memory Stick
Flash modes	On/off/auto/red-eye/slow sync	On/off/auto/red-eye/slow sync	On/off/auto/red-eye/slow sync	On/off/auto/red-eye
35mm lens equivalent	37-111	35-114	38-114	41-82
Aperture (f-stops)	f2.7-f4.8	f2.8-f4.9	f2.9-f6.9	f3.8
Optical/digital zoom	3x/4x	3x/2.5x	3x/2x	2x/3x
Macro mode range (cm)	To 4	20-50	8-40	Automatic down to 8
Attachment for extra lens	✗	✗	✗	✗
Tripod mount point	✓	✓	✓	✓
Self-timer (seconds)	10	12	2/10	10
Power	Rechargeable Li-ion supplied	2 x AA batteries	4 x AA batteries	2 x AA rechargeable batteries
Exposure rating (ISO)	100	80-160 (automatic)	100/200/400	100/200/400
Interface	USB cable	USB cable	USB cable	USB cable
LCD display size	1.5in	1.5in	1.5in	1.6in
Other extras	Nikon View 5	Camedia Master	Caplio download software	MGI Photosuite SE
Overall score	■■■■■	■■■■■	■■■■■	■■■■■

Editor's Choice

The only way to test cameras is to use them, which is exactly what we did here. We chose two environments. The first was a sunny flower bed in full bloom, with bright red tulips, yellow flowers and a backdrop of green grass. Here, we looked for realistic colours that were neither overexposed nor too oversaturated. Slightly saturated images can look good, but take it too far and you start to lose detail.

Next, we took outdoor shots both in bright sunlight and under overcast skies. Again, we checked for realistic colours, sharp edges and an accurate rendition of the scene.

Finally, we grouped together a range of objects, chosen for their varied surfaces. Furry toys, shiny yo-yos, matt stress balls and the pages of a dictionary with very fine print were arranged in a photography studio where the lighting could be carefully controlled. We then used strip lighting to simulate average interior lighting and took a picture of the scene, using a tripod to ensure that each camera had the same view. This image was examined to see how well the colours had been rendered, whether transparent surfaces remained see-through, and how well each camera coped with detail in the edges and corners of the frame.

It must be stressed that while our tests threw up differences between the cameras submitted, none of the results were bad, *per se*. Each would be good enough to print and hang on a wall, and even if you are not initially happy with the results most of the cameras come with idiot-proof software to tweak the colours and contrast. The differences between each one were so small that most only lost marks on usability and design issues rather than performance, highlighting how important it is to hold a product before making your purchase.

The winners

Each winner was chosen by comparing output, features, usability and build quality to that displayed by the rest of the group. It is the **Canon Powershot A40**, then, that walks away with this month's **Editor's Choice** award. Not only did it feel well balanced and pleasant to use, but it also produced a set of well rendered images.

Most only lost marks on design issues rather than performance

Images were well balanced, with realistic colours in both our internal and external test shots. We were a little disappointed that it was bundled with only an 8MB media card, especially with memory prices falling, but this is a complaint common to many of the products reviewed here.

What finally swung it for the Canon, though, was its versatility. First-time users will cut their teeth with its automatic mode and make more use of the manual settings as their confidence grows.

The first of our **Highly Commended** awards is carried away by the **Kodak DX3600 Zoom**. This produced some of the best images of the group, but was neither as versatile as some others tested, nor as pleasant to use,

Like the Canon, it can take supplementary lenses, which will appeal to any user worried that they may be restricted by the rather average optics built into the camera itself. However, we did not take to the docking station. While this provided an easy way to upload images to the hard drive it takes up desk space. With Windows XP providing such good camera and scanner support, recognising most models as an external hard drive, the dock is an idea slightly after its time, but it's a good option if you're still using Windows 98 or ME.

The **Olympus Camedia C-220 Zoom** takes our final **Highly Commended** award. We weren't entirely enamoured with the zoom control and the LCD was a little slow to refresh, but those factors aside, it was well balanced and pleasant to use. Its output was clean and bright, and for a camera with few controls it was surprisingly versatile – a good thing in our view.

If you frequently find yourself in places where you would rather not take an expensive camera, it is the ideal choice. Not only is it an absolute bargain at less than £200, it is also small enough to slip discretely into a trouser or jacket pocket.

We would like to give an honourable mention to the Nikon Coolpix 2500, which produced some very impressive output and was small enough to carry around discretely. Were it in a more conventional body, or simply produced without the clumsy frame that runs around the edge of the lens unit it would have been an award winner.



Canon Powershot A40



Kodak DX3600 Zoom



Olympus Camedia C-220 Zoom



**No expensive 30 page advert
No fancy full colour brochure
No flash, expensive showroom**

Just a small sample of the many awards we've won in 2001

**www.
poweroid
.com**

ANY OTHER PC IS A COMPROMISE

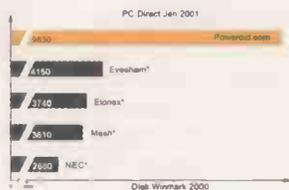
You owe it to yourself. Visit our website today.



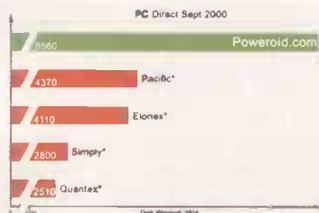
**Premium PCs:
(Model 9008)**

**AMD Athlon XP 2100+
Coolermaster 101 "silver finish" case
Asus A7V333 motherboard with USB 2.0
80 - 120 GB 7200 rpm UDMA 133 hard disk
512 MB DDR SDRAM PC2100 - PC2700
16 x DVD, Plextor 40 x CDRW Burn Proof
GeForce 4 Titanum Ti4600, 64 MB
(Option of ATI Radeon All In Wonder 8500 DV)
Creative Audigy soundcard, IEEE 1394
Iiyama VM Pro 454 monitor
(Option of LCD screen)
Microsoft USB keyboard and mouse
Windows XP ... and a lot more**

Also available in Intel 2.4 GHz
See model 9204



A lot more affordable than you think



**(No showroom)
Registered Office:
7A Elton Way Ind Estate
Hoddeston, Essex, SSS1 4XG**

Tel: 0870 2200 444

The usual stuff:
Pentium, Pentium PIII,
P4 & Celeron are regd trademarks
of Intel Corp. Athlon, AMD, Windows &
other names are regd trademarks & refer to
products of entities claiming the mark/name. We
disclaim proprietary interest in other's names. Prices &
specs subject to usual market changes. 3% handling fee on
creditcard transactions only. Packing, del & transit insurance = £29+vat

Graphs produced are extracts from magazine g

How come we are one of the most successful PC companies in the UK?

www.
poweroid
.com

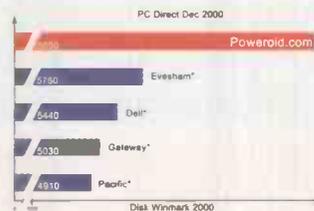


Over 20 of the PC industry's most coveted awards ... & that's just in 2001!

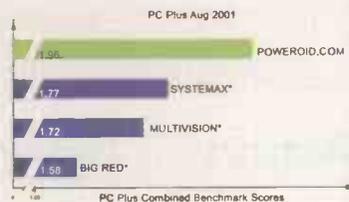
- "Poweroid is a company to keep your eye on in the future" ... PC Advisor
- "Poweroid is far ahead of the rest of the pack" ... PCDirect
- "Poweroid is the most consistent performer in the top 10 charts" ... PC Advisor
- "Poweroid leads the field in most of the benchmark tests" ... PC Direct
- "Poweroid often wins our highest accolades" ... PC Advisor
- "Poweroid's offerings have just got better and better" ... PC Plus
- "Poweroid is an important player in the IT industry" ... PC Advisor

www.
poweroid
.com

ANY OTHER PC IS A COMPROMISE



Our website is about more than selling you a PC. It's committed to providing quality advice, free support, extensive resources, PC buying guides, latest pricing, driver downloads + our very popular secrets on tweaking PCs to get the same award winning performances we do. Bookmark www.poweroid.com. You'll need it one day.



EUROCARD
MasterCard

VISA

Poweroid is a trademark of Best Price Computers Ltd
Established in 1996

Tel: 0870 22 00 444

16.45pm

Mr Wright emails his new 10MB presentation to his sales team

16.45pm

Mrs Wright makes three share trades for her latest client

ADSL sharing made simple



DG814

An end to fighting over access to the Internet!

Only **£149.99** (inc VAT RRP)

16.45pm

Abby Wright has a web cam chat with a school friend

16.45pm

Daniel Wright plays online and beats his mate...again

The NETGEAR DG814 will help you discover multi-user, high-speed ADSL* Internet access, allowing you to share a single ADSL line between four directly connected PCs. Connected PCs can simultaneously access the web, download MP3s / videos, share files, view streamed video and play head-to-head Internet games.

Setup couldn't be simpler with the on-screen guide, and the DG814 also features built-in hacker protection, web content filtering and web browser-based settings.

Internet connectivity and networking in a box

The NETGEAR DG814 incorporates 3 devices in one sleek box: an ADSL modem to connect to the Internet, a NAT Router to share the connection and a 4 port 10/100 Ethernet Switch so that PCs can be directly connected to it.

Easy to install and use

You'll be up and running in minutes with the animated Install Assistant and on-screen help. All you need is a browser.

Security

Protect against hackers using NAT (Network Address Translation) and allow access for up to 253 users at the same time. For extra security, connect using a VPN link.

State of the art web filtering

Control web access and monitor Internet activity using the powerful auditing, logging and reporting features.

To WIN a NETGEAR DG814 and for more info:
www.netgear.co.uk/dg814



PC WORLD
Business

inmac

SIMPLY
www.simply.co.uk

Action
The No.1 Source For Computers and Supplies

Videk

Insight High Tech
Low Cost
Smart Business

GLOBALdirect

dabs.com

MISCO

ebuyer.com
make the right decision

© 2002 NETGEAR. All trademarks belong to their respective owners. Information correct at time of going to press and subject to change. To enter free prize draw, complete your details on web site, no purchase necessary. Ends 31.08.02, no cash or alternative prize, no correspondence can be entered into, winner published on NETGEAR web site. E&OE.
* Please note the NETGEAR DG814 requires an installed ADSL line.

NETGEAR

pcwexpert

Become an expert with our essential, in-depth guide to all things PC



138 HISTORY
140 TECHNOLOGY
148 FUTURE
152 WORKSHOPS

Windows has become the world's most prevalent desktop operating system. This month in *pcwexpert* we investigate its beginnings, see how it has evolved and look towards the next upgrade. We also learn how to configure the XP firewall and how to back up and restore the Registry

ILLUSTRATION David Angel

Windows

Written by Roger Gann and Tim Nott

Windows on the world

From its early beginnings to the launch of XP, Windows has been through a variety of facelifts

Around 1964 Doug Engelbart of the Stanford Research Institute invented the 'X-Y Position Indicator for a Display System'.

It's not recorded which member of his team shortened this unwieldy title to 'mouse', but at the 1968 Joint Computer Conference in San Francisco, Engelbart demonstrated not just the mouse, but online collaboration, video-conferencing and hyperlinks.

His vision of a screen connected to a computer that 'was instantly responsive to every action' inspired everyone – except the manufacturers. It was not until 1973 that the Alto, the first computer with a Graphical User Interface (GUI), was built by Xerox.

In 1981 IBM launched its Personal Computer. Legend has it that IBM, looking for an operating system for its new baby, approached Gary Kildall of Intergalactic Digital Research. Kildall had developed an operating system for the Z80 processor, CP/M, and had facilitated its portability by separating it from the hardware-dependent Bios

(Basic Input/Output System). Gary, the story goes, was flying his plane when IBM called. Dorothy, his wife and business partner, was reluctant to sign IBM's non-disclosure agreement.

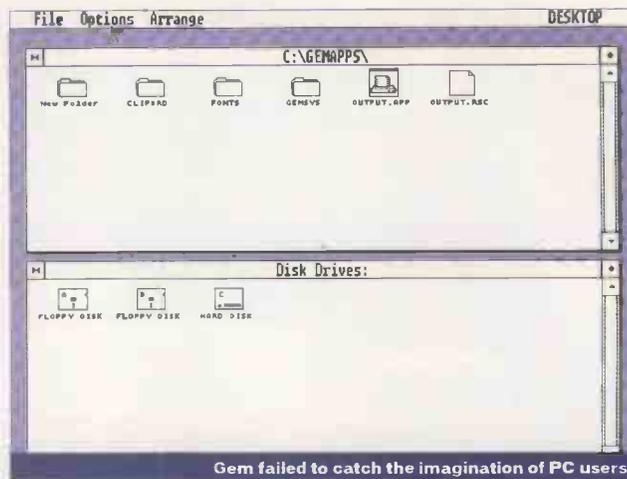
So IBM approached Microsoft. The only problem was that Microsoft hadn't developed an operating system; its business was in programming languages. But the problem was rapidly solved – Microsoft paid \$50,000 to Seattle Computer Products for the rights to their Quick and Dirty Dos (QDdos), which it then licensed – non-exclusively – to IBM.

Flying start

The combination of IBM's clout in the business world, and the fact that the PC clones could be built by other manufacturers, got the machine off to a flying start.

Two years later, Apple launched the Lisa – the first GUI personal computer – followed a year later by the Macintosh. The same year, Kildall, having come down to earth and dropped the 'Intergalactic' from the company name, released Gem – a PC GUI.

This failed to woo the hearts and minds of PC users, with the



notable exception of desktop publishers, where it lasted until the early 1990s as a front end for applications such as Ventura.

The release of the 80286 and 80386 chips brought new capabilities to the PC. The first removed the 640KB memory limit and the second brought multitasking.

So, by the late 1980s, several problems were in search of a solution. The extra memory needed system-level software to access it, and the multitasking capabilities needed an environment in which to run. And as PCs entered the working

lives of more and more users, the demand grew for a friendlier interface.

The first version of Windows shipped in 1985, with now-familiar accessories such as Notepad, Paint and Write; non-overlapping windows; and – unlike the Macintosh – 16 glorious colours.

At that time it was not the multimegabyte application we run today. It shipped on floppy disks and could quite happily run with 640KB of memory on a PC with just a single floppy drive. Just as well, as hard drives were prohibitively expensive.

pcwexpert timeline

1964	1973	1981	1983	1984	1984
					
X-Y Position Indicator for a Display System is invented. This is later renamed the mouse, much to the relief of us all.	Xerox develops the first Graphical User Interface (GUI) and finally the mouse has a use.	IBM develops the Personal Computer and ships it with QDdos from Microsoft.	Apple debuts the Lisa, the first entirely GUI-based personal computer.	The now legendary Macintosh follows the Lisa, and establishes itself as a benchmark for GUI computing.	Digital Research introduces the world to Gem, its Mac OS-like windowed OS for PCs.

The following year saw the arrival of Windows 286, with Windows 386 coming in 1987, but this was still primarily a way of running multiple Dos applications.

What was needed were Windows 'killer' applications. And they came - not just from Microsoft with Excel and Word, but also from third parties such as Corel, Micrografx and Aldus.

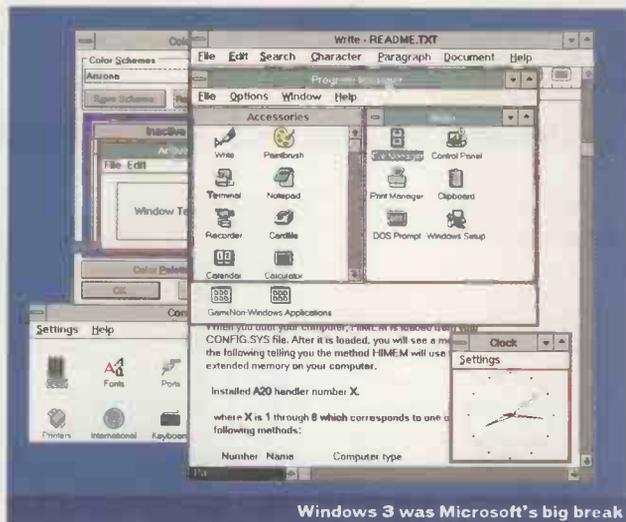
Big break

The big break came in 1990, with the release of Windows 3, which, like its predecessors, ran on top of Dos. Bill Gates was in prophetic mood, foreseeing multimedia, pen and voice recognition and 'a PC on every office desk and in every home' - a vision, economic naivety aside, that seems less far-fetched in retrospect.

On another matter he was well adrift, seeing Windows 3 as a stepping-stone to OS/2, the 32bit OS being developed by Microsoft and IBM. 'People say that OS/2 is not an overnight success. So what? It's Microsoft versus Microsoft versus Microsoft,' said Gates. Shortly after, Microsoft pulled out of the OS/2 project.

Windows 3.1

In April 1992 along came Windows 3.1. The modest point-one increment



Windows 3 was Microsoft's big break

encompassed 'over 1,000 enhancements' - notably the inclusion of multimedia and TrueType fonts.

It sold three million copies in the first two months. Eighteen months later Windows for Workgroups added peer-to-peer networking, and the following year saw the launch of Windows NT 3.1.

Although similar in looks to Windows 3.1 it was based on different (partly OS/2) code and intended for network servers and corporate workstations.

Start me up

The summer of 1995 saw the most hyped event in the history of computing: TV ads featuring the Rolling Stones song *Start*

me up announcing the arrival of Windows 95. This was a 32bit operating system that, once loaded, no longer relied on Dos drivers. A complete new look got rid of the old File and Program Managers, introducing the Taskbar, Explorer and long file names. It sold a million copies in four days.

The Stones' song continued 'You make a grown man cry' - and Windows 95 was not entirely without its problems. The following year a 'Service Release' fixed some bugs and added support for the Fat 32 file system, but NT users had to wait until summer 1996 for their interface makeover in NT4.

Windows 98 integrated web browsing, with a slew of

features that were mostly useless to those with a pay-by-time Internet connection, including news and stock prices as part of the desktop.

More useful spin-offs included the Quick Launch toolbar, versatile folder views and Windows Update, which facilitated applying the numerous patches and fixes available online. Windows 98 also brought support for the Unicode character set, DVD, USB and Win TV.

New versions

The turn of the millennium saw two new versions. Back in the corporate stream, Windows 2000 succeeded NT4, bringing 98-style Internet integration and much-improved support for mobile users.

Later in the year, Windows Millennium edition (ME) catered for home users. 'Real mode' MS-Dos finally disappeared and the self-maintaining aspect of Windows Update was joined by a System Restore feature that, in the event of problems, could undo changes made to the Registry and system files.

Finally, the two streams reconverged in 2001, with the launch of Windows XP. Although this, the current version of Windows, comes in both Professional and Home versions, the two are based on a common kernel.

1985	1990	1991	1992	1995	2001
Microsoft ships the first release of Windows, complete with Notepad, Paint and Write.	Bill Gates launches Windows 3, signalling the death of Gem. The new version of Windows enjoys widespread acceptance.	Windows 3.1 brings us multimedia, TrueType fonts and 'over 1,000 enhancements'. It sells three million copies in two months.	The business world finally gets a Windows release to itself - Windows NT 3.1. This is partly based on OS/2 code.	Windows 95 wipes the operating system floor and introduces the world to the now familiar Start button. It sells one million copies in four days.	Windows XP sees the business and consumer Windows product lines merge once more in a more colourful environment.

Inside the operating room

We dissect Windows and explain how it has evolved into the fast, flexible and sophisticated product we use today

If you've read the history section you'll notice one of the new features in Windows 3.1 was TrueType. Prior to that, Windows came with versions of Times, Courier, Helvetica and Symbol fonts but these were bitmapped – each size of each letter needing a separate image.

Though these looked fine on the screen at the supplied sizes, larger or in-between sizes appeared 'blocky', as did any size when printed. One solution was to use the printer's built-in fonts for printing and substitute a Windows font for the screen, but what you saw bore little relation to what you got. More upmarket printers came with 'soft' fonts generating bitmapped screen fonts to match printer fonts.

A third solution was to buy a type management add-in such as Adobe Type Manager, Facelift or Superprint, which cost as much as – or more than – Windows 3.0, but offered scalable fonts that looked good at any size on screen or in print.

TrueType technology – initially developed by Apple – brought scalable font rendering to the core of the operating system. Rather than being stored as a bitmap, the outline of each letter is stored as a set of vector objects – mathematical entities that can be scaled to any size. The screen or printer driver then 'colours in' the outline. So, if your screen displays at 96 dots per inch (dpi) and your printer outputs at 300, the driver 'rasterises', accordingly, giving true Wysiwyg at the best resolution of either device.

TrueType stores font outlines as Quadratic B-Splines, which are similar to the Bezier curves used in drawing programs, with outline sections defined by control points that shape the curve between its endpoints. When an application requests, for example, a 24point Arial letter B, the outline is brought from the font file then scaled to the appropriate pixel size of the output device: this

calculation is performed to an accuracy of one-sixty-fourth of a pixel.

Pixels whose centres lie inside or on the outline are turned on. The larger the letter relative to the resolution of the output device in pixels per inch, the more pixels are turned on and the finer the character shape becomes.

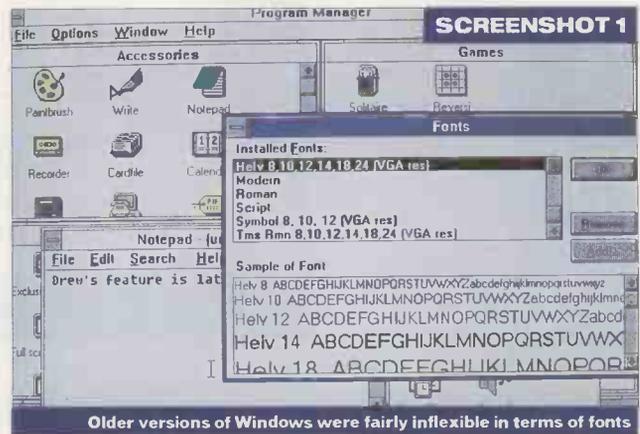
So far, so good, but there's a problem when pixel size approaches the stroke width. A stroke, for example, of just under a pixel width, will disappear if split equally across two adjacent pixels as it will fail to turn either on. So the font file must contain instructions that optimise the display of each letter at low resolutions by 'grid-fitting' it – distorting the shape to optimise the pixel coverage – a process also known as 'hinting'.

Greyscale rasterisation, or font smoothing, was added to TrueType shortly after the launch of Windows 95. Instead of just addressing the on/off state of a pixel in terms of black and white, this uses shades of grey on the curves and diagonals of letters. This smoothes out or 'anti-aliases' the staircase effect caused by rendering diagonals and curves in square pixels.

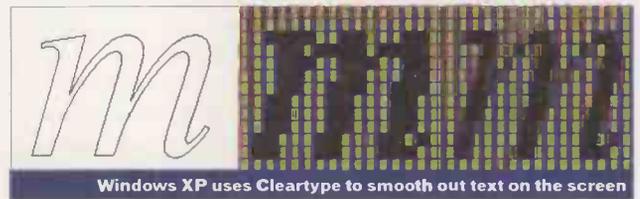
Windows XP takes this a step further with ClearType, designed for the LCD screens in laptops, handhelds and flat-panel monitors. On these screens, each pixel actually consists of red, blue and green sub-pixels. ClearType addresses each of these individually, resulting in smoother looking, more legible text (see picture above). It is claimed this can increase reading speed by 15 per cent.

The Registry

Windows 3.0 stored its settings in a collection of plain-text files with the extension .ini. Typically, hardware settings such as the display and keyboard drivers were stored in system.ini, and software settings such as file associations



Older versions of Windows were fairly inflexible in terms of fonts



Windows XP uses ClearType to smooth out text on the screen

and screen colours were stored in win.ini. Applications would either store settings under a custom section in win.ini or in their own 'private' .ini file.

The consequences were that there was a size limit to .ini files, and applications whose installation bloated win.ini could bring the system to its knees. Also, the proliferation of .ini files in various locations made it a challenge to back up your settings.

Windows 3.1 saw the start of migrating file associations to a 'registration database' and Windows 95 introduced the Windows Registry as a central repository for both Windows and application settings. Win.ini and system.ini have continued to exist, rather like pensioned-off retainers, should a 16bit application need their services. A new category of .ini file surfaced, which we will return to later.

Under Windows 95 and 98, on a single-user system, the Registry consists of two files, system.dat and user.dat. On multi-user machines, each user has their personal user.dat that is read in when they log on. Windows ME adds a third file –

classes.dat. Unlike their .ini ancestors these are not editable text files, but they can all be accessed simultaneously with the Registry Editor, where they appear as a single hierarchical entity split into six main sections. Each section consists of keys and nested subkeys, any of which can contain values. Values can either be text, a variable-length hexadecimal number or a Dword – an eight-digit hexadecimal number.

The first, HKEY_CLASSES_ROOT, corresponds to classes.dat in Windows ME – in earlier versions the contents are part of system.dat. This contains information about various 'objects' in Windows, including OLE (object linking and embedding) links, Windows shortcuts and file associations.

File associations are stored in two parts. For example, the key for .jpg defines it as a 'jpegfile'. On a Windows ME system another subkey points at a separate hexadecimal key identifying the thumbnail viewer. Going down to the jpegfile entry the default value is 'Jpeg image': this is the description you see in Explorer for that file type.

Then there are three further subkeys. The CLSID key is a Class Identifier for an ActiveX module – in this case the one that displays .jpgs in HTML documents. The DefaultIcon key is self evident, and the Shell key contains the commands that you can access when you right-click on a .jpg file, including the application that launches with 'Open'.

HKEY_CURRENT_USER contains settings relevant to the user currently logged in, as stored in the user.dat file. If there is only one user, these will be the same as in HKEY_USER\DEFAULT.

Here you'll find keys for display options, keyboard layout and other Control Panel settings. The Software key is where applications can store per-user settings. These can include, the toolbar arrangements in a program, recent file lists or high scores in games. Many more Windows settings, such as folder arrangements and programs run at start-up, are stored under Software\Microsoft\Windows\Currentversion.

HKEY_LOCAL_MACHINE contains configuration data that is applicable to all PC users, physically stored in system.dat. This includes information on hardware such as monitors, sound cards and USB devices; network settings; time zone information and so on. There is also a Software key here where applications can store non-varying data, such as the location of program files on the hard disk.

It also has a large section devoted to Windows, containing information such as shared network folders and printers, installed fonts and shell extensions, Internet security zones and when drives were last backed up or defragged. This section also contains a duplicate of HKEY_CLASSES_ROOT.

HKEY_CURRENT_CONFIG, the fifth section, is again part of system.dat and is only of interest if you have more than one hardware profile: you might, say, have a laptop that is sometimes plugged into a desktop monitor. This section contains pointers to one of the profiles stored in HKEY_LOCAL_MACHINE.

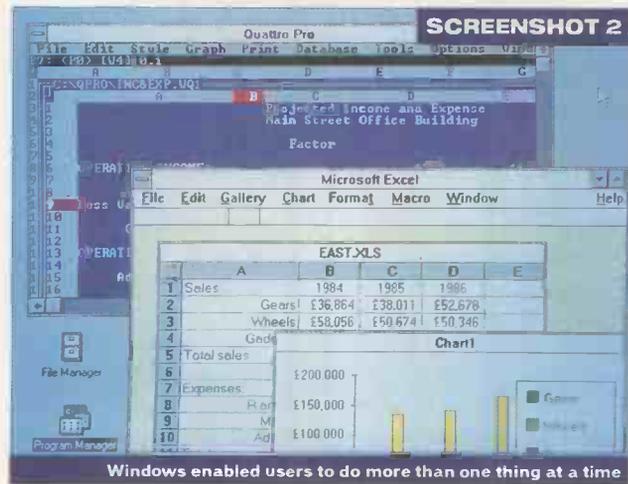
Finally, HKEY_DYN_DATA doesn't point to a file at all – it contains entries that are loaded into memory each time the PC is started for instant access.

Multitasking

An early benefit of Windows was multitasking. Not only could you swap between programs, but the PC could also perform more than one task at a time. Typically, under Dos, if you wanted to print a document on a standalone PC, you couldn't do anything else until printing had finished, which didn't do much for productivity. So, what happens when you hit the Print button in a Windows application? Assuming you are not using a Postscript printer, which uses its own language and protocols, the first thing that happens is that the output is sent to the Graphics Device Interface (GDI) which generates an Enhanced Metafile (EMF). When this is done, control passes back to the application – as far as it's concerned, the printing is done and you can carry on working.

The EMF is a mixture of bitmapped and vector data: if the output, for example, contains a photograph and a green circle, the photo will be encoded as a stream of pixels, whereas the circle will be encoded as a set of instructions – 'draw circle, fill it in with green pixels'.

The EMF is stored as a temporary file which is then processed by the spooler, which interprets the file as a background thread. The output from the spooler is passed to the printer driver in stages: only when



Windows enabled users to do more than one thing at a time

the printer is ready to receive more data is another packet sent.

Printing is a prime example of multitasking, but it isn't the only one. Under Windows 3.x, multitasking was 'co-operative'. This was an honour system in which the operating system relied on the application to check the message queue regularly and give up control to other applications when required. Applications that did not check the queue could hog processor time and prevent the user from running other tasks or using other applications.

Windows 95 and NT introduced 'pre-emptive' multitasking, putting the OS in charge of assigning or taking away control from applications. Each process (a program or window, for example) also has one or more threads running, each thread being a unit of code that can be run concurrently with other threads.

For example, if you open two folders each runs as a separate

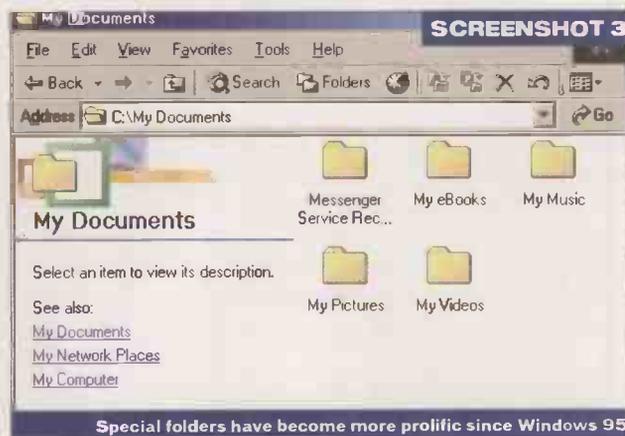
thread, although they are part of the same Windows Explorer process. If you copy files from one to the other the target window thread does the work, but you can still initiate other copies or navigate up or down from the source window.

Special folders

With the launch of Windows 95, the word 'directory' was replaced by 'folder'. This was more than just clever marketing, as folders can do much more than just store files. Windows has several 'special' folders that perform various tasks, and some folder objects that look and behave like directories but aren't.

Take, for example, the Fonts folder. Although this corresponds to a directory that can be seen from a Dos prompt or from the 16bit File Manager, it has menu items and commands not seen in other folders, such as 'Install new font' on the File menu and customised view icons.

Taking another example, the Recycle Bin; though it looks like a folder, it doesn't exist as a visible directory under Dos at all. Instead its contents correspond to a directory or directories named 'Recycled' – one for each hard drive or partition. Opening one of these in Explorer shows the same contents as the Recycle Bin itself, apparently duplicating the entries over each drive. Examining the directories in Dos reveals that each contains renamed versions of the files and folders that have been binned from that drive only.



The answer to this mystery is that there are two hidden files in each Recycled directory. One contains a table of the original names and paths of the binned files or folders on that drive only. The other is the key to the enigma: the new generation of .ini files we mentioned in the Registry section. Special folders contain a file named desktop.ini. As with the Windows 3.x generation of .ini files, these are in plain text. They can be used to customise folders in all sorts of ways, but their powers go far beyond the cosmetic.

A Class Identifier, which appears as groups of hexadecimal numbers inside curly brackets, points to a Registry entry that defines how the folder will behave – in the case of the Fonts folder

linking it to the relevant code in fontext.dll, and in the case of the Recycled folders redirecting the view of their contents to the Recycle Bin object. Special folders have proliferated since their introduction in Windows 95 – in Windows ME you have My Music, My Pictures as well as My Documents, History and Favourites. Windows Media Player also uses desktop.ini files to enable album thumbnails and information for music files (see screenshot 3).

Memory management

As we saw in the history section, the advent of the 80286 processor did away with the memory limit for PCs, but Dos could still only address 640KB of the total installed memory.

It was possible to use extra memory as a Ram disk, fooling the OS into seeing the extra memory as a very fast but temporary disk drive.

This had its uses, particularly on floppy-only systems, where programs from one or more floppies could be copied to the Ram disk at start-up. This technique is still used by the Startup Disk in Windows 98 and ME. However, it didn't solve the problem of making the memory available to run programs, so two workarounds evolved. Expanded memory used the physical memory between 768KB and 960KB as a 'Page Frame' for high memory: pages were loaded in and out of the window rather like slides in a projector. Extended memory

could be addressed directly by the processor.

Though rival advocacy was fierce, the Extended Memory Specification (XMS) standard developed by Lotus, Intel, Microsoft and AST, prevailed over the expanded Lim standard, curiously enough developed by Lotus, Intel and Microsoft.

It was still a kludge, though, as the XMS driver, himem.sys, had to be loaded from Dos before Windows was loaded. Windows 95 did away with the need to have an explicit himem.sys in the Dos config.sys file – in fact it didn't need the latter at all, as himem.sys was automatically loaded by Windows.

But having gained access to the memory, the problem remains as how best to use it.

NTFS has more...

Fault tolerance

NTFS repairs hard disk errors automatically without displaying an error message. When XP writes a file to an NTFS partition, it keeps a copy of the file in memory. It then checks to make sure this matches the copy stored. If the copies don't match, Windows marks that section of the hard disk as bad and won't use it again. This is known as Cluster Remapping. Windows then uses the copy stored in memory to rewrite the file to an alternate location on the hard disk. If the error occurred during a read, NTFS returns a read error to the calling program, and the data is lost.

Reliability

NTFS is a 'journaling' file system. NTFS keeps a write-ahead log file of all changes made to the hard disk. If something bad happens to the system in the midst of a write to the disk, NTFS can resume the operation automatically as soon as the operating system is running again. Under the Fat file systems, this would result in file system or disk corruption. When a CHKDSK is performed on Fat 32, the consistency of pointers within

the directory, allocation, and file tables is checked. Under NTFS, a log of transactions against these components is maintained so CHKDSK need only roll back transactions to the last commit point to recover consistency within the file system, making NTFS more reliable.

Security

NTFS is a highly secure file system – you can grant various permissions to directories and individual files. These permissions protect files and directories locally and remotely. Every file in NTFS has an Access Control List (ACL). That means you can create user-based security for every file on your computer. NTFS also includes the Encrypting File System (EFS), which uses 'public-key' security to encrypt files on an NTFS volume, preventing unauthorised users from accessing those files. Encryption is even preserved in backups – useful on notebooks and shared machines.

Storage efficiency

NTFS is more efficient at storing files than Fat 32 – you'll use less space on the disk storing 1,000 typical files under NTFS – the larger your hard disk, the truer it is.

Drive performance

As drive sizes and the sheer number of files on a partition increase, NTFS' performance doesn't degrade. There are also performance improvements on boot times. But on very large disks, the small cluster size results in millions of clusters, which means more time managing them.

File compression

Although Drivespace may be dead and buried, NTFS does offer native support for file compression. The NTFS compression offers you the chance to compress individual files and folders.

Disk quotas

Disk quotas allow administrators to manage the amount of disk space allotted to users, charging only for the files they own. This is transparent; the user simply sees the disk space available to them.

Link tracking

With NTFS in XP, a shortcut link will not be broken if you move the target file, as it was in Windows 98. Thanks to its Distributed Link Tracking Client, file shortcuts can be updated by automatically searching for the new location of the target file.



XLShop.com

The Best Prices in the Digital World

100's more great offers at www.xlshop.com
NEW - SOFTWARE SPECIALS - look online

XLent Choice • XLent Prices • XLent Service

EPSON Ink Cartridges & Compatible Ink Cartridges

	Epson Single	Print-Rite Single 3 Pack
S020025 Epson Stylus Color/800/800+/1000	Black £7.80	£2.40 £6.79
S020034 Epson Stylus Color/Pro/Pro XL/Pro XL+	Black £8.85	£2.39 £6.49
S020036 Epson Stylus Color/Pro/Pro XL	3-Colour £16.35	£3.39 £9.19
S020039 Epson Stylus Color/800/800+/1000	Black £14.80	
S020047 Epson Stylus 200/820/Color II/Color IIs/Color 200	Black £9.89	£2.39 £6.49
S020049 Epson Stylus 820/1500/Color II/Is	3-Colour £13.69	£3.39 £9.19
S020062 Epson Stylus 1500	Black £33.50	£3.89 £10.49
S020066 Epson Stylus Pro XL+	3-Colour £21.10	£3.39 £9.19
S020089 Epson Stylus Color 400/600/800/850/1520	3-Colour £12.75	£3.39 £9.19
S020093 Epson Stylus Photo 700/Photo/Photo EX/Color 400/500/600	Black £12.35	£2.39 £6.49
S020097 Epson Stylus 200/Color 200/500	3-Colour £13.65	£3.39 £9.19
S020108 Epson Stylus Color 800/850/1520	Black £12.45	£2.39 £6.49
S020110 Epson Stylus Photo 700/Photo/Photo EX	5-Colour £9.65	£3.89 £10.49
S020138 Epson Stylus Color 300	4-Colour £9.75	£3.39 £9.19
S020187 Epson Stylus Color 440/460/640/660/670/1200/Photo 750	Black £11.40	£2.39 £6.49
S020189 Epson Stylus Color 740/760/860/1160	Black £13.60	£2.39 £6.49
S020191 Epson Stylus Color 440/460/640/660/670/740/760/860/1160	3-Colour £13.10	£3.39 £9.19
S020193 Epson Stylus Color 750	5-Colour £9.80	£3.89 £10.49
T001011 Epson Stylus Photo 1200	5-Colour £13.85	£3.89 £10.49
T003011 Epson Stylus Color 900/980	Black £14.80	£2.39 £6.49
T005011 Epson Stylus Color 900/980	3-Colour £17.45	£3.39 £9.19
T007401 Epson Stylus Photo 790/870/875DC/890/895/Color 1270/1290	Black £11.20	£5.49 £16.00
T008401 Epson Stylus Photo 790/870/875DC/890	5-Colour £10.40	£6.30 £17.49
T009401 Epson Photo 1270/1290	5-Colour £12.45	£6.70 £19.50
T010401 Epson Photo 790/870/875DC/890/1270/1290	Black £7.40	
T013401 Epson Stylus Color 480/580/C20/C40	Black £9.45	£2.39 £6.49
T014401 Epson Stylus Color 480/580/C20/C40	3-Colour £12.20	£3.89 £10.49
T015401 Epson Stylus Photo 2000P	Black £16.70	£6.59 £18.99
T016401 Epson Stylus Photo 2000P	5-Colour £17.80	£8.75 £25.49
T017401 Epson Stylus Color 680	Black £16.75	£7.79 £22.19
T018401 Epson Stylus Color 680	3-Colour £13.90	£6.85 £18.99
T019401 Epson Stylus Color 880	Black £15.95	£2.45 £6.89
T020401 Epson Stylus Color 880	3-Colour £14.15	£3.89 £10.49
T026401 Epson Stylus Photo 810	Black £13.90	£6.85 £18.99
T027401 Epson Stylus Photo 810	5-Colour £11.45	£6.89 £18.99
T028401 Epson Stylus C60	Black £17.90	£4.95 £14.50
T029401 Epson Stylus C60	3-Colour £15.80	£6.85 £18.99
T032140 Epson Stylus C70/C80	Black, Pigment £17.85	£6.95 £19.89
T032 Epson Stylus C70/C80	Cyan, Magenta or Yellow Pigment	£9.70 £5.80 £16.80

SPECIAL OFFERS

Print-Rite Compatible Ink Cartridges for

Epson Stylus Photo

790/870/875DC/890/895/Color 1270/1290

Black 7401 Single £5.49 3 pack £16.00

790/870/875DC/890 5-Colour 8401 Single £6.30 3 pack £17.49

1270/1290 5-Colour 9401 Single £6.70 3 pack £19.50

PRINT-RITE logo

HEWLETT PACKARD Ink Cartridges

51625A DeskJet 310/320/340/400/400L/420C/500C/540/550C/560C Tri-colour	£23.40
51626A DeskJet/Plus/400/400L/420C/500C/510/520/540/550C/560C Black	£17.95
51626G DeskJet/Plus/400/400L/420C/500C/510/520/540/550C/560C - low cap Black	£14.90
51629A DeskJet 600/660C/670C/690C/695C/Black	£17.95
51633M DeskJet Portable/DeskJet 300 Series/DeskWriter 300 series Black	£17.80
51641AE DeskJet 820Cxi/850C/870Cxi/1100C/OfficeJet 1150 Tri-Colour	£23.40
51645AE DeskJet 710C/720C/815C/820Cxi/850C/870Cxi/880C/890C/895Cxi/930/950/970/980/990 Black	£17.95
51645G DeskJet 710C/720C/815C/820Cxi/850C/870Cxi/880C/890C/895Cxi/930/950/970/980/990 - low capacity Black	£14.90
51649A DeskJet 350C/350Cxi/600/610C/640C/660C/670C/690C/695C Tri-colour	£17.95
51649N DeskJet 350C/350Cxi/600/610C/640C/660C/670C/690C/695C - low cap Tri-colour	£14.90
C1816A DeskJet 610C/640C/690C/695C & OfficeJet 700/710/725 Tri-colour	£23.40
C1823DE DeskJet 710C/720C/810C/815C/880C/890C/895Cxi/1120C/1125C Colour	£23.40
C1823G DeskJet 710C/720C/810C/815C/880C/890C/895Cxi/1120C/1125C - low cap Colour	£19.10
C6578AE DeskJet 930/950/970/980/990/1220C/1220C/PS Tri-colour	£39.90
C6578DE DeskJet 930/950/970/980/990/1220C/1220C/PS - low capacity Tri-colour	£23.90
C6614D DeskJet 610C/640C & Fax 925xi Black	£17.85
C6614N DeskJet 610C/640C & Fax 925xi - low capBlk	£16.50
C6615DE DeskJet 810C/840C/843C & PSC500 Black	£17.95
C6615N DeskJet 810C/840C/843C & PSC500 - low capacity Blk	£16.80
C6625A DeskJet 840C/843C Tri-colour	£17.90
C6657A PhotoSmart 100 photo printer Tri-colour	£27.50

Canon Ink Cartridges

BC-01 Canon BJ-10sxi/BJ-10ex/BJ-10e Mono	£13.80
BC-02 Canon BJ10e/BJ-10ex/BJ-10sxi/BJ-20/BJ-20ex/BJ-200ex/BJ-230/BJC-150/BJC-210/BJ-230/BJC-240/BJC-250/BJC-1000 Black	£13.65
BC-05 Canon BJC-150/210/240/250/1000 Colour	£16.85
BC-06 Canon BJC-240/BJC-250/BJC-1000 Photo	£13.85
BC-10 Canon BJ-30/BJC-50/BJC-70/BJC-80/BJC-85 Blk	£17.85
BC-11e Canon BJC-50/BJC-70/BJC-80/BJC-85/StarWriter Jet 550C Col	£34.99
BC-20 Canon BJ-S100/BJC-2000/BJC-2100/BJC-4000 Series/BJC-5500 Mono	£17.85
BC-21e Canon BJC-2000/BJC-2100/BJC-4000 series/BJC-5000/BJC-5100/BJC-5500/BJC-S100 Col	£29.85
BC-22e Canon BJC-2000 series/BJC-4200/BJC-4300/BJC-4400 Photo/BJC5000/BJC-5100 Photo	£15.90
BC31e Canon BJ-S450/S4500/BJC-6000 series Col	£22.90
BC61 Canon BJC-7000/BJC-7100 Black	£17.90
BC61 Canon BJC-7000/BJC-7100 Colour	£17.90
BC62e Canon BJC-7000/BJC-7100 Photo	£30.70
BC109K Canon BJC-30/50/70/80/BJ-85 Black	£8.80
BC111BK Canon BJC-30/50/70/80/BJ-85 Mono	£5.90
BC111C Canon BJC-30/50/70/80/BJ-85 Colour	£9.80
BC121Bk BJ-S100/BJC-2000/BJC-2100/BJC-4000 series/BJC-5000/BJC-5100/BJC-5500 Black	£4.60
BC121C BJ-S100/BJC-2000/BJC-2100/BJC-4000 series/BJC-5000/BJC-5100/BJC-5500 Colour	£9.80
BC13e Canon BJ-S400/BJ-S450/BJ-S4500/BJC-3000/BJC-6000 series Black	£6.89
Cyan/Magenta/Yellow	£5.80
Photo Black/Photo Cyan/Photo Magenta	£7.99
BC16 BK/C/M/Y Canon BJ-S800/BJC-8200 Photo Black/Cyan/Magenta/Yellow	£6.05
BC16CPM Canon BJ-S800/BJC-8200 Photo Photo Cy/Photo Mag	£6.45

Full Canon Cartridge Range Available - Call for Details

Canon Inkjet Papers

CF-1024A A4 Transparencies (50)	£29.20
FM-101 Glossy Photo Cards - 101.6x152.4mm (20)	£5.10
GP301A3 A3 Glossy Photo Paper (20)	£16.99
GP301A4 A4 Glossy Photo Paper (20)	£6.80
HG-201A4 A4 High Gloss Photo Film (10)	£17.99
HR-101A4 A4 High Resolution Paper (50)	£4.89
HR-101A4 A4 High Resolution Paper (200)	£16.40
LC-101A3 A3 Coated Paper (200)	£47.99
LC-301A2 A2 Bubble Jet Paper (100)	£20.10
LC-301A3 A3 Bubble Jet Paper (200)	£29.99
LC-301A4 A4 Bubble Jet Paper (50)	£3.49
LC-301A4 A4 Bubble Jet Paper (200)	£13.49
LC-301BP Banner Paper (50)	£4.49
PC101S Photo Paper Pro - 101.6 x 152.4mm (15)	£8.99

Canon Ink Cartridges Compatible/Recycled

ALP-BC01 Mono	£9.89	PRT-BC130C/M/Y/PM/	
ALP-BC02 Black	£9.39	PC/Photo Blk each	£3.50
PRT-BC10BK Black	£4.89	PRT-BC161C Colour	£7.89
PRT-BC11BK Mono	£5.79	PRT-BC162 Photo	£8.89
PRT-BC111C Colour	£7.50	PRT-BC15BK Black	£3.89
PRT-BC12BK Black	£2.69	PRT-BC15CMY CM/Y/£3.89	
PRT-BC121C Colour	£3.89	PRT-BC16CPM Photo	
PRT-BC13BK Black	£3.90	Cyan Ink/Photo Mag	£3.95

LEXMARK Ink Cartridges

LEX-12A1970	Black	£17.90
LEX-12A1980	Colour	£25.80
LEX-12A1990	Photo	£25.80
LEX-10N0016	Black	£17.99
LEX-10N0026	Colour	£17.99
LEX-17G0050	Black	£17.80
LEX-17G0060	Colour	£17.80

EPSON Inkjet Papers

S041054 A6 Photo Quality Inkjet Card (50)	£5.75
S041059 A4 360dpi Inkjet Paper (100)	£6.19
S041061 A4 Photo Quality Inkjet Paper (100)	£7.30
S041063 A4 Transparency Media (30)	£27.90
S041071 A4 Photo Quality Glossy Film (15)	£16.85
S041106 A4 Photo Quality Self-Adhesive (10)	£7.40
S041107 A6 Photo Quality Glossy Film (10)	£3.89
S041121 Photo Qual. Inkjet Card - 127x203.2mm (30)	£4.80
S041122 Photo Qual. Inkjet Card - 203.2 x 254mm (30)	£9.90
S041126 A4 Photo Quality Glossy Paper (20)	£4.95
S041134 6 x 4 inch Perforated Photo Paper (20)	£3.75
S041140 A4 Photo Paper (20)	£6.40

IBM Inkjet Papers

TOP BRAND - FANTASTIC VALUE	
Inkjet Photo Paper 6x4 180g (25)	
A4 Transparencies (25)	£4.99
A4 Photo Inkjet Paper 180g (20)	£4.55
A4 Gloss Coated Inkjet Paper 130g (50)	£7.79
A4 Matte Coated Inkjet Paper 100g (100)	£4.99
A5-A6 Gloss Coated Inkjet Greeting Cards & Env. 180g (30)	£4.99
A4 Multi-Purpose labels 120g (30)	£3.69
A4 Iron on Inkjet T-Shirt Transfer 130g (10)	£6.19
A4 format Matte Coated Business Cards 210g (10x10)	£2.19
IBM CD/DVD labelling kit	£8.70
A4 format Regular white CD labels - 30 labels, 70g	£2.89
A4 format Hi Res white CD labels - 30 labels, 90g	£6.35
A4 format White Photo Gloss CD labels - 30 labels, 85g	£8.80
A4 format Jewel case inserts - 25 jewel cases 160g	£4.79

S041144 A6 Photo Sticker Paper (5)	£3.90
S041147 A6 Photo Qual. Inkjet Notecards w/envs (20)	£5.90
S041148 Photo Qual. Inkjet Card w/envs - 127x203.2mm (10)	£5.55
S041149 Photo Qual. Inkjet Card w/envs - 203.2x254mm (10)	£8.95
S041150 A4 Inkjet Cleaning Sheets (3)	£2.95
S041154 A4 Iron On 'Cool Peel' T-Shirt Transfer Med. (10)	£8.40
S041176 A6 Photo Sticker Paper (5)	£3.95
S041177 A4 Photo Paper Cards (10)	£4.60
S041214 A4 Premium Inkjet Plain Paper (250)	£3.20
S041254 200 x 300mm with perforation Photo Paper (10)	£6.95
S041255 100mm x 150mm Photo Paper (20)	£4.70
S041256 A4 Matte Paper - Heavyweight (50)	£7.35
S041287 A4 Premium Glossy Photo Paper (20)	£8.60
S041303 100mm x 8m Premium Glossy Photo Paper Roll	£11.80
S041332 A4 Premium Semigloss Photo Paper (20)	£9.10
S041342 A4 Archival Matte Paper (50)	£9.80
S041442 A4 Bright White Inkjet Paper (500)	£8.90
S041560 A4 ColorLife™ Photo Paper (20)	£11.70

JR Inkjet Refill System

Call for details and prices

Digital Memory

SMARTMEDIA - SAMSUNG	INT-CF64 64Mb	£24.99
SAM-SM16 16Mb	INT-CF128-0 128Mb	£45.20
SAM-SM32 32Mb	INT-CF256 256Mb	£89.90
SAM-SM64 64Mb		
SAM-SM128 128Mb		
MULTIMEDIA CARDS - INTEGRAL	INT-MM16-0 16Mb	£16.45
COMPACTFLASH CARDS - INTEGRAL	INT-MM32-0 32Mb	£19.75
INT-CF16 16Mb	INT-MM64-0 64Mb	£44.90
INT-CF32 32Mb		
READERS full range - call		

HEWLETT PACKARD InkJet Papers

51634Z Premium A4 Inkjet Paper (200)	£10.85
C1821A Banner Paper (5)	£7.65
C1825A Bright White A4 Paper (500)	£6.80
C1847A Two-sided, Glossy/Matte, A4 Photo Paper(20)	£5.89
C1853A A4 Premium Heavy-weight Paper (100)	£10.45
C1856A A3 Premium Inkjet Paper (100)	£19.00
C1858A A3 Bright White Inkjet Paper (200)	£17.00
C3831A Premium Glossy A4 Paper (10)	£7.70
C3832A Premium A4 Transparency Film (20)	£11.75
C3835A Premium Inkjet A4 Transparency Film (50)	£29.10
C3837A Premium A4 Glossy Paper (50)	£31.42
C5977B Bright White A4 Paper (250)	£5.05
C6040A Premium A4 Glossy Photo Paper (15)	£5.89
C6042A Matt White Greeting Cards (20)	£4.90
C6045A Glossy White Greeting Cards (10)	£5.80
C6050A A4 T-Shirt Iron-On Transfer Paper (10)	£10.80
C6059A Premium A3 Glossy Photo Paper (20)	£27.20
C6818A A4 Brochure and Flyer Paper (50)	£8.40
C6821A A3 Brochure and Flyer Paper (50)	£18.50

HP Recycled Ink Cartridges

ALP-51625A Colour	£12.79	ALP-51640CMY CM/Y/£12.99	
ALP-51626A Black	£9.89	ALP-51645A Black	£9.90
ALP-51629A Black	£10.40	ALP-51649A Colour	£13.95
ALP-51633M Black	£9.89	ALP-C6614D Black	£10.70
ALP-51640A Black	£12.99	ALP-C6615D Black	£11.69

ALL PRICES INCLUDE VAT

P&P only £1.95 per order

ORDER ONLINE OR BY PHONE

Tel: 0870 085 1111

Phone lines open Mon - Fri 9am - 5.30pm

www.XLshop.com

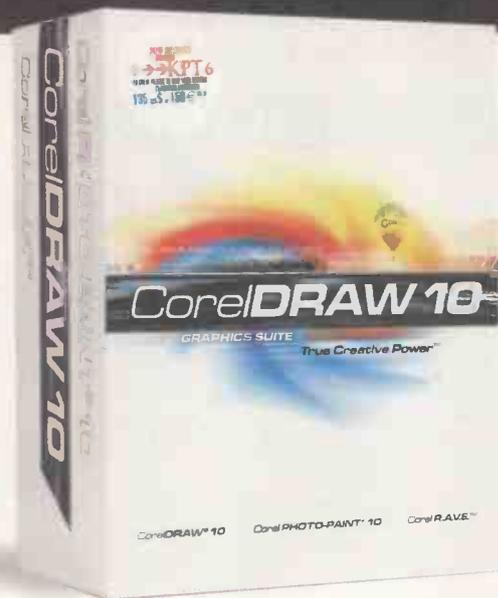
Fax: 0870 085 1113

Email: info@XLshop.com

100% Satisfaction Guarantee

Prices subject to change without notice. E&OE. Please visit the website for the most up to date prices. All trademarks acknowledged.

The **BEST** just got **BETTER**



New release **Now includes KPT® 6**

The new release of CorelDRAW®10 Graphics Suite is our most powerful software package yet. It delivers page layout, illustration editing, vector animation, painting and now an additional 10 effects filters.

- **CorelDRAW®10** – expert layout and illustration with new Real Time Preview, Page Sorter, Macromedia Flash support and file format support – plus enhanced Publish to PDF 1.3.
- **CorelPHOTO-PAINT®10** – dynamic image editing and painting with interactive tools and new Smart Blur, Text-on-a-Path and Top-Hinted Anti-Aliasing, plus real-time zooming and panning.
- **CorelR.A.V.E.™** – a powerful animation application that lets you create live effects over time and roll over graphics, generate a time line of edited work and output images to Macromedia Flash.
- **Now KPT®6** – a remarkable set of image filters that produce effects for both print and Web; Includes 10 plug-ins that extend and enhance your creative possibilities.



www.corel.com

Copyright © 2002 Corel Corporation. All rights reserved. Corel, CorelDRAW, Corel PHOTO-PAINT, Corel RAVE and the Corel logo are trademarks of Corel Corporation or the Corel Corporation Limited US and/or other countries.

Available from
amazon.co.uk

jungle
.COM
Ph: 0800 0355355

PC WORLD
Business
Ph: 08701 664 664

Insight
Ph: 0800 333 333

MISCO
Ph: 0870 720 8720

Loads

of downloads.

From the hottest movie screensavers to browser upgrades and plug ins.

Get your hands on the latest utilities to optimise your PC, or the best e-commerce solutions for your business.

If it's downloads that you're after, we have hundreds of them at www.vnunet.com

technology news, reviews and downloads. get it while it's hot.



One way of speeding up a PC is to use disk caching: setting aside part of memory as a temporary store for data read from – or waiting to be written to – the hard disk. If that data is needed again, the OS looks first in the cache – where it can be accessed more quickly. Windows 3.0 used another Dos driver – Smartdrive – to create a disk cache.

This began to be phased out in Windows 3.11 in favour of the native Windows 32bit Vcache, which replaced it in Windows 95. Vcache can dynamically change its size, grabbing hold of any spare memory and releasing this on demand. This answers the frequently asked question 'where's all my memory gone?' It's on loan to Vcache. If an application is cached, Vcache can also run that application straight from within the cache, without having to uncache it into the main memory – a technique known as cache mapping.

Having used memory as disk space, the next step is to use disk space as memory. Before we consider how this is done, it's worth considering why. The idea of using relatively cheap disk space as if it were expensive memory goes back beyond personal computing to the early days of mainframes.

Although the price of both memory and disk space has dropped dramatically, the latter is still cheaper by a factor of 20 or so. Virtual memory, as it is called, is still used in Windows, enabling the user to run more programs and load bigger files. When a program is being run, parts of the code are swapped out to the hard disk on a least-recently-used basis. If a call is made to program code that's no longer in physical Ram then a page fault occurs. Despite the name, this isn't a problem, but a signal to the virtual memory manager to pull the code off the hard disk, and swap some other code out. All this happens transparently, and the only thing you'll notice is hard disk activity.

Windows uses a swap file as virtual memory, and controls its size on the fly. Though it is possible for the user to specify

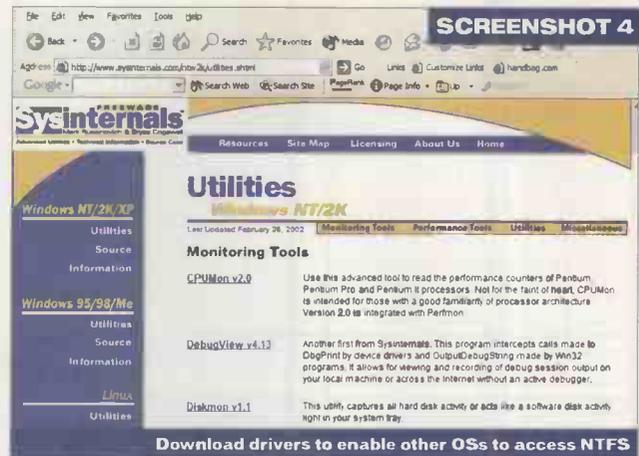
maximum and minimum sizes for the swap file, it is generally best to let Windows take care of this. One exception is that if you have multiple drives or partitions, it is worth specifying the fastest or least used to host the swap file.

One problem with Windows 3.x was that, no matter how much memory you had installed, your system could still grind to a halt with 'Out of memory' messages, slow screen refresh and disappearing buttons and icons. The cause lay in the User and GDI (graphics device interface) heaps. The former stores menus, buttons and controls for active windows and the latter stores cursors and icons. The problem was that these heaps were limited to 64KB, and when they became full, the PC ran out of 'resources' and exhibited the symptoms above, even with plenty of reported free memory. In theory you could regain resources by closing down programs, but this wasn't always effective, as some applications 'leaked' resources – that is, they didn't return them when closed.

The solution was to restart the OS. Windows 95 went a long way to alleviating the problem, with an unlimited GDI heap for 32bit programs, but leaked resources can still be a problem with badly behaved programs and those designed to run under 3.x.

Windows XP

One of the biggest changes brought by Windows XP was a high-performance, file system – the New Technology File System (NTFS) (see boxes). Originally



introduced with NT, NTFS is a significant improvement over the Fat 32 file system. NTFS is more secure, efficient, as fast as Fat 32 on typical drives and is extensible, which could make it more useful in the future. One of the big problems with Fat 32, however, is that it doesn't scale well. The larger the volume size in Fat 32, the larger the cluster size. At 64GB, Fat 32 moves up to 16KB clusters. Even a 512byte file uses 16KB of space just to exist under Fat 32 on a 64GB volume. That means Fat 32 does not store data efficiently on larger volumes. By contrast, NTFS is able to keep to its 4KB cluster size default even on huge disk volumes. NTFS also stores files that are less than 700bytes in the Master File Table, where they displace 1KB instead of 4KB, improving storage efficiency. No other Windows file system stores files as efficiently, especially on large disk volumes.

NTFS supports very large hard disks, up to 2TB in practice but it

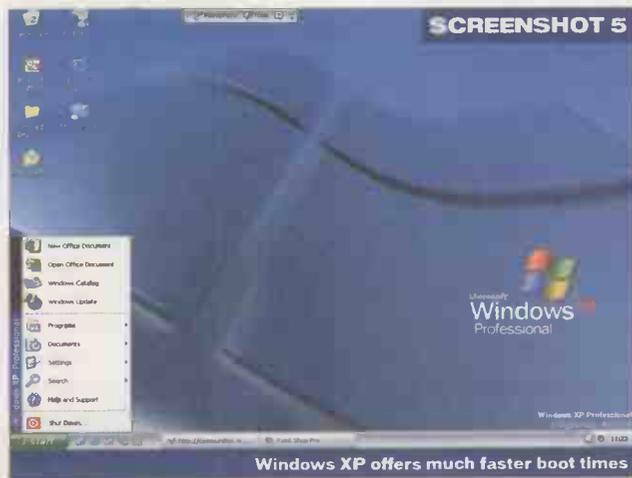
has a theoretical limit of 16 exabytes (one exabyte = one billion gigabytes). It also supports Unicode, and natively supports long file names. NTFS can be accessed by NT, 2000 and XP. Other OSs can access it using third-party device drivers, such as those available from Sysinternals (see screenshot 4) www.sysinternals.com/ntw2k/utilities.shtml.

XPerformance

Windows XP is faster at booting and loading applications than its predecessors. It uses innovative technology in three areas to achieve this: the Bios, prefetching and defragmentation.

Slow boot times or 'boot delays' are a frequent complaint. There are many factors that affect boot time such as memory checks, hardware discovery and driver loading, all of which add to 'the experience'. Over the past few versions of Windows, Microsoft has worked with Bios vendors to minimise boot delays by eliminating unnecessary processes. With XP, Microsoft has set boot time goals for PC manufacturers to achieve: cold boot to usable state: 30 seconds, resume from hibernate: 20 seconds and resume from standby: five seconds.

Changes in the kernel have made it easier for PC vendors to achieve these goals. The first time saver is support for the Simple Boot Flag (SBF) spec. This is a simple Cmos Bios register that is set after Windows boots for the first time, and can shorten subsequent boot times. XP isn't



the first OS to use SBF, as ME and 2000 both set the flag. The SBF holds three bits that identify the OS as Plug and Play (PnP), if the last boot was successful and if diagnostics need to be run.

The PnP bit is important in optimising boot time. When set, it tells the Bios to only configure the devices it needs to boot. So, it saves time by ignoring other resources. In fact, if the Bios does boot as a non-PnP legacy system it can limit the ability of Windows to reassign resources.

The booting bit is set by the Bios when it passes control to the OS. If the OS successfully boots, it clears this bit. If the OS boot fails, the bit is left set and the Bios assumes a failed boot and sets the Diagnostics Bit. This forces the Bios to run Post (power on self test) diagnostics on the next boot. But if the boot was good, this bit is cleared and the diagnostics skipped. The Bios will then transfer program execution to the boot sector.

Not only does this avoid Post, but it can avoid memory tests, start disk spin-up early, optional Rom initialisation, logo screens and the floppy disk check. On the second booting of XP, you will see the effect, even before Windows starts to boot. Depending on the speed of your PC, this can shave precious seconds off the boot time.

Prefetching

The XP boot loader has been rewritten to incorporate parallel 'prefetching' of the code it needs. It gives a shopping list to the File I/O system, which in turn brings in large chunks of data from multiple files in overlapping requests. XP brings in boot and shell code, as well as device drivers and Registry settings.

Prefetching isn't confined to the boot process either: as individual programs are launched, Windows keeps track of when files and components are accessed. The next time the application is accessed, Windows prefetches the items to expedite the application's launch. The prefetch optimising code exists both within the XP kernel and the task scheduler service. The kernel

keeps track of pages that are referenced by a given process immediately after the process is created. The service transforms the recorded pages into prefetch instructions for that process. The next time the process is created, the kernel executes the prefetch instructions, speeding up the creation of the process.

Disk optimisation and application/boot prefetching work in tandem: when XP defragments the file system for faster program access, the data it recorded for the application and bootup prefetch processes is factored in to determine optimal file placement on the disks.

The Prefetcher is enabled by default, but you can tweak its performance. Simply navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\SessionManager\MemoryManagement\PrefetchParameters in the Registry and find the value EnablePrefetcher. Most likely, it will be set to 3, so you might like to increase the value to 4 or 5.

XP also prioritises driver loading to provide a usable desktop. Protocol binding for network devices is done in parallel and can improve boot time, especially if negotiating with hubs and routers, or if the cable is unplugged from the network card.

Converting to NTFS

There are two ways to convert to NTFS. The first is during installation, where you'll be asked both what partition you want to install to and if you want to format that drive with NTFS or use the existing file system. The second option is then available - the command-line Convert utility. To access it, open the Command Prompt window. To get more information about this tool, type `Convert /?` To use it, close all applications, and it may also require a reboot. Click Start, Run, and then type `cmd` and press Enter. In the command windows, type `convert D: /FS:NTFS` and press Enter. If there are open files on the volume being converted, you'll have to reboot. And if this is a large drive with lots of files, the process could take a while.

While the Convert utility works well it's not a perfect solution. It can lead to a fragmented Master File Table (MFT) which is the rough equivalent of Fat 32's File Allocation Table, and slow down the system. Sadly the disk defragmenters supplied with XP (and 2000) don't defrag the MFT and so you'd need to invest in a third-party defragmentation utility. In cases such as this, Microsoft recommends performing the conversion at the outset, preferably on a blank partition.

When you first boot XP, it monitors the drivers, startup applications, Registry entries and shell code being loaded and saves information about prior logical disk read operations. On the second boot, Windows pre-loads drivers and code asynchronously in parallel into memory, ahead of them being requested or used, effectively caching them.

Windows keeps track of your last eight boots and applies heuristics on what to prefetch. In previous versions of Windows, boot files and drivers would load serially - one after another. Since much of the delay in boot time was the physical loading into memory, prefetching saves time.

Defragmentation

Windows XP also dynamically rearranges the layout of files on the hard disk to accelerate loading. When XP prefetches a driver or application, it will try to load the whole file in one go. Saving disk seek time is critical as it's an expensive operation in terms of processor cycles.

When a file is fragmented, portions of program code and data that will ultimately be loaded into memory in 4KB chunks (aka memory pages) are stored in different locations on the drive. Each request for code or data absent from memory requires a physical disk access.

The disk I/O system looks in the file allocation tables to find the required code or data in a file on the hard drive, and then 'seeks' it on the right disk location.

If data is laid out contiguously on the hard drive, when the file is small enough it can be loaded in one operation. If it's bigger than the file buffer, then it's read in successive disk reads. By having the data in one contiguous file, only a single multitrack seek might occur, and successive reads only need to read other tracks on the same cylinder, or move a track at a time to get to the next set of data. The OS keeps a pointer into the file, which is reset to the next point in the file after each read, so explicit seeks are not needed.

One big difference between XP and earlier versions is that the defragmentation is automatically done during idle intervals. It uses heuristic analysis of the past eight times you started your PC to rearrange file layout dynamically into consecutive sectors. When the machine is idle for 10 minutes or you run `defrag c: -b`, XP will use that time to optimise the most used files. It will start optimising after your first boot, so your second boot will be faster.

Microsoft estimates that 90 per cent of optimisation is already done immediately after the first boot or run in XP and fine-tuned from there.

Protection

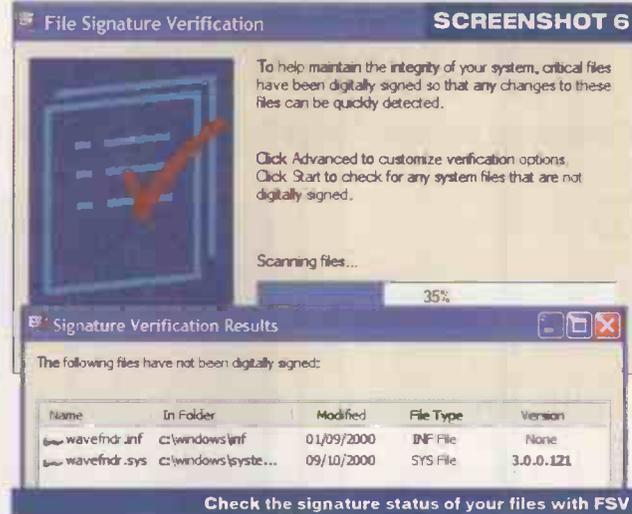
Good-quality device drivers are the key to a stable OS, but ensuring that users only employ good drivers has been a thorn in Microsoft's side for many years. People traditionally complained about the flakiness of Windows when the finger of blame ought to have been pointed at dodgy device drivers. Windows XP has several new technologies designed to protect it from unruly drivers.

In an attempt to improve the quality of driver software, ever since Windows 2000, Microsoft has imposed a stringent quality test on device drivers. Only those that pass rigorous testing earn a digital signature. A driver's digital signature also shows it has not been altered since testing. And if you install a driver that has been so approved, XP will be happy – but if you try and install an 'unsigned' driver then you'll be warned of this. In this way, Microsoft hopes to improve the robustness and reliability of its operating systems.

Driver testing is carried out at Microsoft's Windows Hardware Quality Lab. Third-party and Microsoft-supplied drivers go through the testing program to make sure that they meet the high standards. Once they pass testing, they are given a Microsoft digital signature. This signature is tied to the driver package that was tested (driver upgrades must be re-tested), and XP and 2000 will automatically recognise these digital signatures.

Driver signing, at this point, is merely informational: you can still install whatever drivers you can get, for better or worse. In some cases, Windows NT drivers, or even Windows 98 drivers, may work fine. When you try to install an unsigned driver, a warning dialogue pops up and you can still click on 'Install Anyway'.

This may be acceptable behaviour for an individual but not for a large network. Here, the driver signing system can be set to three levels of protection. Ignore allows any driver to be installed, regardless of its status, Warn is



the default setting, notifying the user if a driver does not have the Microsoft digital signature, and prompts for continuing or terminating the installation, and Block stops any drivers not bearing a digital signature.

It's possible to impose these settings on a standalone PC if you're an Administrator – simply double-click the System applet in the Control Panel. On the Hardware tab, click the 'Driver Signing...' button, choose the level and click OK. You can also make this choice the default for all users of the system.

Tucked away in the Windows folder is the File Signature Verification utility (see screenshot 6). This will report on installed drivers (actually all system files), giving the driver's filename and location, modification date, version, signature status and catalogue file. It will write this report to a text file, which can quickly be scanned for unsigned drivers. The utility can be run by clicking Start, Run, and then typing: Sigverif and clicking OK.

Regardless of this, there are some drivers that XP will refuse to install point-blank. Its Driver Protection database contains a list of drivers that are known to crash systems. When in user mode, the PnP Manager service blocks the installation of any driver listed in the database at \Windows\Drvmain.sdb and opens a web page at the Microsoft site that reports the reason the installation was blocked and where to find updates.

In the event that a duff driver is installed, all is not lost as XP makes it easy to put things back the way they were. The Hardware Installation Wizard (HIW) keeps backup copies of replaced drivers. When you update a driver, the HIW creates a 'system restore point' if the driver is unsigned and then saves the driver being replaced and its driver installation file (.inf) in a unique directory.

If you update the same driver again, the HIW will create a new backup and delete the previous one, thus keeping only the most recent backup. A driver's property page in the Device Manager has a button that lets you roll back the driver to the previous version.

If things are so bad that the new device driver prevents your PC from booting, you need to resort to the 'Last Known Good' recovery option, which you access through the boot menu. This allows you to revert the system to the last copy of the HKEY_LOCAL_MACHINE\System\CurrentControlSet subkey with which the system successfully booted and a user logged on.

This has been integrated with the HIW to make recovery more likely. Under XP, when you update a driver the HIW saves the previous version used to boot successfully in \Windows\Last Known Good\System32\Drivers, and when you select the Last Known Good boot option the updated driver is replaced with the old version.

Fat 32 or NTFS?

You must use Fat 16/32 filing system to:

- Dual boot with an OS other than XP, 2000 or NT (NT can only read Fat 16 volumes)
- Access the volumes from a bootable floppy (Third-party solutions are available)
- Format a floppy disk
- Decide about the file system to use - conversion from Fat to NTFS is a one-way trip

You must use the NTFS filing to:

- Encrypt files so only certain users have access
- Use fault-tolerant disk configurations such as Raid 5 or mirroring
- Assign permissions to files, specifying which users or groups have access
- Store files larger than 4GB
- Format partitions larger than 32GB
- Audit files for access by certain users or groups
- Stop files being accessed by bootable floppy disk
- Have a more robust filing system less prone to errors or corruption

Extending the XPerience

With Microsoft already working on the upgrade of XP, the way we interface with our PCs is set to change

Windows XP is not the end of the line for Windows – Microsoft is currently well down the path to the next upgrade of its number one operating system.

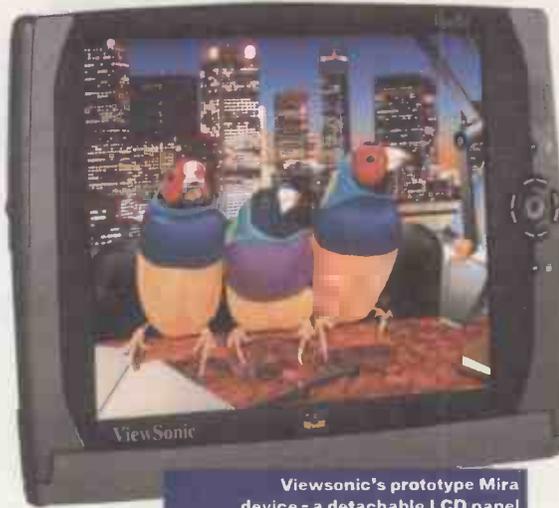
However, as far as Windows XP is concerned, its immediate future focuses on the release of Service Pack 1. Although Service Packs were made conceptually redundant by Windows XP's Automatic Updates, Microsoft has announced that there will be a Service Pack released, probably around September/October.

XP SP1 will roll up critical updates and contain enabling technologies for 'Mira' and new types of PCs such as the Tablet PC and the Freestyle-enabled PC. It will also include the changes required by the consent decree with the US Department of Justice.

Mira technology is designed to extend the Windows experience to a new generation of smart displays for use anywhere in the home. A Mira device will essentially be a large Pocket PC, capable of being carried around the house, allowing you to access your PC from anywhere.

Already Viewsonic has demonstrated a prototype Mira device – it looks like a typical LCD panel but it's detachable and can be picked up and carried around; the user interacts with the PC back in the home using wireless networking, Terminal Services technology and a stylus. It's perfect for web browsing, and other tasks that don't require heavy keyboard use. It's a lesser beast compared to the Tablet PC, which is a full-blown Windows PC, rather than an inflated PDA.

A complementary technology to Mira will be Freestyle. Users can connect a Freestyle-enabled PC to a TV set and hi-fi and use a remote control to view home videos, listen to music and flick through digital photos, watch DVDs and program Digital Video Recorder (DVR) capabilities through an onscreen program



Viewsonic's prototype Mira device - a detachable LCD panel

guide on the PC. The DVR also allows you to watch, pause, and record live TV like you would with, say, a Tivo. For Freestyle to work, however, a new generation of 'stereo component-like' PCs will need to be created.

Windows XP SP1 probably won't include Corona, the next generation of Windows Media Technologies. It'll include upgrades to all of Microsoft's digital media products, including Windows Media Server (which will ship with Windows .Net Server in late 2002), a new Windows Media Player, which will be available for all platforms, not just Windows XP.

Corona will feature new Windows Media Audio (WMA) and Video (WMV) formats. A new format, WMA Pro, will offer 24bit resolution and six channels (or more) of discrete sound for surround-sound capabilities.

With any luck, at about the same time as Windows XP SP1 is released, we'll also see the server version of Windows XP, Windows .Net Server 2002. Essentially a point upgrade of Windows 2000 Server, it'll comprise Standard Server, Enterprise Server, Datacenter Server versions as well as a new Web Server edition.

Windows .Net Server has been updated to include support for the .Net Framework and XML

Web Services. Windows .Net Server has also been tweaked for better performance and reliability: Microsoft says that it performs up to 50 per cent faster than equivalent Windows 2000 Server products.

Towards the end of 2003 we'll see the first updated release of Windows XP, code-named Longhorn. This won't represent a significant overhaul, but it will probably amount to a Windows XP Second Edition.

It's expected to offer a few .Net features, which means you will be able to use the Internet more efficiently and treat it as a continuation of your PC. Longhorn will also offer a slightly modified GUI, refining the task-based paradigm in Windows XP and adding support for more local services and web services in the shell-mounted task lists.

More importantly, reports indicate that it'll feature an SQL Server .Net-based file system, something originally meant for Longhorn's successor, Blackcomb. Dubbed Storage+, this file system will let Microsoft's search tools work across a wider range of storage devices, including the file system, Active Directory, SQL Server databases and Exchange Server data stores. Such a unified storage system will allow data

to be combined in a common database and accessed from a variety of devices, regardless of its format. Other Longhorn goodies include DVD burning and Windows Movie Maker 2, which will be a significant improvement over the existing version.

It has also been reported that Windows Update will be the first step in Microsoft's transition to a subscription model, allowing you to purchase Microsoft software and online services. In 2005 or so, we'll see the first major upgrade to Windows XP – Blackcomb.

Originally slated to be its first fully fledged .Net Windows release, Microsoft has now retreated from this goal, which is just as well because the widespread take-up of broadband, upon which .Net is predicated, hasn't happened yet.

Unsurprisingly, with such a distant release date, nothing concrete is known about Blackcomb, but it probably represents the last release of Windows in a recognisable form – thereafter Windows will embrace Microsoft's much vaunted .Net technology.

Announced back in 2000, Microsoft .Net consists of an Internet-based programming infrastructure as well as a user environment and services that support multiple devices, all built around the new extensible markup language (XML).

It includes server and client software, as well as services built around familiar faces, such as Windows, Office and MSN and that will be linked by the Internet. Neither a new operating system nor a new software suite, Microsoft .Net will rely on XML and a series of building blocks that Microsoft will host and sell as subscription services.

.Net will seamlessly blend the Internet with your PC, if we are to believe Microsoft. By then, we'll no longer buy Microsoft software, we'll rent it.

3 Amazing Offers

from Time Professional Systems



COMPUTER SHOPPER
Feb 2002



PC PLUS
Jan 2002



WEB USER
Dec 2001



WHAT COMPUTER
Dec 2001



WHAT PC?
Dec 2001



PC LIVE!
Nov 2001



WHAT PC?
Nov 2001



COMPUTER BUYER
Nov 2001

1

The Ultimate Powerflex XP2000+

SYSTEM for just **£595** + VAT

- XP 2000+
- 256MB DDR
- 80GB HARD DRIVE
- GeForce 4
- 24x CD-RW
- DVD DRIVE

+ More (see overleaf)



2

The Most Powerful Traveller 15.1"

NOTEBOOK for just **£999** + VAT

- 15.1" TFT
- A4 1600
- 384MB MEMORY
- 40GB HARD DRIVE
- CD-RW
- DVD DRIVE

+ More (see overleaf)



3

The Best Prices on Tailor Made Systems

for Business and Professional Buyers
Call us and we'll make a PC system tailored to your specification and price!



Lines open Mon-Fri 9am to 7pm. Sat 9am to 5pm. Sundays 10am to 4pm

Call sales now on

0870 8303 127

www.timecomputers.com



Professional Systems

Time PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

PRO(07)FR

The Ultimate PowerFlex XP2000+ £595 + VAT £699¹³ inc VAT

Take a closer look at the amazing specification of this limited special offer PowerFlex XP2000+ system.

Stock on this special offer is limited. Order early to avoid disappointment.

Time PowerFlex XP2000+



AMD ATHLON
XP2000+
PROCESSOR

PC2100
256MB
DDR RAM

SUPERFAST
80GB
HARD DISK

nVIDIA 64MB
GEFORCE 4
GRAPHICS

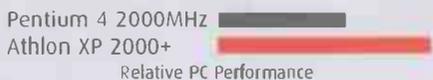
24x
CD-RW
DRIVE

16x
DVD ROM
DRIVE

BUILT-IN
ETHERNET
ADSL READY

INTERNET
MULTIMEDIA
KEYBOARD

- AMD Athlon XP 2000+ processor
- Seagate 80GB Hard Disk
- 256MB DDR PC2100 RAM memory
- 24 X CD-Rw CD-Rewriter/ CD Copier 'Burn-Proof' Drive
- 16 x DVD-ROM Drive
- nVidia GeForce 4 64MB "DDR" latest graphics card system with simultaneous "dual" screen (TV and Monitor) support
- Multimedia Power Keyboard system with "Hot keys"
- Hayes 56K V92 Modem and supanet Internet Access
- TV-out system with all necessary cables (s-video and composite)
- Logitech wheel mouse and 1.44MB floppy drive
- Built-in 10/100 Ethernet for ADSL router and networking
- Advanced AC97 stereo sound system
- Future-proof 7 bay ATX tower case with 250W power supply and extra cooling
- 4 x USB ports, Midi, Joystick, Serial, Parallel, Microphone, Modem and Audio ports. Microsoft Windows XP code 10104



PowerFlex Pro Model

512MB DDR PC 2100 RAM, Barracuda 7200 rpm Seagate hard disk upgrade, 2 x 1394 Firewire Ports, DDR 333 chipset, faster 32x CD-Rw, Premium 6 channel high performance sound system and Cyberlink Video/Audio Suite only **£99** +VAT = £116.33 extra.
code 10105

UPGRADE TO A PACKAGE - PAY NOTHING FOR 6 MONTHS

- See Finance Example Below

PowerFlex PACK 1

- 17" CRT monitor system
- Epson C40 1440 dpi printer
- Stereo speaker system
- Gamepad & Joystick
- Sun Star Office GT Suite (14 software packs)
- Pay Nothing For 6 Months - see example below.

£199 +VAT = £233.83 extra.
code: 0999-030-00467

PowerFlex PACK 2

- 17" FLAT CRT System with maximum 1600 x 1200 resolution
- Epson C60 2440 dpi printer
- 5.1 surround sound speaker system with subwoofer and 5 satellites
- Digital Camera - 3 in 1 digital camera
- Gamepad, Joystick and 6 Top Games
- Sun Star Office GT Suite (14 software packs)

£299 +VAT = 351.33 extra.
code: 0999-030-00468

PCPlus
BEST VALUE

PC PLUS
Nov 2001

RECOMMENDED
PC ADVISOR
RECOMMENDED

PC ADVISOR
May 2001

WHAT PC?

WHAT PC?
May 2001

PC HOME
BEST BUY

PC HOME
April 2001

BEST BUY
PC ADVISOR
BEST BUY

PC ADVISOR
Feb 2001

COMPUTER SHOPPER
BEST BUDGET BUY

COMPUTER SHOPPER
Feb 2001

PRO(07)02

TIME

Professional Systems

Lines open Mon-Fri 9am to 7pm. Sat 9am to 5pm. Sundays 10am to 4pm

Call sales now on

0870 8303 127

www.timecomputers.com

Time PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

The most Powerful 15.1" CD-R Notebook

£999 + VAT **£1173.83** inc VAT

Time Traveller Professional

- 15.1" TFT XGA (1024 x 768) screen
- AMD Athlon 4-1600 genuine 'mobile' processor
- 384MB PC133 SDRAM Memory (expandable to 640MB)
- 40GB Hard Disk (Fujitsu or Toshiba)
- CD-Rw CD-Rewriter/CD-copier Drive
- DVD-ROM Drive (combo)
- PowerNow! system to enhance battery life
- 56K V90 modem and Supanet internet access
- Built-in 10/100 Ethernet (RJ45) for ADSL router and networking
- 32MB AGP x 4 graphics and 3D wavetable sound
- Built-in 3.5" floppy drive
- 5 x Easy start and 1 dedicated 'mail receive' buttons
- TV-out port for large screen presentations
- Li-ion Long life 8 cell battery and A/C adaptor/charger
- Built-in microphone and twin stereo speakers plus ports for external speakers, microphone and analogue/digital Line Out devices
- Parallel printer, external SVGA, Infra Red IRDA, external PS/2, Serial, 2x USB ports and 2 PC Slots- 2 type 2, 1 type 3 (with 32 bit card bus and zoomed video support)
- Advanced keyboard and 2 button track pad
- Power DVD video software and CD 'burn' software
- Microsoft Windows XP
- 3.4Kg 310 x 265 x 40mm

code 10106

XGA
15.1"
TFT SCREEN

ATHLON 4
1600
MOBILE

PC 133
384MB
SDRAM

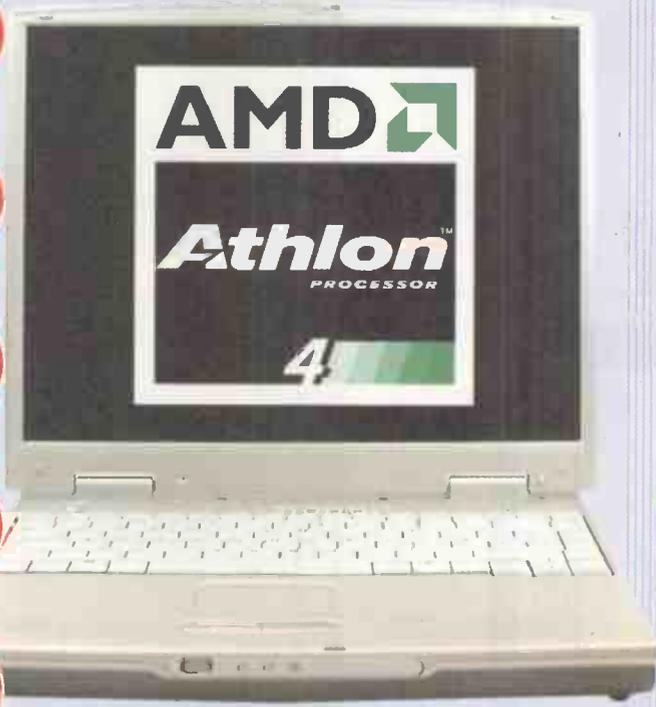
MOBILE
40GB
HARD DISK

CD-Rw
DRIVE

DVD ROM
DRIVE
(COMBO)

BUILT-IN
ETHERNET
ADSL READY

TV-OUT
DUAL SCREEN
SUPPORT



Pentium 4 2000MHz 
Athlon 4 1600 Mobile 
Relative PC Performance

UPGRADE
to the Traveller Professional Pack
PAY NOTHING FOR 6 MONTHS - See Finance Example Below

Traveller PROFESSIONAL PACK

- Epson C40 1440 dpi printer
- Full size multimedia keyboard
- Laplink and Cable
- Headset Microphone
- Dragon speech & dictation pack
- Sun Star Office GT Suite (14 software packs)



£99 + VAT = £116.33.
code: 0999-030-00466

14
Software
Packs

The Time Traveller Professional Notebook is the most powerful genuine 'mobile' processor based notebook you can buy for £999 +VAT.

Unlike some notebooks that use desktop Pentium 4 processors (not recommended by the processor manufacturer), this notebook uses a genuine mobile processor and incorporates PowerNow! technology to enhance battery life.

Special offer price limited to first 2000 notebooks. Offer limited to one notebook per customer. Please order early to reserve your notebook.



PERSONAL COMPUTER WORLD
Feb 2001



WHAT PC?
Feb 2001



WHAT PC
Jan 2001



PERSONAL COMPUTER WORLD
Feb 2001



COMPUTER BUYER
Jan 2001



PC PLUS
Jan 2001



PC LIVE
Dec 2000



WHAT PC?
Dec 2000

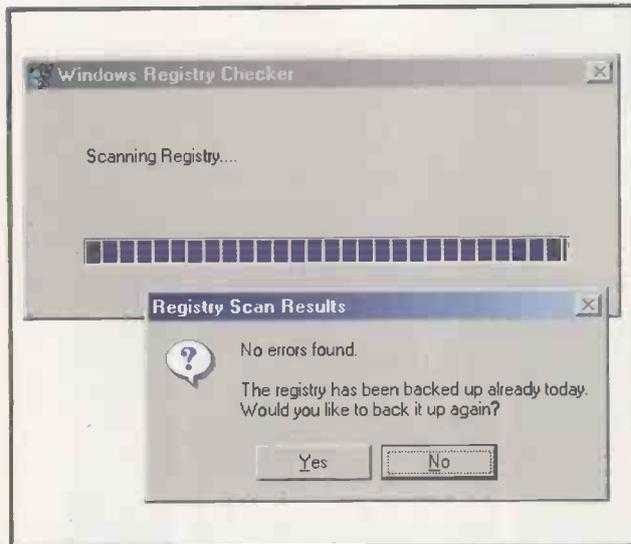
Time PCs use genuine Microsoft® Windows® www.Microsoft.com/piracy/howtotell

All prices shown are in UK £. Contact Dublin Store for Irish prices. Courier delivery £42.54 + VAT = £49.99. Finance available on models purchased with office pack only. Example for CASH PRICE of £1000, no deposit, pay nothing for 6 months, then either pay just the CASH PRICE of £1000 or alternatively pay 42 monthly payments of £40.92 making total amount payable £1718.64. APR 29.8%. Credit subject to status. Written quotations on request. Statutory cancellation rights apply to distance sales. Prices, specifications and offers are subject to change, availability and our conditions of sale, copies of which are available from Time Computers Ltd, Burnley, BB12 7TG. Fax 01282 77 07 01. www.timecomputers.com. Licensed credit brokers Select required PC printer cable at extra cost. Goods normally delivered within 14 days. All orders fulfilled within 28 days unless otherwise specified. Monitor appearance may vary and may be branded LG/Samtron. CRT viewing area can be approx 1" less. Some software is pre-loaded while the rest is supplied on CD with online help. Photography/software packs shown for illustration only. Time and the Hourglass are registered trademarks. More than just a PC and Time Machine are Trademarks of Time Computers Ltd. Time Professional systems are only available direct from Time. Not available in our retail stores. E&OE. Statutory cancellation rights apply to distance sales.

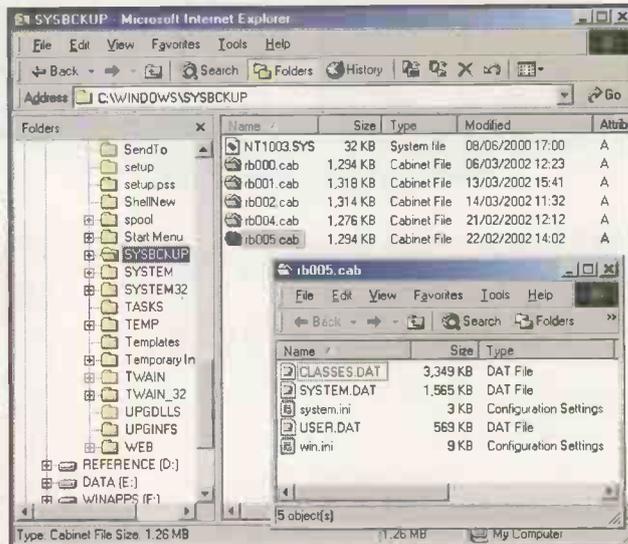
29.8%
APR
4 YRS

How to back up and restore the Registry

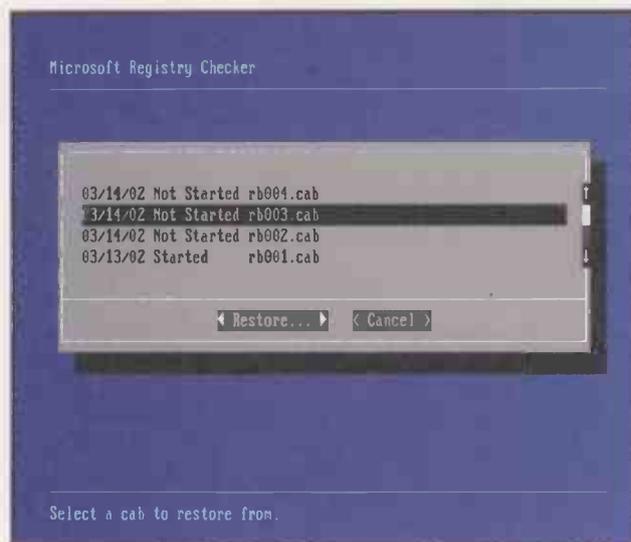
Don't get caught out - follow these four easy steps to ensure you can restore your system in an emergency



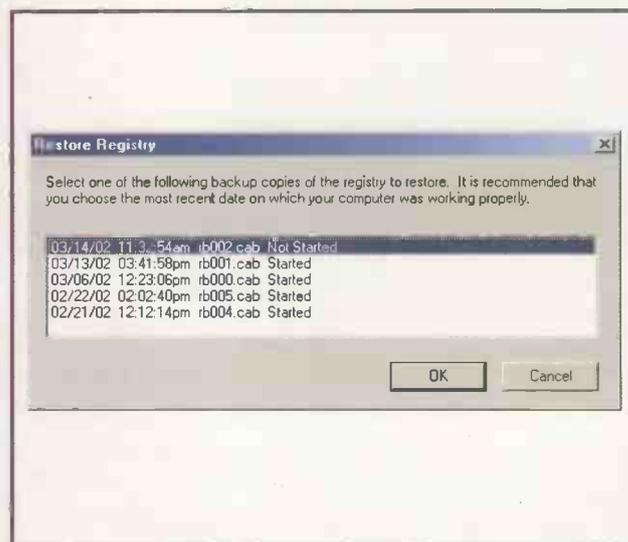
1 Windows ME and XP users have a System Restore feature that backs up not just the Registry, but also other essential system files. However, the Windows 98 method described here works equally well for ME users who don't want to make a complete system restore point. The Registry Checker is hidden in the Tools menu of the System Information utility, or you can click Start, Run, then type scanregw. This will check the Registry for errors, and ask if you want to make a backup. It's a good idea to do so before installing new software or using the Registry editor.



2 By default, Windows 98 and ME create Registry backups each day when the computer is restarted. Backups are stored in the Windows\Sysback folder. This is a hidden folder so you will need to turn on View hidden files from Explorer's Folder Options, View dialogue. Backups are stored as .cab files: open one and you will see it contains the User, System and, in Windows ME, classes.dat files plus win.ini and system.ini. Five generations are kept, but you can change this number by editing the MaxBackupCopies entry in the file Windows\Scanreg.ini.



3 When Windows starts, it automatically checks the Registry. If any errors are found, it will replace the Registry with the most recent backup. You can 'roll back' the Registry to an earlier version manually. In Windows 98, first you need to close down Windows. Restart the computer and hold down the Control key to display the boot menu, then choose 'Safe mode command prompt only'. At the command prompt type scanreg /restore - the Registry checker will run, then the screen above will appear and you can choose which backup to restore.



4 Windows ME users don't have the option to start in command prompt mode, but they can still do so by booting from a floppy startup disk. There is, however, an undocumented trick available. If you type scanreg/restore into the Start, Run, box, or a windowed MS-Dos box, then you'll get a warning that Windows needs to be restarted and that you should close all programs. Follow these instructions, OK the warning and you will see the dialogue above: choose the backup you want, click OK and your PC will restart with the chosen backup restored.

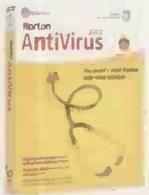
Revolt
Against corporate prices
Revolutionise

The way you buy software

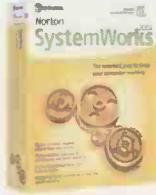
www.rebellio.com

We specialise in a limited range of highly discounted quality products

Special Introductory Offers!



UK P&P £2.50



Norton Anti Virus 2002

£25 inc vat

One of the leading Anti Virus programs for many years now.

Norton SystemWorks 2002

£32 inc vat

The smartest way to keep your computer working.

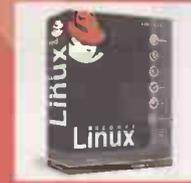
Order Securely Online at www.rebellio.com
Call for Details 0151 625 9790

NEW

The latest release of **Red Hat Linux** has arrived

Red Hat Linux 7.3 Professional
includes 9 CDs + DVD + SysAdmin CD

- New features include:**
- Kernel 2.4.18, tested by Red Hat
 - KDE 3.0
 - XFree86 v4.2
 - Updated Apache Secure Web Server
 - Postfix Mail Server
 - GNOME 1.4
 - Mr Project
 - Evolution
 - GNOME Meeting
 - Java support with IBM JDK 1.3.0
 - PostgreSQL
 - and many more



Red Hat Linux 7.3 Personal
includes 8 CDs + DVD

- New features include:**
- Kernel 2.4.18, tested by Red Hat
 - KDE 3.0
 - XFree86 v4.2
 - MP3 Player XMMS
 - DVD Player Xine
 - GNOME 1.4
 - GIMP
 - Evolution
 - GNOME Meeting
 - CD Writer XcdRoast
 - and many more

To find out more about Red Hat Linux 7.3 or to buy your copy, please visit us at

europe.redhat.com/shop/en



redhat.

Red Hat Linux 7.3 is also available from leading retailers, such as

Action

action.com

amazon.co.uk.

amazon.co.uk/software

PC WORLD

The Computer Superstore

make it easyspace for:

domain names

easy on your pocket
from £3.50
per year

ecommerce

easy action

webhosting

easy service
from £30.00
per year

keywords
easy to find
from £35.00
per year

www.easyspace.net

The UK's largest domain name registrar offers service, expertise and value for money - all backed with reliable, robust technology. Put our size and strength to work for you



easyspace

domain names - ecommerce - webhosting - keywords

No.1 Range. No.1 Solution.

Buy with confidence from the Best PC Manufacturer of 2001, as awarded by PCW

No.1 Value PC

PC2GO Ready to ship PC



Matrix XP 1800+ nFORCE

- AMD Athlon™ XP 1800+ with QuantiSpeed™ Technology
- 256MB High Performance DDR memory
- 40GB UDMA-100 Hard Drive
- 17" Digital (16" VIS) - Upgrade to 15" TFT £180 +VAT
- Integrated 64MB nVIDIA GeForce2 graphics
- 16x DVD-ROM
- Onboard 4 channel sound & Stereo amplified 80W (PMPO)
- MESH 3 Year On-site Warranty†
- Plus Standard Features (see MESH Advertising)

£599 £703.83 inc.VAT

Elite 1.2GHz CX

- Intel® Celeron™ 1.2GHz processor
- 256MB High performance SDRAM
- 40GB UDMA-100 Hard Drive
- 17" Digital (16" VIS) - Upgrade to 15" TFT £180 +VAT
- 64MB nVIDIA GeForce2 - MX440 with TV out
- 16x DVD-ROM
- Onboard SoundBlaster Compatible
- Stereo amplified 80W (PMPO) speakers
- MESH 3 Year On-site Warranty†
- Plus Standard Features (see MESH Advertising)

£599 £703.83 inc.VAT



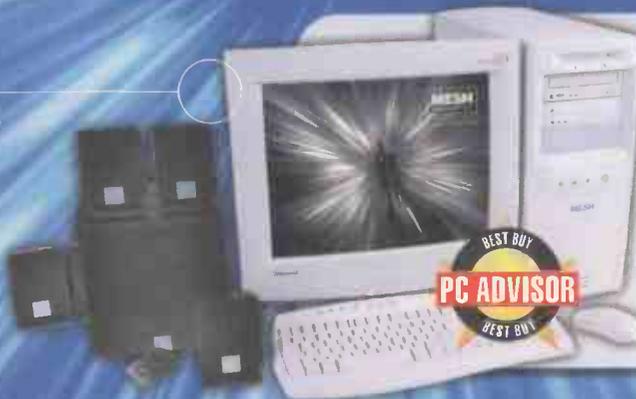
No.1 Budget Intel PC

Ideal for Home or Office

No.1 Power PC

PC2GO Ready to ship PC

Awarded Best Buy
PC Advisor - June 2002



Matrix XP 2000+ BPC

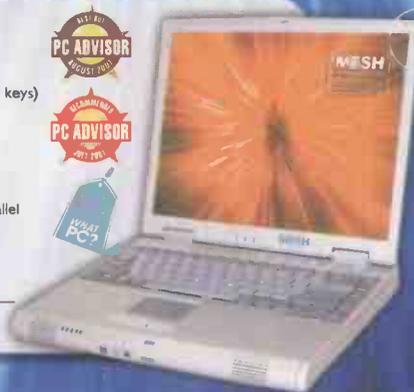
- AMD Athlon™ XP 2000+ QuantiSpeed™ Technology
- 256MB High performance DDR memory
- 80GB UDMA-133 (7200rpm) with 2MB buffer
- 19" Mitsubishi DPLUS 92.25mm (18" VIS)
- Upgrade to 15" NEC TFT for £50 £58.75 inc.VAT
- 64MB ATI Radeon 8500LE with TV out & DVI
- 16x DVD & CDRW (40x12x48) with buffer
- SoundBlaster Audigy with 1394 FireWire port
- Creative Labs Inspire 5300 - 5 Point Surrounds
- MESH 3 Year On-site Warranty†
- Plus Standard Features (see MESH Advertising)

£999 £1173.83 inc.VAT

Discovery 14.1" P4 2000

- Intel® Pentium® 4 - 2.0GHz with 512k cache
- 14.1" TFT XGA (1024x768) & Windows keypad (includes 5 hot keys)
- 256MB SDRAM & 20GB ATA-100 EIDE
- 16MB DDR ATI M6-M AGP Graphics
- 8x DVD-ROM & External 3.5" Floppy Drive
- 2x PCMCIA Type II slot, VGA for external monitor
- 2 x USB, IEEE 1394, Audio out (SPDIF), mic-In, TV out, IR, Parallel
- 3D stereo sound with internal speakers and mic
- 313mm(W) x 263mm(D) x 36mm(H) Weight 2.95kg
- Plus Standard features (see MESH Advertising)

£1099 £1291.33 inc.VAT



No.1 Notebook

Most powerful P4 notebook available

Based on multi-award winning Discovery 14.1
- PC Advisor & What PC?

For full specs, further information
and terms & conditions please refer
to our main advertising inside



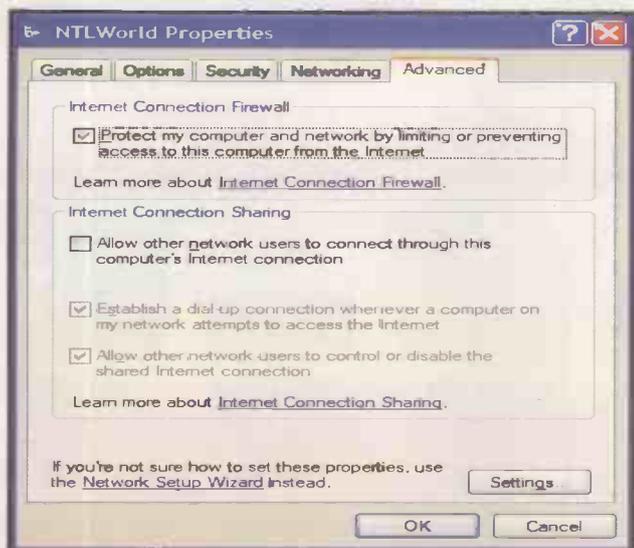
www.meshcomputers.com

More awards from the IT press
than anyone else over the past 3 years!

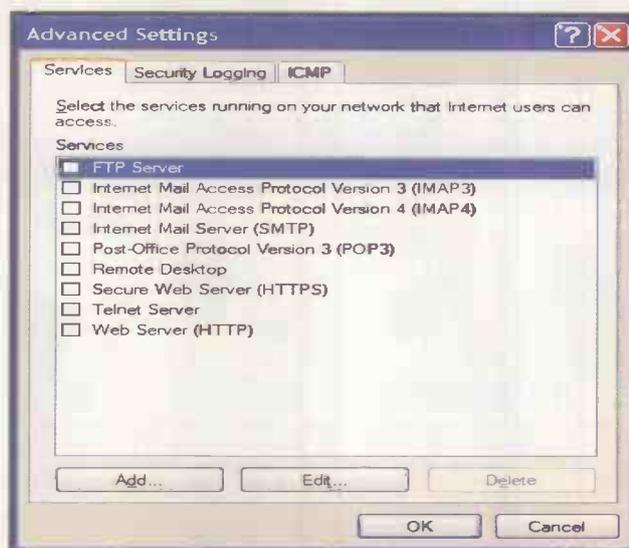
MESH
computers plc

Configuring the XP firewall

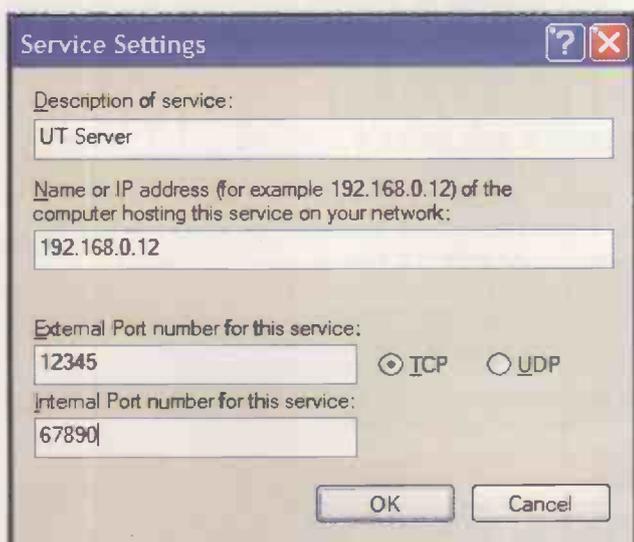
XP users can protect themselves from the bad guys with the Internet Connection Firewall - here's how



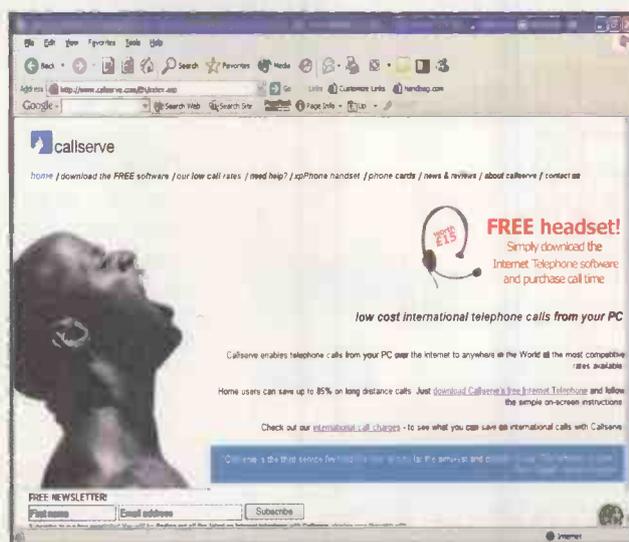
1 As we now spend more time online it is essential to use a firewall to protect us from the bad guys haunting the Internet. There are several good utilities available, including Zone Alarm, which is free for personal use, but Windows XP comes with a competent firewall as standard - the Internet Connection Firewall (ICF). Activation is simple: right-click on My Network Places and choose Properties. Right-click on the Internet connection icon and choose Properties again. Click on the Advanced tab and you'll see an ICF checkbox. Tick it to enable ICF.



2 ICF is a powerful packet firewall, but it doesn't have all the features of a full-blown firewall. ICF is either on or off; you can't selectively protect specific ports or protocols. However you do have the ability to allow a few protocols to pass, such as HTTP, FTP, and L2TP. Naturally, Microsoft utilities such as Windows Messenger, Remote Assistance and games and applications that use Direct Play, will be able to work through ICF seamlessly. A number of predefined services are set up as standard and you simply tick the checkbox to activate them.



3 You can also define additional ports for services. In the Advanced Settings dialogue click on Add and give the service a name. You'll need the name or IP address of the internal computer hosting the server - this will most likely be an internal IP address. Enter the external and internal port numbers for this service. The external port number will be the one Internet users will connect to. The internal port number will be the actual port number on the computer hosting the service listed above. You also need to specify whether they are TCP or UDP ports.



4 Certain apps, however, such as Callserve's Internet Phone, remain problematic with ICF. Callserve advises users to open UDP ports 1717, 1718 and 1719, TCP port 1720 and all TCP and all UDP ports between 16384 and 32767, ie some 16,000-plus ports. Doing this manually, one port at a time with ICF, isn't feasible. In this case you can either temporarily disable ICF or use Zone Alarm instead - this firewall can automatically open all the ports needed when the app is first run. But remember - the more ports open, the less secure you are.

MAXX PC POWER & SPEED FROM ONLY £699

- 60 GB HARD DRIVE
- 256 MB RAM
- CD RE-WRITER
- DVD DRIVE



0%
FINANCE



ALLIED ASSAULT 31.99 C'SHIP MGR 01/02 17.99 DUNGEON SIEGE 28.99 JEDI OUTCAST 27.99 SOLDIER 2 27.99 SIMS ON HOLIDAY 18.99
GTA 3 24.99 LORD RINGS 34.99 FIFA WORLD 29.99

BEST SELLING PC GAMES

2002 FIFA WORLD CUP	29.99
CHAMPIONSHIP MANAGER 01/02	17.99
COMMAND & CONQUER: RENEGADE	27.99
COSSACKS:	
- EUROPEAN WARS	27.99
- EXPANSION PACK: ART OF WAR	18.99
DELTA FORCE 2 & ROGUE SPEAR DOUBLE PACK	12.99
DUNGEON SIEGE	28.99
EMPIRE EARTH	28.99
FELLOWSHIP OF THE RING (UNIVERSAL)	34.99
GEOFF CRAMMOND'S GRAND PRIX 4	28.99
GLOBAL OPS	27.99
GRAND THEFT AUTO 3 (18)	24.99
HALF-LIFE GENERATION 3	16.99
HOOLIGANS: STORM OVER EUROPE (18)	23.99

TOP PC SOFTWARE

MEDAL OF HONOR: ALLIED ASSAULT	31.99
MEDIEVIL TOTAL WAR	27.99
NEVERWINTER NIGHTS	32.99
RETURN TO CASTLE WOLFENSTEIN (15)	24.99
SOLDIER OF FORTUNE 2: DOUBLE HELIX (18)	27.99
STAR TREK:	
- BRIDGE COMMANDER	26.99
- VOYAGER & ELITE FORCE DOUBLE PACK	16.99
STAR WARS: JEDI KNIGHT II: JEDI OUTCAST	27.99
SYSTEM SHOCK 2	9.99
THE LORD OF THE RINGS: FELLOWSHIP OF THE RING (EA)	34.99
THE SIMS DATA CD: ON HOLIDAY	18.99
THE SIMS PARTY PACK	36.99
UNREAL TOURNAMENT 2003	27.99
WARHAMMER CHAOS GATE & FINAL LIBERATION: SPECIAL DOUBLE PACK	9.99

DANCE EJAY 4	25.99
DARK BASIC 3D GAMES DESIGNER	33.99
EASY CD CREATOR 5 PLATINUM + 10 CD-Rs	39.99
ELECTRIC GUITAR COACH	26.99
EJAY DJ MIX STATION	17.99
INTERNET CLEANUP 2	18.99
LOTUS SMART SUITE MILLENNIUM EDITION	8.99
NERO BURNING ROM 5.5	40.99
NORTON ANTI VIRUS 2002 & NORTON UTILITIES 2002 BUNDLE PACK	48.99
NORTON INTERNET SECURITY 2002 & NORTON ANTI VIRUS 2002	46.99
NORTON PERSONAL FIREWALL 2002	32.99
WINDOWS XP PLUS	36.99
WINDOWS XP	FROM .87.99

<p>256 MB RAM £69.99</p> <p>SAVE £15</p> <p>128 MB RAM NOW ONLY £39.99</p> <p>INC VAT</p>	<p>128 MB 99.99 INC VAT</p> <p>SAVE £40</p> <p>KEY-RING SIZED 64MB PORTABLE HARD DRIVE £59.99</p> <p>INC VAT</p>	<p>SAVE £10</p> <p>DIGITAL DREAM L'ESPION DIGITAL CAMERA £39.99</p> <p>INC VAT</p>	<p>SAVE £25</p> <p>HEWLETT PACKARD APOLLO PRINTER £44.99</p> <p>INC VAT</p>	<p>FREE</p> <p>VALUE BUNDLE: Nero 5 Burning Rom 1 CD-RW & 1 CD-R with the BENQ CD-RW</p> <p>SAVE £10</p> <p>BENQ SEAMLESS-LINK CD RE-WRITER £89.99</p> <p>INC VAT</p>	<p>SAVE £15</p> <p>AWESOME GeForce 4 GRAPHICS CARDS FROM £89.99</p> <p>INC VAT</p>	<p>FREE CARRY CASE & MINI MOUSE!</p> <p>0% FINANCE</p> <p>SAVE £100</p> <p>IRIDIUM STARBOOK NOTEBOOK FROM ONLY £799.99</p> <p>INC VAT</p>
--	---	---	--	--	---	--

GREAT WEB SITES

WIN OVER £14 MILLION IN PRIZES!
CARS, CASH + MORE!
WINACAR.co.uk

THIS IS BOB...

FREE ENTRY!

HE DOESN'T BUY GAMES, HE WINS THEM!
Win any GAME or DVD of your choice, every day!
GAMEADAY.co.uk

WOULD YOU CHEAT ON LARA?
OVER 20,000 CHEATS FOR ALL FORMATS!
UKCHEATS.com

Special Reserve

Discount Network
Specialreserve.net

MAIL ORDER SALES - PHONE US ON:
0870 725 9999

SHOP WITH US VIA THE INTERNET AT:
UKGAMES.com

BIG CLUB SHOPS!

gamer of the year 2002

WIN! WIN! WIN!

- £1,500 Pentium 4 PC
- 77 Games of your choice!
- £700 in Gift Vouchers!
- 77 "Gamer of the Month" Trophies
- "Gamer of the Year 2002" Trophy

JUST TURN UP AT ANY SPECIAL RESERVE SHOP TO ENTER!
FOR MORE INFORMATION VISIT: GAMEROFTHEYEAR.CO.UK

FREE HOSTING!

UNLIMITED FREE EMAIL & WEB SPACE & YOUR OWN DOMAIN NAME FROM ONLY £9.99*

.co.uk .org.uk from £9.99** (2 Years)
.com .net .biz .info from £19.99** (2 Years)
.me.uk DOWN IN PRICE £41.99** (2 Years)

Every domain registered at GetDotted comes with Freola's unlimited hosting package including FREE unlimited web space, FREE Customer Support, FREE Unlimited email & email forwarding and FREE Web Site promotion - ABSOLUTELY FREE! If you are fed up paying for expensive hosting fees, move your site over to us to maximise your web services for FREE. Do it NOW before your renewal is due.

Visit **GetDotted.com** & **Freola.com** for the best web packages around - Don't delay order today!

*PRICES DO NOT INCLUDE VAT

OR VISIT ONE OF OUR AMAZING
7 BIG CLUB SHOPS

OPEN UNTIL LATE

BASILDON
Festival Leisure Park, Basildon, Essex
☎ 01268 28 77 76

BRISTOL
351 Gloucester Road (A38), Bristol
☎ 0117 924 5000

CHELMSFORD
43 Broomfield Road, Chelmsford
☎ 01245 348 777

EGHAM
M25 J13, 168 High Street, Egham, Surrey
☎ 01784 473 444

NOTTINGHAM
M1 J25, 164 Derby Road, Stapleford, Nottingham
☎ 0115 949 1000

SAWBRIDGEWORTH
The Mallings, Station Road, Sawbridgeworth, Herts
☎ 01279 322 399

UPMINSTER
Just 6mins from M25 J29, 209/213 St Mary's Lane, Uppminster, Essex
☎ 01708 22 55 44

INCREDIBLE FREE GIFTS FROM Special Reserve

JOIN SPECIAL RESERVE FOR A YEAR FOR £7.50 (UK) OR TAKE A TRIAL MEMBERSHIP (JUST £1)

<p>FREE GRAND THEFT AUTO 2 FOR PC</p>	<p>FREE TOP TEN GAMES PACK FOR PC</p>	<p>FREE STUNT GP & SEGA RALLY FOR PC</p>	<p>FREE LOGIC 3 HURRICANE ANALOGUE JOYSTICK FOR PC</p>	<p>FREE ROBOCOP: DARK JUSTICE DVD MOVIE</p>
---------------------------------------	---------------------------------------	--	--	---

CHOOSE ONE OF OVER 40 INCREDIBLE FREE GIFTS WHEN YOU JOIN SPECIAL RESERVE FOR ONE YEAR! THERE IS NO OBLIGATION TO BUY ANYTHING. MEMBERS RECEIVE REGULAR ISSUES OF THE CLUB MAGAZINE, PLUS REDDY VOUCHERS WITH EVERY PURCHASE OVER £5 - COLLECT 5 REDDIES AND CHOOSE ANOTHER FREE GIFT! SEE THE FULL LIST OF GIFTS AT UKGAMES.COM, OR ORDER BY PHONE: 0870 725 9999, OR VISIT ANY SPECIAL RESERVE DISCOUNT STORE.

Prices include VAT and postage & packing to UK mainland addresses. Trial Membership is £1 including one magazine. All offers are subject to availability. Prices & specifications may change. We sell to everyone but the prices listed are for Special Reserve Members & are internet prices. Save = Save off manufacturer's RRP. E&OE - Errors and Omissions Excluded. Special Reserve members can win the Game or DVD of their choice. Non-members who contribute can still win Gameaday, they will win a 1 year Special Reserve membership plus their choice of Free Gift. *Satisfaction Guarantee and 0% Finance subject to status, total purchase must be over £250, see club mag for details. Sent to press 10/05/2002



HANDS ON

CONTENTS

158 Question Time

Your questions answered by our experts

165 Workshop

In the second section of our two-part workshop, Gordon Laing produces a professional quality DVD

168 Windows

Queries answered on Outlook and recently opened documents, plus creating desktop icons

174 Windows 2000

The problems of converting from Fat 32 to NTFS

176 Windows XP

How to speed up Windows XP boot times, protect your password and boot from a floppy

178 Linux/Unix

Unix on Intel, and configuring Internet keyboards

184 Hardware

Gordon Laing sorts out Bios and dual-boot troubles as well as a persistent crashing problem



188 Word Processing

Manipulating numbers in Word tables

189 Spreadsheets

Some tips on renaming documents

190 Databases

Mark Whitehorn looks at the Microsoft Database Engine (MDSE) and gives tips on cleaning data

192 Sound

Niall Magennis immerses himself in the world of surround sound speakers

194 Graphics & DTP

How to use Imageready's new features to create rollover graphics for the web

196 3D Graphics

What future Blender? And Benjamin Woolley investigates Maya Personal Learning Edition

199 Visual Programming

Tim Anderson keeps up to date with current exchange rates by creating a web service with Jbuilder and Visual Studio.Net

214 Web Development

Exploring the options that VB.Net offers for creating DataGrids on the web

217 Ecommerce

Nigel Whitfield takes stock of the fast-moving world of ecommerce

219 Networks

Roger Gann continues his look at TCP/IP with explanations of IP addresses and subnetting

The Hands On section of *PCW* is where you can find out more than just what's behind the news and reviews. Our team of experts is made up of people using technology in the front line, whether it's trying to persuade one program to save data in the format of another, or migrating a business and its tools to the online economy.

From graphics tips to visual programming, and disk drives to spreadsheets, you'll find tips and info here from the sharp end of computing. The Hands On team, though, isn't just the writers and editors who put this part of the magazine together – the readers are just as much a part of it.

It's your tips and queries, whether in Question Time or in the form of feedback and questions to the writers, that keep Hands On up to date and relevant. So, while we can't guarantee to respond personally to every question, we do read all the comments that are sent in. Whether it's a knotty problem, or a nifty solution you've found, drop us a line – it's good to share.

Nigel Whitfield, Hands On Editor

COLUMNISTS



Tim Anderson is both an IT journalist and software developer, and began writing for *PCW* in 1993. Since his first computer in 1980, a Commodore PET, he has acquired expertise in RAD programming, Windows and the Internet.



Roger Gann got involved with PCs late in the last century after dabbling in law and the construction industry. He edited the UK's first Windows magazine. These days he potters about in his office, among his collection of antique computers.



Terence Green has tussled with computers ever since starting as an IBM mainframe operator in 1979. Since 1981 he has documented the gap between what PCs claim to do and reality.



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80. Today he benchmarks PC components to within an inch of their lives, but as a 10-year contributor and former editor of *PCW*, he ought to know better.



Niall Magennis has been dabbling in MIDI and digital audio since the days of the Atari ST. He writes on a freelance basis for a number of music magazines and lives in London in a flat overrun with music equipment.



Ken McMahon became a freelance journalist after he experimented with graphics on a Commodore 64. In 1987 he bought an Apple Mac Plus before founding Pelican Graphics, and has not looked back since.



Tim Nott is a full-time freelance journalist. When not writing about Windows and word processing, he tackles subjects as diverse as the Internet economy and France, where he currently lives with his wife and family.



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera.



Stephen Wells is a freelance journalist and has been a regular contributor to computer magazines since 1985. He has been writing *PCW*'s Spreadsheets column for seven years. A US citizen, he now resides on the Essex coast.



Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars. He's also extremely fond of penguins.



Nigel Whitfield edited computer magazines before going freelance in 1995. A specialist in Internet and consumer issues, he has a degree in Computing Science from Imperial College. He lives in Hackney with his three cats.



Benjamin Woolley is a writer and broadcaster who first started experimenting with 3D graphics when he worked at the BBC. It was during this time that he developed some of the earliest CG work to appear on TV.



Advice from our experts

Our Hands On experts answer your questions and solve your problems

Databases

Q I want to build an Access project file, but when I do I get a message asking which database I want to use. I don't have SQL Server, but I seem to need something called the SQL Server desktop engine. I gather this is free. Do I have to download it?

Harry Heighton

A The Microsoft SQL Server 2000 Desktop Engine (MSDE 2000) doesn't install by default as part of Office XP. Nevertheless it is there on the Office XP CD-Rom – you just need to install it manually.

The steps are as follows:

1. De-install the MSDE if it is already present on your system.
2. From the Windows Explorer, open the \MSDE2000 folder on the Office XP CD-Rom.
3. Read the Readme.txt file.
4. Double-click setup.exe which lurks in that folder and let it run its course.
5. Reboot.

In the help system it then says:

'Microsoft strongly recommends you change your password if you use the System Administrator (SA) password to log on, especially on a Windows 98 operating system.' See also this month's Database column and screenshot 1.

Hardware

Q My 8GB hard disk is partitioned into drives C, D, E, F and G.

I have bought a new hard disk and created three partitions on it, but would like them mapped to drives H, I and J. Every time I try to do this, my three new hard disk partitions become drives D, I and J. My old C partition is still C, but the D, E, F and G partitions have been forced forward to become E, F, G and H!

Michael Cooke

A There are three different types of partitions, called Primary, Extended and Logical. You can only have one Primary partition on each hard disk, and Windows always gives priority to them. You have created a Primary partition on both hard disks, so Windows will map them as drives C and D, before going back to the first disk and mapping the other partitions. The solution is to



External USB CD rewriters, such as this one from Lacie, are useful for notebook users who want to back up data

delete the partitions on your second disk and start again, but this time, use Extended and Logical partitions instead.

You must create one big Extended partition using all the available space on the second hard disk, then split this up into the three Logical partitions you desire. Windows will then map your partitions in the desired order, starting with the Primary and Extended/Logical partitions on your first disk, followed by the Extended/Logical partitions on your second disk.

Remember that if you want your partitions to be bigger than 2GB, you must say Yes to enable large disk support when you start Fdisk.

work on the BP6's PPGA sockets, and second because dual-processing is not currently supported by the C3. Via says its forthcoming Nehemiah processor, due to be launched later this year, supports dual configurations, but we don't expect it to work in old PPGA boards such as the BP6.

Q I would like to buy a notebook and be able to back up its data onto CD-RW, but cannot afford a model with a built-in CD-RW drive. Are there any external CD-RW drives with USB interfaces I could use instead?

Andy Healey

Q Can I use ADSL services with my notebook? Is there an internal solution I can use?

Stewart Roberts

A Yes and no. External ADSL modems are available with either USB or Ethernet connections and modern notebooks will definitely have one or both of those ports. We couldn't find a PC Card ADSL modem which would slip inside your notebook though.

Q Will a pair of Via 933MHz C3 processors work on Abit's BP6 motherboard?

Peet McKimmie

A Sadly not, for two reasons: first the C3 is an FC-PGA (Flip-Chip Pin Grid Array) processor which won't

A Lacie (www.lacie.co.uk) offers a range of external CD rewriters featuring USB 1.1/USB2 and Firewire ports (if you buy a Sony notebook, you should be able to use the Firewire connection). Lacie's desktop external CD-RW U&I drives start at £150 ex VAT, while its portable Pocket CD-RW drives (pictured above) cost from £210 ex VAT.

lomega (www.lomega.co.uk) also produces external CD-RW drives with USB 1.1 and USB2 support, costing from £120 ex VAT. Note, though, that the lower speed of USB 1.1 means that CD writing is limited to four-speed. Consequently if you're only ever going to plug it into a USB 1.1 interface, you won't see the benefit of the faster and more expensive CD-RW models.

Graphics and DTP

Q How can I convert a square bitmap image to a circular one? I want to take a square image and convert it to a circle by distorting the entire image, not by cropping it. I have access to Corel Photopaint 9, Coreldraw 9, Adobe Photoshop 5.5 and Paint Shop Pro 5.01.

Martin Dasherper

A Use Photoshop's spherize filter (filter/distort/spherize). Spherize also lets you constrain the distortion in the horizontal or vertical plane producing a cylinder distortion effect (see screenshot 2). Alternatively give the polar co-ordinates filter a try, it remaps pixels from a vertical grid to a polar one, producing a different, more extreme distortion. Lastly, there's the 3D transform filter which you can use to wrap your 2D image around a 3D cube, sphere, or cylinder. Because you can manipulate the object in 3D space, this gives you a bit more scope than spherize. Photopaint 9 also has a spherize filter on the Effects/3D Effects menu.

Q In the past few weeks, for no apparent reason, my Epson 870 printer (pictured right) has been adding a strong cyan/magenta cast. I first noticed this when printing a file I'd printed a few months back – the original matched the screen but the new print certainly did not.

I've tried to print other files again, none of which look the same as they did previously, so it can't be this particular file that has been corrupted. After checking that the printer had the correct colour profile, I re-installed the drivers and thus the colour profile in case they had somehow been corrupted, but this has made no difference.

The only change that I have made recently is to install a new colour cartridge, and I wonder if this is somehow faulty. I have been to Epson's website and sent an email concerning this but the company has not replied.

Have you any ideas on what might be causing this?

Bob Isgar

A Try running the cleaning routine. Your Epson printer driver should provide an option to do this and to produce a test print that prints a pattern of lines – if not all the lines are present it means the nozzles for that colour are blocked. It's not uncommon to have to have to run the cleaning process up to half a dozen times to unblock the nozzles.

If that's not the problem it could be the

paper – are you using the same as last time and are you printing on the correct side (an easy mistake to make with some coated papers)? If none of that works it could be the cartridge, though our experience is that faulty cartridges, whether produced by the printer manufacturer or a third party are rare.

Spreadsheets

Q Using Lotus 97 I have made a timesheet with times for clocking in and out at work. I have the times in and out, and total hours per day in time format (hh:mm). In a separate column, how do I add each day's total to the total of the day in the row above, allowing them to exceed 24 hours? On trying to add them, they start totalling from zero again if the value rolls past 24 hours. I want my boss to be aware I work long hours each week!

Timothy Belsten

A If you look at the Lotus 1-2-3 Smartmaster Template named 'Fill out a Time Sheet' you'll see that its formatting is not hh:mm but a Fixed Number, with two decimals. Spreadsheets record a date as a number, counting from a specific date. Some use Jan 1st, 1900. Time is a fraction of that number. But you're not recording and adding specific times – just numbers of hours. If you work 7.5 hours enter 7.5 hours and not 7:5 or 7:30. You'll find that your hours will add up to an impressive number that way.

Q If I highlight a column of figures in Excel and look at the total displayed by Autocalculate in the Status Bar it often differs from that produced by the SUM function at the bottom of the column. Why is this?

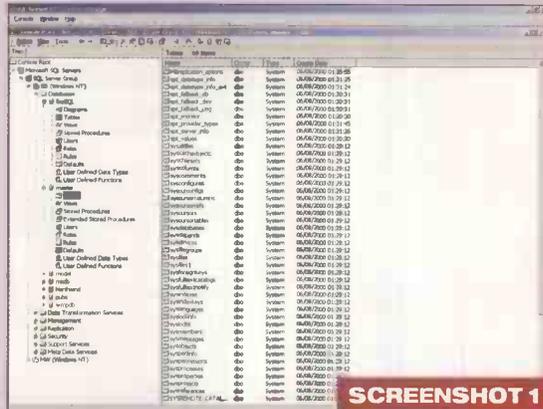
Sam Schwind

A I think it is very likely that your list has one or more hidden rows. Autocalculate will only total the highlighted values on the visible rows, while SUM will total the values in the column for all the rows. If you want a function which will reflect the filtered version, use SUBTOTAL.

Q Can I copy a range of cells in Excel other than using Copy and Paste?

Matthew Mills

A Just highlight the range and point to one edge of the highlight. The pointer turns into an arrow. Hold down the Ctrl key and drag the range to another place on the worksheet.



SCREENSHOT 1

MSDE is a robust database, but it lacks the sort of GUI interface that we have come to expect with a back-end database engine

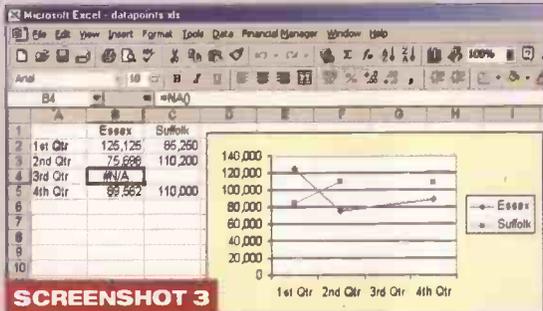


SCREENSHOT 2

Photoshop's spherize filter can help convert a square image to a round one



Printer problems? Try cleaning the nozzles to even out the colour distribution



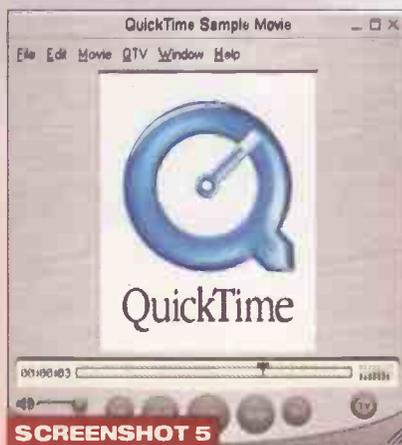
SCREENSHOT 3

Allowing for missing data points

Day	Clock-in (PM)	Clock-out (PM)	Time Worked	Accumulated Total
Sat	1:25	5:35	4:10	4:10
Mon	1:25	5:35	4:10	8:20
Tues	1:25	5:35	4:10	12:30
Wed	1:25	5:35	4:10	16:40
Thurs	1:25	5:35	4:10	20:50
Fri	1:25	5:35	4:10	25:00
Sat	1:25	5:35	4:10	29:10

SCREENSHOT 4

How to accumulate times in Excel



SCREENSHOT 5

Quicktime – restrict it to showing movies

Q When I have no data for one point in a line chart I'd like Excel to connect the previous and following points. If I leave the entry cell blank, there is a gap in the line. If I enter a zero, the line drops down to zero on the chart. Is there a way around this?

Louise Machin

A Yes. In the blank cell enter =NA(). You'll see in screenshot 3 that there are no results for the third quarter. The Suffolk column leaves the cell blank so there is a gap in the Suffolk line. But entering this seldom-used function causes the Essex column to display an error message in row four and the line on the chart is continuous from the second quarter to the fourth quarter.

Q How can I enter hours and minutes in Excel 97 and have a third column total the data in hours and minutes format, not in decimal parts of a hour?

Bill Jones

A Further emails between us established that you want to total times you have worked. If you use column B for entering your clocking-in times, and column C for your clocking-out times, you should enter the hours and minutes using a colon (as 1:25 and 5:25). Give both these columns the custom format h:m. Column D has the same format, enter the formula =C4-B4 and drag it down the column. This is the total time worked each day or session. Column E can carry an accumulated total, =D5+E4, dragged down the column. The appropriate custom format for this column is [h]:mm. Microsoft says square brackets in an Excel custom format denote elapsed time. But you could also call it accrued time. When you use the square brackets, Excel will convert every 60 minutes in a total of times into another hour. Any remainder is given, not as a decimal fraction of an hour, but in minutes, as you require (see screenshot 4).

Windows

Q I refer to your Windows column in the March issue and write to ask if the file 'user.dat' is of the same variety as 'index.dat' and whether it can be reduced back to embryonic size using the same method?

Nigel Young

A No, user.dat, system.dat and classes.dat files are essential parts of the Registry and should be left well alone.

Q I recently had problems printing charts from Microsoft Flight Simulator that are in gif and set up to use Quicktime Player. I use a Lexmark Z42 printer and Windows ME. The paper ejects without printing, or at best prints top and bottom of the paper but not the middle. I have had some success but not of any quality. There is not a printer icon listed in Device Manager, but I had always believed that all items connected to the PC would be listed, and wondered whether this might be part of the problem? Otherwise the printer performs quite well, considering it is a relatively inexpensive machine – aside from charts using Quicktime.

Jim Carless

A To answer the second question first, the lack of a printer icon in Device Manager is normal. You can access the Printer properties from Start, Settings, Printers or from Control Panel, Printers. Your problem is with Quicktime, which is primarily a tool to display Quicktime movies and other multimedia (see screenshot 5). Using it to print gif files is rather like digging your garden with a hammer: we've tried it (printing, not digging) and the results were awful. Go to Quicktime's Edit menu and choose Quicktime Preferences. From the dropdown list select File Type Associations and untick both the Windows and Internet file types before closing the dialogue. Windows ME should then revert to using its own Image Viewer for showing gif and other common graphic formats, which will also make a far better job of printing them.

Q I've noticed that in my temporary Internet files on Internet Explorer 6 the cookies listed now have my full name shown with the cookie name, eg myname@amazon.co.uk. I've also noticed when Installing certain software on my Windows 98 computer, if I click to register the software, the box where it asks me for my name is already filled in with my full name. Where in Windows 98 is my name stored? And is my name being displayed to websites that I visit?

Phil

A The answer to the first question is that the name is stored in the Registry at HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\Current Version – RegisteredOwner. The answer to the second question is no, not unless you have explicitly filled in a form on a particular site, such as Amazon, so that it remembers you.

Windows 2000

Q My Internet connection icon has disappeared from the Taskbar. I opened Network and Dial-up Connections to edit the settings but the folder was devoid of all connections. When I tried to create a new connection with the same name as the missing one I got a warning that the connection already existed. I accessed the connection settings from Internet Options in Control Panel but the 'Show icon in taskbar when connected' option was already selected!

Ian Balls

A Several of you have encountered the same esoteric problem. As the saying goes, misery loves company! The common factor for everyone who experienced this problem is that they were all using a BT dial-up or ADSL connection and had installed the accompanying BT software. Fortunately this problem turns out to be a nuisance rather than a show stopper, because Internet connections continue to work even though the icons have disappeared from the Taskbar and the Network and Dial-up Connections folder.

The solution is relatively straightforward and is documented in the Microsoft Knowledgebase at <http://support.microsoft.com/default.aspx?scid=kb;en-us;Q254631>. Scroll down to the bottom of the article and follow the advice under the heading: Register the following DLLs.

Word Processing

Q My Word 2000 has done something odd and I cannot find a way to clear it. In the last line of a table column of figures, the sum has disappeared from every table where it is used and been replaced by {=SUM(ABOVE)}. I can delete this but when I block the cell, go into Table, Formula and accept =SUM(ABOVE), the one in curly brackets is simply put into the cell. If I then right-click on the cell and select 'Update field', nothing happens.

Clive Pygott

A It sounds as if you have 'View Field codes' enabled: if you go to Tools, Options, View you can untick this, and the result of the code, rather than the code itself, will be shown. On a standard Word installation, Shift & F9 toggles field codes on or off (see screenshot 6).

Q Where does Word 2000 store the list of files that appears when you click on the arrow beside the File Name

box in the Save As dialogue? It seems to be independent of the List in the File menu and I can't find it with a Reglstry search.

Jeff Quayle

A It is in the Registry, but in binary form, which is why a search won't find it. Go to HKEY_CURRENT_USER\Software\Microsoft\Office\9.0\Common\Open Find\Microsoft Word\Settings\Save As\File Name MRU and click on the value named Value, an edit box will appear showing the hex code and a text translation. Back up the Registry before making any alterations.

Q A while ago you included an article explaining how to change the resolution of the 'snap to grid' in the Microsoft Office drawing tools. Could you remind me how this is done?

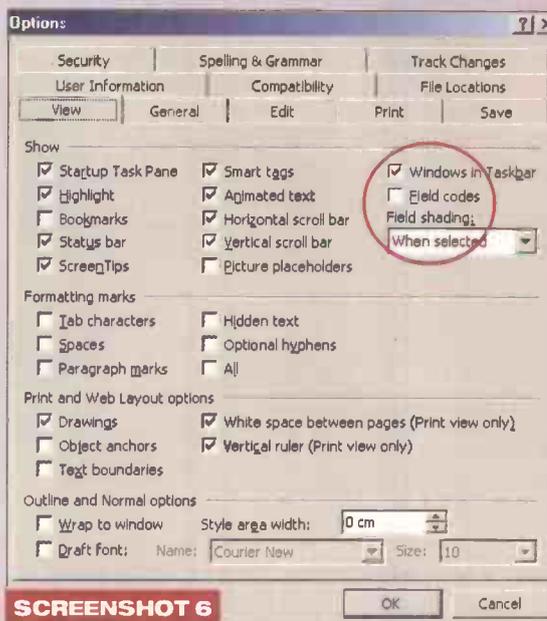
Simon Churchill

A This was mentioned, but only in passing, in the March column, so you may well have missed it. All you do is click on the Draw menu on the Office Drawing Toolbar, and then Grid... all the grid and snap options will be revealed (see screenshot 7).

Q I installed Office 2000 Professional on my Dell Inspiron notebook, and Word does not run: it crashes the computer with out of memory and dangerously low resource warnings. I have uninstalled and re-installed with same problem. I can get it to work with the winword.exe /a command switch. Is a previous installation still affecting Word 2000? Word 97 works with no problem.

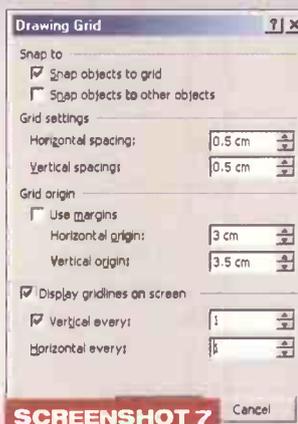
Ian Cooper

A When you start Word with the /a switch this disables all global templates and add-ins, so it looks as if one of these is responsible for the problem. Open the Microsoft Office 2000\Office Startup folder and move the contents to a temporary folder elsewhere. If Word then starts normally, move the files back in one at a time until the fault re-occurs - you will then have isolated the culprit. If Word still crashes, then the problem is with normal.dot. Rename this, but keep the .dot extension and Word should then start normally, rebuilding a clean normal.dot. If you have macros, styles or autotext entries in the renamed normal.dot that you want to rescue, you can do this with the Organizer (Tools, Macro, Macros, Organizer). Take care when copying any Auto macros back, these might be the cause of the problem.



SCREENSHOT 6

Disable Field codes to see the results of the code rather than the code itself



SCREENSHOT 7

Grid and snap settings for the Office drawing tools

CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

3D Graphics: 3d@pcw.co.uk

Ecommerce: ecommerce@pcw.co.uk

Databases: database@pcw.co.uk

Graphics & DTP: graphics@pcw.co.uk

Hardware: hardware@pcw.co.uk

Networks: networks@pcw.co.uk

Sound: sound@pcw.co.uk

Spreadsheets:

spreadsheets@pcw.co.uk

Linux/Unix: unlx@pcw.co.uk

Visual Programming:

visual@pcw.co.uk

Web Development: webdev@pcw.co.uk

Windows: win@pcw.co.uk

Windows 2000: win2000@pcw.co.uk

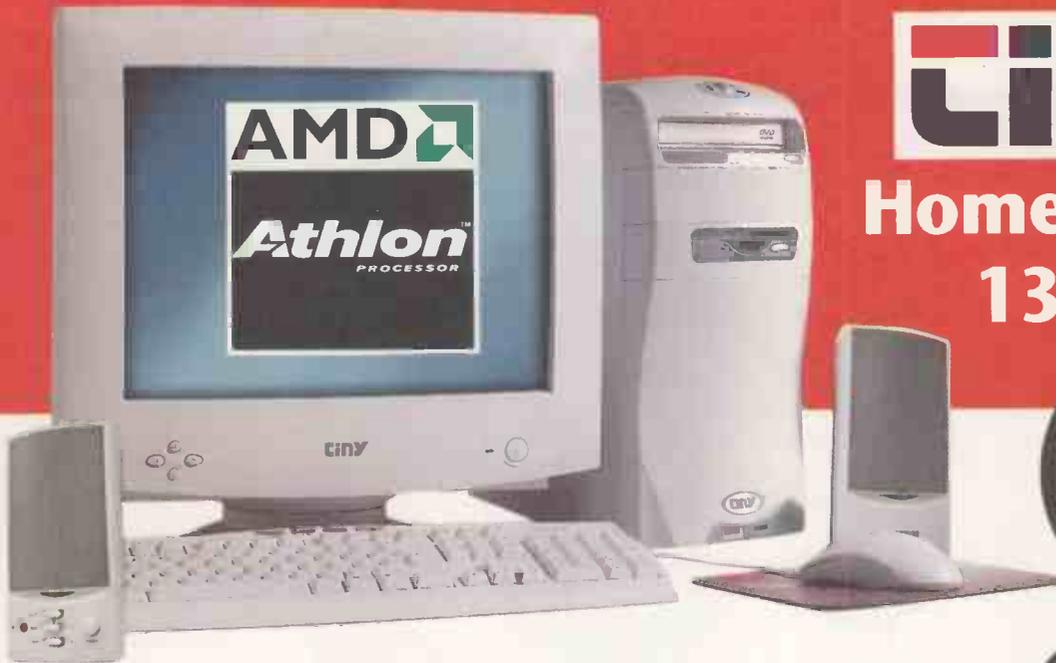
Windows XP: xp@pcw.co.uk

Word Processing: wp@pcw.co.uk

Please do not send unsolicited file attachments.



Home/Office
1333 CDR



Tinny are redefining great value by offering this amazing Home Office 1333 CD-R Package that includes a powerful PC system, Photo Printer and Digital Camera – all for just £499 +VAT.

- AMD Athlon 1333MHz Processor
- 40GB Hard Disk
- 128MB PC133 SDRAM memory
- CD-Rw CD-Rewriter/ CD Copier Drive
- DVD-ROM Drive (combo)
- 15" SVGA colour screen (17" £40 extra)
- 56K V92 Modem and supanet Internet Access
- 1.44MB floppy drive, Wheel Mouse and Multimedia Keyboard
- 3D wavetable stereo sound system and integrated graphics
- Cyberlink Power Software
- 4 x USB ports, Midi, Joystick, Serial, Parallel
- Microphone, Modem and Audio ports.
- Microsoft Windows XP
- Printer: Epson C40 1440dpi photo quality printer
- Digital Camera: Portable 3 in 1 digital camera.

40GB
Hard Disk

128MB
SDRAM
Memory

**CD-RW
/DVD**
Combo Drive

**AMD
1333MHz**
Processor

Everything
For Just

£499 +VAT

£586.33 Inc. VAT

Prices exclude delivery

1333 DDR Model

As above, but includes the following:

- 256MB DDR PC 2100 RAM Memory
- 17" high resolution SVGA CRT Screen
- 10/100 Ethernet built-in for ADSL/broadband internet router and networking
- 32MB AGPx4 Savage S3 graphics with vacant AGP slot for future expansion
- 6 Top games including Quake III and Unreal Tournament

ONLY
£99 +VAT
= £116.33
inc VAT
extra

POWERED BY
DDR
MEMORY™



www.tinny.com

ORDER DIRECT

0870 8303 101

Lines open: Monday to Friday 9.00am to 7pm
Saturday 9.00am to 5.00pm; Sunday 10.00am to 4.00pm

10

Reasons why this is the best £499+VAT PC package EVER!

Power Models include the following extras

- Upgrade to Epson C60 2440 dpi Photo printer
- New high-spec. FashionCam Digital Camera – with built-in flash, 8MB memory and improved picture quality.
- Gamepad
- Headset microphone
- Sun Star Office Suite (7 packs compatible with Microsoft Office Professional)
- GSP Desktop publishing suite (5 packs)
- DK Encyclopedia of Science 2
- DK Ultimate Human Body 2

£99 +VAT = **£116.33** extra

1333 Power 00114 1333 DDR Power 00115



- 1 Higher Performance Processor:** Unbeatable power in a Windows XP £499 +VAT package with AMD Athlon 1333 MHz 266 bus processor. More power than our Pentium 4 1800MHz PC!
- 2 More Storage:** 128MB RAM and 40 GB Hard Disk storage for all your programs (256MB DDR memory with PC2100 DDR technology on DDR model to further boost performance)
- 3 CD-Rw Rewriter/CD Copier System:** For backups, removable storage and copying your own music and software CDs
- 4 DVD System:** Allows you to watch DVD movies and run DVD games and encyclopaedias
- 5 Digital Photography:** with portable 3 in 1 digital camera which can also be used for short video clip movies and videophone. Take a picture, load onto PC and print out on the supplied photo printer!
- 6 The Best Display:** Superb 15" CRT screen included. 17" CRT screen with crisp sharp display on DDR model!
- 7 Future-Proof:** Expandable Tiny case with 180W power supply and all standard ports including 4 USB ports. (Vacant AGP slot and 32MB s3 Graphics on DDR model).
- 8 Epson C40 Printer:** 1440 dpi photo quality dual cartridge printer.
- 9 Internet Ready:** Includes 56K modem and supanet internet access. Fitted 10/100 ethernet network card providing RJ45 port for networking or ADSL broadband internet router on DDR model.
- 10 Ergonomic and Easy To Use:** Includes Multimedia 'hot key' keyboard and Logitech Wheel Mouse. Windows XP preloaded – simply plug and go!

Special offer prices exclude courier delivery = £42.54 +VAT = £49.99. £499 +VAT offer only available direct and not on credit. REPAYMENT EXAMPLES - NOTHING TO PAY FOR 6 MONTHS - PC cash price £1000 inc VAT. Pay just the CASH PRICE on or before due payment date alternatively pay 42 monthly payments of £45.75. Total amount payable £1783.86 (APR 29.8%). Interest calculated from day one of the agreement. Written quotations upon request. Finance subject to status. Tiny is a registered trademark. Price and specifications are subject to change without notice. Sales subject to standard conditions (available on request) and availability. E&OE. *V.I.S. = Viewable In-screen. Select required printer cable/starter kit. TINY COMPUTER SYSTEMS LTD, SIMONSTONE, BURNLEY BB12 7TG

Tiny PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

29.8%
APR

THE UK's No1 INKJET SUPPLIER

Web. www.mx2.com
 Tel. 01481 740200
 Fax. 01481 740300
 Email. sales@mx2.com



LEXMARK

NEW 10N0016	BLK	£17.99
NEW 10N0026	CLR	£17.99
17G0060	CLR	£17.99
17G0050	BLK	£17.90
13619HC	CLR	£23.50
13400HC	BLK	£17.99
12A1970	CLR	£17.99
12A1975	BLK	£28.90
12A1980	CLR	£25.90
12A1990	PHOTO	£27.99
15M0120	CLR	£26.45

NEW LEXMARK COMPATIBLE

IT-12A1970	BLK	£13.90
IT-12A1980	CLR	£14.75
IT-12A1990	PHOTO	£15.90
IT-13619HC	CLR	£19.50
IT-13400HC	BLK	£14.75
IT-17G0050	BLK	£14.85
IT-17G0060	CLR	£14.65
IT-15M0120	PHOTO	£15.90

INKJET PAPERS

MX2's comprehensive and best selling range of compatible inkjet papers, provides high quality output and ultimate value for the enthusiast.

Photo Glossy 150g Only 15p per sheet
 CP100 A4 Photo Glossy 150gsm
 NEW CA240 A4 Artist Watercolour Paper 240g
 NEW CDKIT CD & Zip Kit (50) Free CD Software
 NEW CHF A4 Silver Holographic Film

NEW ICI Olmec Inkjet Papers
 NEW 310gsm Art Paper single-sided
 NEW 270gsm Photo Matte 2 sided
 NEW 230gsm Photo Glossy single sided
 NEW 170gsm Photo Matte 2 sided

Photo Glossy Papers

NEW CP274	A4 ICI Photo Glossy 2 sided 270g (20)	£13.99
CPR0A3	A3 ICI Photo Glossy Paper 260g (20)	£17.75
CPR0B3	A4 ICI Photo Glossy Paper 260g (50)	£16.99
CPR020	A4 ICI Photo Glossy Paper 260g (20)	£8.50
CPR064	6x4" ICI Photo Glossy Paper 260g (20)	£5.50
CS26A3	A3 ICI Photo Satin Paper 260g (20)	£17.75
CS2650	A4 ICI Photo Satin Paper 260g (50)	£16.99
CS2620	A4 ICI Photo Satin Paper 260g (20)	£8.50
CP22-3P	A3+ Photo Glossy/Photo Matte 220g (20)	£17.99
CP22-A3	A3 Photo Glossy/Photo Matte 220g (20)	£15.99
CP22-50	A4 Photo Glossy/Photo Matte 220g (50)	£14.50
CP22-20	A4 Photo Glossy/Photo Matte 220g (20)	£7.99
CRDAS	A5 Glossy Greeting Cards 220g (20)	£7.99
CP22-AS	A5 Photo Glossy/Photo Matte 220g (20)	£4.75

Photo Matte Papers

NEW CM314	A4 ICI Super Heavy Artist Paper 310g (20)	£13.99
NEW CA240	A4 Artist Watercolour Paper 240g (10)	£5.99
NEW CM234	A4 ICI Photo Matte 230g (50)	£9.99
CMH3P	A3+ Photo Matte 2 sided 210g (20)	£11.00
CMH43	A3 Photo Matte 2 sided 210g (20)	£9.99
CMH	A4 Photo Matte 2 sided 210g (50)	£9.99
NEW CM1750	A4 ICI Photo Matte 2 sided 170g (50)	£9.99
NEW CM17100	A4 ICI Photo Matte 2 sided 170g (100)	£12.99
CAN43	A3 Canvas Photo Paper 140g (20)	£13.50
CAN44	A4 Canvas Photo Paper 140g (20)	£5.99
CHR3P	A3+ Photo Matte 2 sided 130g (50)	£15.50
CHR43	A3 Photo Matte 2 sided 130g (50)	£12.50
CHR	A4 Photo Matte 2 sided 130g (100)	£7.75
NEW CM120	A4 ICI Photo Matte 120g (100)	£7.99

Specialist Products

CMETAL	A4 Silver Metallic Film (10)	£6.99
NEW CHOLO	A4 Silver Holographic Film	£7.95
CTFR	A4 Transfers for T-Shirts etc. (10)	£7.99
CLING	A4 Cling Film 720 (10)	£7.50
NEW CMAC	A4 Magneto Photo Sheets (5)	£7.99
CLEAR	A4 Transparencies for Projectors (20)	£7.50
CLAM	A4+ DIY Laminator for Menus etc. (10)	£6.99
CBUS	DIV Laminator for Business Cards (50)	£5.99
NEW CDKIT	CD & Zip Kit (50) Free CD Software	£11.99
CDM2	Photo Matt CD Labels 2 per A4 (2x10)	£5.99
CD3	Photo Glossy CD Labels 2 per A4 (2x10)	£6.50
CD2	Photo Glossy CD Labels 3 per A4 (3x10)	£6.50
CBG	Business Cards 220g (10x10)	£5.75
NEW CAB	Art Canvas Business cards 10 per A4 (10x10)	£5.99
CA20	Address Labels (adh) 10 per A4 (10x10)	£5.99
NEW CMOUSE	DIY Mousemat Kit (2)	£5.90

Canon

BC01	BLK	£13.90
BC02	BLK	£13.75
BC05	CLR	£16.50
BC06	PHOTO	£13.99
BC10	BLK	£23.50
BC-20	BLK	£17.99
BC-21	Print Head	£29.99
BC-22	PHOTO	£15.99
BC-23	BLK	£17.99
BCI-3	BLK	£7.90
BCI-3	C/M/Y each	£5.90
BCI-5	BLK	£6.99
BCI-5	C/M/Y each	£6.90
BCI-5	PM/PC each	£6.90
BCI-6	C/M/Y each	£6.50
BCI-6	PM/PC each	£6.50
BC-30	BLK	£17.99
BC-31	CLR	£23.99
BC-32	PHOTO	£24.99
BC-50	Print Head	£64.50
BC-60	BLK	£17.99
BC-61	CLR	£23.50
BC-62	PHOTO	£31.00
BCI-10B	BLK x3	£9.50
BCI-11B	BLK x3	£6.99
BCI-11C	CLR x3	£11.90
BCI-21B	BLK	£4.99
BCI-21C	CLR	£9.50
BCI-24B	BLK	£5.90
BCI-24C	CLR	£9.50
BCI-61	CLR	£13.50
BCI-62	PHOTO	£25.50
BJI-201B	BLK	£5.90
BJI-201	C/M/Y each	£5.50

Canon

NEW PR-101	A4 Glossy Photo Paper (15)	£8.50
GP-301	A4 Glossy Photo Paper 165g (20)	£6.90
HR101	A4 Photo Matte Paper 90g (200)	£16.50
HR101	A4 Photo Matte Paper 90g (3x50)	£12.00
HR101	A4 Photo Matte Paper 90g (50)	£4.99
TR201	A4 T-Shirt Transfers (10)	£8.50

CANON COMPATIBLE

SAVE UP TO 70% ON CANON INK
 Print-Rite Canon Inks for the Ultimate Value.

NEW C-BC001	BLK	£9.95	2 PK	£17.50
NEW C-BC002	BLK	£9.90	2 PK	£17.80
C-BCI-5B	BLK	£3.99		
C-BCI-5	C/M/Y	£3.99		
C-BCI-10B	BLK (x3)	£4.99	2 PK	£9.99
C-BCI-11B	BLK (x3)	£5.99	2 PK	£11.00
C-BCI-11C	CLR (x3)	£7.50	2 PK	£13.99
C-BCI-21B	BLK	£2.75	3 PK	£7.50
C-BCI-21C	CLR	£3.99	3 PK	£11.00
C-BCI-61C	CLR	£7.99	2 PK	£15.00
C-BCI 62	PHOTO	£8.99	2 PK	£17.00
C-BJI201B	BLK	£1.99	3 PK	£5.50
C-BJI201M	Mag	£2.50		
C-BJI201C	Cyn	£2.50		
C-BJI201Y	Yiw	£2.50		

DIGITAL MEDIA

MEMOREX

CDR 80/700MB 12 Speed	each	69p
CDR 80/700MB	10 Pack	£5.99
CDR 80/700MB	50 Pack Spindle	£16.50
CDR Audio 80min	99p each	£10 PK £9.45
CDR 650/74...	99p each	£10 PK £8.99

Hewlett Packard CDR

80min/650MB	79p each	£10 PK £7.50
Kodak Gold CDR 24 Speed		
80min/700MB	79p each	£10 PK £7.49

Memory Stick for all SONY equipment

32MB Memory Stick	£32.00
64MB Memory Stick	£48.50
128MB Memory Stick	£88.75

IOMEGA

CLIK 40MB	each	£7.99
ZIP 100MB PC	each	£6.99
ZIP 100MB MAC	each	£6.99
ZIP 250MB PC	each	£9.75
ZIP 250MB MAC	each	£9.75

Maxell LS-120 120MB Super Disc...£6.75

NEW TDK 5.2Gb DVD RAM...£12.99

HEWLETT PACKARD

6615D	BLK	£17.99
6578D	CLR	£23.90
6578A	CLR	£38.83
6614D	BLK	£17.90
4844A	BLK	£23.90
4843A	MAG	£23.90
4842A	YLW	£23.90
4841A	CYN	£23.90
1823D	CLR 30ml	£23.50
1816A	PHOTO	£22.85
51649A	CLR	£17.99
51645A	BLK	£17.99
51641A	CLR	£23.50
51633M	BLK	£17.90
51629A	BLK	£17.99
51626A	BLK	£17.99
51625A	CLR	£23.50

Hewlett Packard Paper

6832	A4 Premium Photo Glossy 230g (20)	£9.50
6951	A4 Premium Photo Matte 230g (20)	£9.50
6040	A4 Premium Photo Paper 220g (15)	£5.99
1847	A4 Photo Glossy Paper 160g (20)	£5.99
51634Z	A4 Premium LX 95g (200)	£10.95
1853	A4 Photo Matte 2 sided 135g (100)	£10.50
6945	15x10cm Prm Photo Paper (20)	£5.99
6050	A4 Iron-on Transfers (10)	£9.99
8042	Greeting Cards + Env. (20)	£5.49
3832	A4 Transparency Film (20)	£12.00

H.P. COMPATIBLE

QUALITY RECONDITIONED HP CARTRIDGES FROM KMP & IT IMAGE

C-1823D	CLR	£13.30
C-51625A	CLR	£12.99
C-51625A	BLK	£9.99
C-51629A	BLK	£11.90
C-51633M	BLK	£9.99
C-51645A	BLK	£11.50
C-51649A	CLR	£14.99
C-6614D	BLK	£11.90
C-6615D	BLK	£11.90
C-6578A	CLR	£15.99

Vectorjet Refill Kits & Inks

Refill your empty cartridges & SAVE ££££

Ink Jetor Kit (Kit without ink)	£2.90
Black Refill Kit (50ml)	£4.90 (100ml) £6.99
Colour Refill Kit (75ml)	£7.90 (150ml) £9.99
Black Ink (125ml)	£4.99 (250ml) £5.90
C/M/Y Inks Each (125ml)	£5.99 (250ml) £6.90
Cleaning Fluid (125ml)	£3.99

DIGITAL CAMERA FOOD

COMPACTFLASH CARDS

18MB	£11.50
32MB	£12.90
64MB	£17.90
128MB	£43.90
NEW 256MB	£78.99
NEW 512MB	£229.00

SMARTMEDIA CARDS

16MB 3.3V	£7.90
32MB 3.3V	£9.70
64MB 3.3V	£16.90
128MB 3.3V	£49.90

Digital Accessories

Integral Dual Compact/Smart Reader/Writer	£24.99
Integral Smart Media PC/MCIA Adaptor	£17.99
Integral Compact Flash PC/MCIA Adaptor	£6.90

DIGITAL VIDEO FOOD

SONY DVM 60min Premium (no chip)	£4.90
SONY DVM 60min Excellence (with chip)	£9.99
Panasonic AV-DVM 60min EK	£4.90
SONY HR P5-90 Heavy Metal Particle	£4.99
SONY 8mm P5-90 Metal Particle	£2.20
SONY 8mm P5-90 High Grade	£2.99

EPSON

MX2 is the UK's largest seller of EPSON Inks & Photo papers.

NEW T032440	Yellow	£9.99
NEW T032340	Magenta	£9.99
NEW T032240	Cyan	£9.99
NEW T032140	BLK	£17.90
NEW T029401	CLR	£15.90
NEW T028401	BLK	£17.99
NEW T027401	PHOTO	£12.50
NEW T026401	CLR	£14.90
T020401	BLK	£14.20
T019401	BLK	£15.99
T018401	CLR	£13.99
T017401	BLK	£16.80
T016401	PHOTO	£17.85
T015401	BLK	£16.99
T014401	CLR	£12.25
T013401	BLK	£9.75
T009401	PHOTO	£12.99
T008401	PHOTO	£10.50
T007401	BLK	£12.50
T006401	CLR	£17.90
T003011	BLK	£15.99
T001011	PHOTO	£14.90
20193	PHOTO	£9.90
20191	CLR	£13.90
20189	BLK	£13.90
20187	BLK	£12.50
20138	CLR	£9.99
20110	PHOTO	£9.90
20108	BLK	£13.90
20097	CLR	£14.99
20093	BLK	£12.90
20089	CLR	£13.50

See website for full range of Inks

NEW 41620	A4 Photo Glossy Paper x50	£12.99
NEW 41622	A4 Photo Paper x50	£12.90
41624	A4 Premium Photo Glossy Paper x50	£15.90
41626	A3 Premium Semi-Gloss x50	£33.95
41616	A3 Premium Photo Paper 255g x20	£27.65
41443	A3 Photo Paper 190g x20	£17.99
41284	A3 Photo Matte 167g x50	£27.99
41634	A3 Premium Semi-Gloss x20	£27.65
41615	A3 Premium Photo Paper 255g x20	£25.00
41281	A3 Photo Matte 167g x50	£17.99
41142	A3 Photo Paper 190g x20	£16.65
41125	A3 Photo Paper 120g x20	£16.50
NEW 41330	Premium Semi-Gloss Photo Roll	£10.90
41071	A4 Photo Glossy Film x15	£16.99
41332	A4 Premium Photo Paper 255g x20	£25.00
41287	A4 Premium Photo Paper 255g x20	£8.99
41440	A4 Photo Paper 150g x20	£6.90
41126	A4 Photo Matte Adhesive x20	£6.25
NEW 41560	A4 ColourLife Photo Paper 245g x20	£11.90
NEW 41432	A4 Matte Archival Paper 192g x20	£9.90
41256	A4 Photo Matte 160g x50	£17.50
41106	A4 Photo Matte Adhesive x20	£6.25
41061	A4 Photo Matte Paper 90g x100	£7.50
41154	A4 Iron-on Transfers x10	£6.90
41176	Photo Stickers 5x4	£3.99
41122	10"x8" Photo Card x30	£9.99
41121	8"x5" Photo Card x30	£4.90
41148	8"x5" Cards + Envelopes x10	£5.70
41134	8"x5" Photo Paper 130g x20	£6.99
41446	A6 Photo Stickers x20	£9.90
41046	A6 Photo Card x50	£6.99
41157	A6 Cards + envelopes x20	£5.90

EPSON COMPATIBLE

SAVE UP TO 70% ON EPSON INK
 MX2 is the UK's largest seller of EPSON Compatible Inks & Print-Rite Ink Products are our Best Performing Brand.

NEW C-T029	CLR	£6.90	3 PK	£20.52
NEW C-T028	BLK	£4.99	3 PK	£14.52
NEW C-T027	PHOTO	£6.99	3 PK	£20.52
NEW C-T026	BLK	£5.99	3 PK	£17.52
NEW C-T025	CLR	£3.99	3 PK	£11.50
C-T019	BLK	£2.50	3 PK	£6.99
C-T018	CLR	£2.90	3 PK</	

Make your own movies

In the second section of our two-part workshop, Gordon Laing produces a professional quality DVD

With internal DVD writers dropping to £300 ex VAT and below, the ability to produce your own DVD movies is set to be the killer application of 2002. In last month's *PCW* we looked at how to create basic DVDs and Video CDs. This month it's the turn of those who want a bit more from their DVD projects.

Formats

It's worth briefly reiterating the differences between the current rewritable DVD formats. With DVD-Ram working best as a large PC data storage medium, the two formats vying for the broadest compatibility in the domestic video market are DVD-RW and DVD+RW.

In our tests, only the oldest DVD-Rom drives and domestic players refused to play DVD-RW and DVD+RW discs. But the good news is that all recent players were compatible.

If you want close to 100 per cent compatibility with older drives and players, though, you'll need to use the write-once DVD-R format. Virtual guaranteed compatibility, not to mention lower media cost, makes it the best choice when you want to share home movies or distribute corporate videos.

Pioneer's DVD-RW and Panasonic's latest DVD-Ram models can write to DVD-R discs. While DVD+RW boasts superior rewritable performance, none of these drives can write to DVD-R. The recently announced write-once DVD+R format promises equal levels of compatibility as DVD-R, but it now looks like none of the first-generation DVD+RW PC drives will be upgradeable to support the new blanks.

Until we see how DVD+R performs with brand new DVD+RW drives, we'd recommend anyone wanting to create and share DVD videos should go for a drive that can handle DVD-R. You should also know that Sony plans to release a combination drive supporting DVD-RW, DVD+RW and DVD-R this October.

Professional DVD authoring

Graduating from the basic DVD authoring packages provides the video enthusiast with a vast number of features to play with, not to mention greater control and ultimate quality. Sure, the beginners' packages can create menus and convert video, but the professional versions offer

custom chapter points, richer menus, support for widescreen, multiple audio and video tracks, subtitles, six-channel surround sound and precise control over the quality of format conversions.

The process of producing a

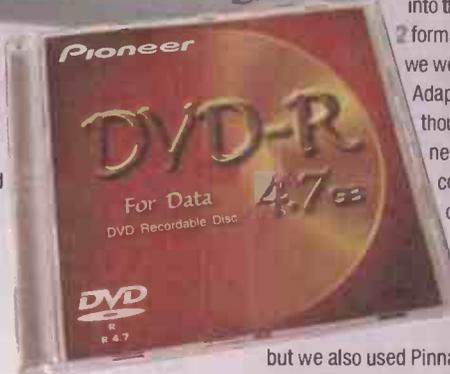
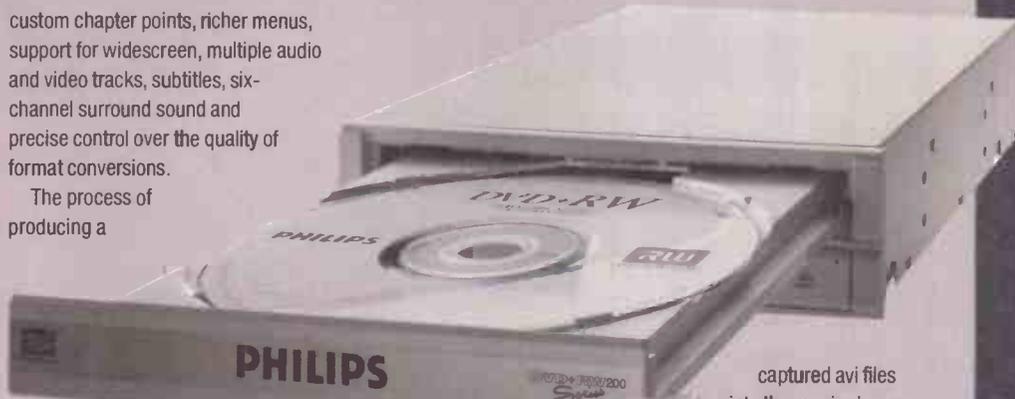
professional quality DVD is essentially the same as a budget one. Start by capturing your footage, editing where necessary, then converting it into the correct audio and video formats required by DVD. Finally you put all the elements together, design a menu and burn the entire project onto a disc. We'll now detail each step and explain our choices.

Video capture and editing

We shot our original footage using a Canon XM-1 DV camcorder and connected it to a PC using a standard Firewire connection – any OHCI-complaint Firewire card will do. In terms of PC specification, video editing demands a big, fast hard disk. An hour of raw digital video (DV) footage occupies around 11GB, so you do the maths.

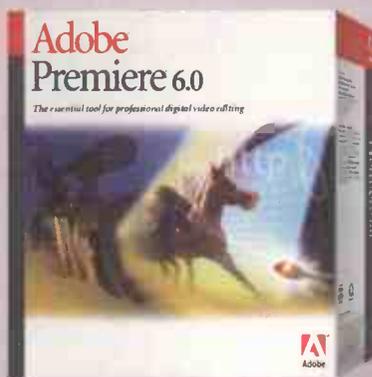
A fast processor and plenty of memory won't hurt either when it comes to rendering effects and converting formats. We used a dual Athlon MP 1800+ PC with 512MB of DDR memory and a 36GB Ultra160 SCSI hard disk, running Windows 2000 Professional.

We used Adobe Premiere 6 to capture and edit our footage, along with adding various transitional effects between scenes. Premiere costs £499 by itself, but is often bundled with many high-end video capture cards. Along with saving money, these bundles normally also include the facility to convert



More advanced DVD authoring gives you greater control and higher quality

Adobe Premiere is a good tool for digital video editing



captured avi files into the required mpeg-2 format for DVD. Since we were using a normal Adaptec Firewire card though, we would need to perform this conversion outside of Premiere.

Premiere is one of the best editing packages around,

but we also used Pinnacle Commotion to create advanced effects. Commotion is a proper special-effects package capable of generating, animating and compositing elements; it costs £379 or £749 in normal and Pro versions respectively.

One of Commotion Pro's neat tricks is motion tracking, allowing animated smoke to emerge from a previously inactive chimney as it moves across the frame.

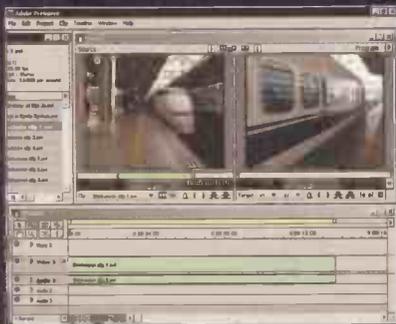
Special effects can also make things, such as unwanted microphones, wires or even people, disappear. We used Commotion's clone tools to remove a hair that had inadvertently become stuck on our lens while shooting.

Once completed, each avi video file was exported from Premiere, carefully ensuring the settings were exactly the same as for capture.

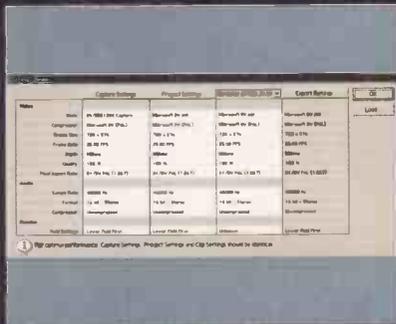
Video conversion

DVD employs an efficient video compression system called mpeg-2, but Premiere natively works with avi files, so a conversion must be performed before continuing. Since our authoring package, Pinnacle Impression DVD Pro 2.1, won't do the conversion either, we'll have to use a separate tool, giving us precise control over the process. The new Impression Pro 2.2 will do conversions.

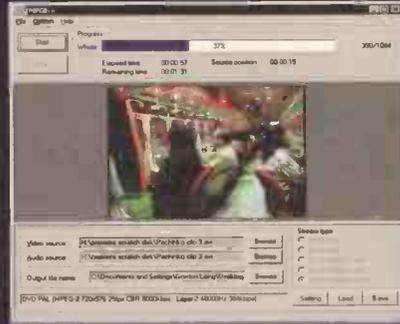
HOW TO CREATE A DVD, FROM GATHERING CONTENT TO BURNING TO DISC



1 The first step in creating a DVD is collecting and editing your content. While this could include separate audio files, still frames and menu elements, the primary content will normally be video clips. We used Adobe Premiere 6 to capture video directly from a DV camcorder using a digital Firewire connection. Once captured as a standard avi file, Premiere can then be used to edit clips and apply effects such as transitions between scenes.



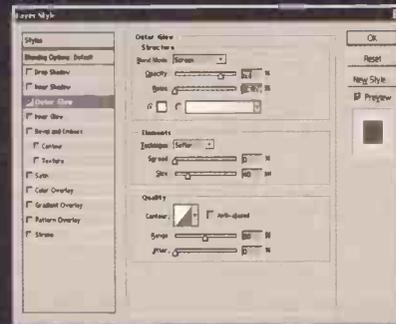
2 If you're using a dedicated video capture card such as those made by Pinnacle, then you will be able to export your edited avi files directly from Premiere into the mpeg-2 format required by DVD. Since we're using a normal Firewire card with Premiere 6 though, the mpeg-2 conversion must take place later. Consequently it's crucial that the edited avi clips are exported using exactly the same DV settings as for capture.



3 TMPG is a software encoder that can convert our avi files into mpeg-2 format. We wanted the best quality, so we loaded the TMPG template to create a Pal DVD using a constant video bit rate of 8,000Kbits/sec. This preset also creates an mpeg-2 audio file, but our authoring package (Pinnacle Impression DVD Pro 2.1) requires a different format. Use the Output to file option in the TMPG File menu to create a wav audio file for each of your avis.



7 Our DVD will feature three video clips, each activated by pressing a button on the menu. We've created these buttons by resizing still images in Photoshop, although Pinnacle Impression DVD Pro 2.1 also allows video clips to be used in buttons or as the background. Each button is placed on its own Photoshop layer, named with a (#) code. When you're composing your menu, remember most TVs will crop the image around the edges.



8 Pinnacle Impression 2.1 allows buttons to be created which change their state when you select them. We wanted buttons that highlighted with a glow when they were selected, so we used Photoshop 6's layer effects to apply an outer glow to duplicates of each button. Above are the options for Photoshop's outer glow effect. We chose a 40 pixel size and a white glow for each of our three buttons.



9 As described in Steps 6 and 7, Pinnacle Impression 2.1 requires that each menu element be placed on a separate Photoshop layer with a specific code in the names. The background name must start with (B), while each button name should begin with (#). The layers containing the selected button images must have the same name as the normal buttons themselves, but be preceded with (@). Above is the layer palette for our completed menu.

Numerous high-end converters are available, but we enjoyed excellent results from the TMPG software encoder. Download a free 14-day trial from www.tmpgenc.net and unlock it for £35.

TMPG offers a number of conversion options, but we wanted the best video quality, so opted for the constant rate at the highest 8Mbits/sec setting.

The conversion process can take minutes or hours depending on your CPU, and the length of the clips.

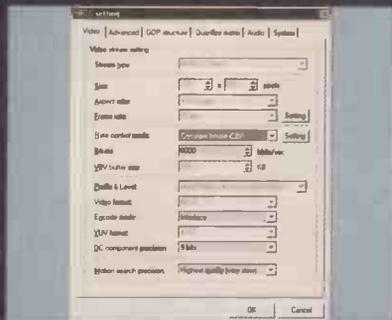
Once completed, you'll have a single mpg file for each clip which contains both the video and audio. Pinnacle Impression 2.1, however, requires separate audio and video files, so the mpg file must be de-multiplexed. TMPG's de-multiplex tools produce separate M2V video and MP2 audio files.

Impression 2.1 can handle all manner of audio formats, but sadly not MP2, so we've also used TMPG to extract a standard wav file from the original avi file.

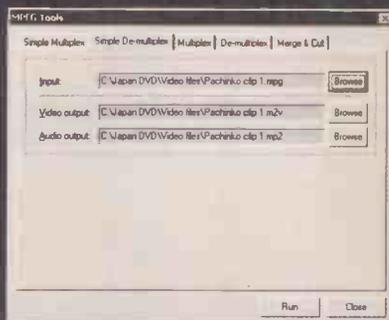
Uncompressed wavs may be much larger than conventional DVD audio formats, but they offer the best two-channel quality and our clips are short in length.

DVD authoring

Our encoded audio and video files are then simply imported into Pinnacle Impression DVD Pro 2.1 and arranged using a standard timeline interface as shown in the workshop. Impression 2.1



4 TMPG is a powerful software encoder with a wealth of customisable settings. While we opted to load the supplied Pal DVD template, you could manually choose your own settings. Most DVDs are authored using a variable bit rate for video, which increases the resources for complex or fast-moving scenes. It's also worth checking TMPG's environmental settings, and dual-processor users should activate the multithreaded options for quicker encoding.



5 Our mpeg files can now be viewed in a software DVD player, but our authoring package requires that the video and audio portions are extracted as separate files. TMPG offers the required 'de-multiplexing' options from the mpeg tools in its File menu. This takes an mpg file and separates it into M2V video and MP2 audio files; note though that we'll be using the wav file created earlier, instead of the MP2 for audio.



6 The next step is to create the opening menu for the DVD. While Pinnacle Impression 2.1 can create menus, far greater flexibility is available by using a layered image in Adobe Photoshop. The first step is to create a background image. We've taken a still image and resized it to the 720 x 576 pixels required by the UK Pal video system. Impression requires the background image be placed on a layer named with a (B) code.



10 Here's the final menu image with all three buttons showing their highlighted states. Notice the buttons have been positioned deliberately away from the edges so they won't be lost when the image is later cropped by a TV set. Preview modes can't truly reveal what the menu will look like on a TV though, so you may need to return and modify the menu, to adjust brightness or colour, along with composition.



11 Now we can put all the elements together using Pinnacle Impression. Simply import each asset one at a time and drag them from the lower left window into the timeline at the top; the menu is imported as a Photoshop psd file and the video and audio are separate M2V and wav files. Clips are then linked to the menu by dragging them from the timeline onto the relevant button in the lower right preview window.



12 All that's left is for Pinnacle Impression 2.1 to take all the elements and build a DVD with them. As time goes on, more DVD writers will be supported by Impression, but if yours isn't supported today, then simply choose the option to compile and create a UDF (universal disk format) image only. This img image file can then be opened in, say, the latest version of Ahead Nero and subsequently written to any DVD writer.

costs £349, although prospective buyers should also consider Sonic Solutions' excellent DVDit, available in SE and PE versions for £299 and £599 respectively.

While Pinnacle Impression 2.1 can make its own menus, we've gone one step further and created a more sophisticated interface using a layered Adobe Photoshop image, as explained in the workshop.

A 'light' version of Impression 2.1 is often bundled with some cards, which supports single audio and video tracks.

The full version can handle multiple audio and video tracks, not to mention subtitles, allowing you to cater for foreign languages or make your own director's commentary.

All that's left is for the image to be burnt onto a DVD, or even a CD if the project measures less than 700MB – remember, though, that DVD video on CD will normally only play on a PC drive. If Impression 2.1 doesn't support your writer, import the image into an alternative writing package such as Ahead Nero 5.5.

CONTACT

Adobe www.adobe.co.uk; Pinnacle www.pinnaclesys.com; Sonic Solutions www.sonic.com or www.unlimited.com
Thanks to DVC for advice and support, 01273 707 200 www.dvc.co.uk

We welcome queries and comments on this month's workshop. Contact us via the PCW editorial office or email: letters@pcw.co.uk. Please do not send unsolicited file attachments.

Searching for a shortcut

Tim Nott untangles the answers to some frequently asked Windows questions

This month I've received several queries which are all frequently asked questions, but don't fit in terms of size or scope into the Question Time section.

The first is a Microsoft Outlook question. Since, unlike Outlook Express, the full Outlook is not part of the Windows operating system, it's arguable that I shouldn't be writing about it. But this is a trick question: 'How do I get Outlook's calendar to show the day of the week in daily or weekly view?' A rider to this continues: 'I've searched all the menus, options, help file etc, to no avail.'

The answer to the question lies not in Outlook, but in Windows. You need to go to Control Panel, Regional Settings and change the long date style. By default this is usually of the form dd MMMM yyyy, which yields 05 August 2002.

If you prefix the style string with dddd, this will yield Monday 05 August 2002. Three ds instead of four returns an abbreviated weekday.

While straying into Outlook territory, here's a quick tip I couldn't resist, as it answers that ancient Windows mystery - 'How do I print a folder contents listing?'

The conventional method is to open a command prompt window, navigate to the chosen folder and type: `dir > myfiles.txt`. This will create a text file of the folder contents that can then be printed from Notepad.

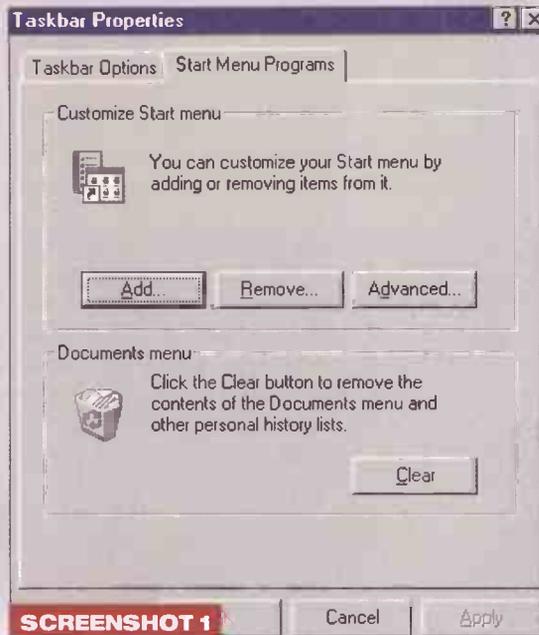
However, Outlook users have another way. Click on the Other Shortcuts button in the Places bar, and you will be able to navigate down through the file system. Having reached the folder you want, hit the Print button, and then choose Table Style. The listing will then be printed out in a neat table.

Recent developments

Reader Bill Leeson wondered why the Windows/Recent folder had hundreds of files in it which seem to serve no useful purpose at all.

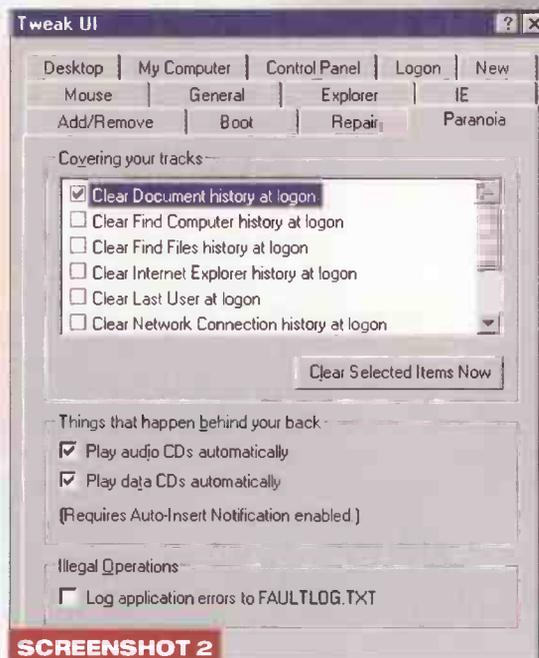
'They all seem to be shortcuts to files. What are they for and can they be safely deleted?' asked Bill.

Answering those questions in order, yes, they are shortcuts, providing a quick way of getting at recently opened files. This is all very well, but it's a feature that has never been very well implemented.



SCREENSHOT 1

Clear the recent file list once...



SCREENSHOT 2

...or every time you start

In Windows 98, not all documents you open make it to the menu - it depends on the application and how you open it. In any event, the contents of the Recent folder seems to correspond to the maximum number of entries in the Documents menu (15), maintaining a first in, first out policy.

Windows ME shows no such restraint - or logic for that matter. Although a spot check shows 15 items in the Documents

menu, the Windows\Recent folder contains 108 shortcuts.

This is partly explained by the common File Open dialogue for the Windows applets such as Notepad and Paint - each will show its own recent files if you click the History icon on the left.

Moreover, the Documents menu doesn't always seem to correspond with files I've been working on recently. Finally, neither the Documents menu nor the Recent folder is smart enough to notice when you move or delete a document - the shortcut stays put, pointing at nothing.

So, in answer to Bill's last question, the shortcuts certainly can be deleted, and there are several ways of doing this. First, you can delete one, several or all shortcuts in the normal way from the Recent folder (see screenshot 1).

In Windows ME this can be a fraught business as, irrespective of the confirmation setting in Recycle Bin properties, Windows will ask if you are 'sure you want to delete...?' Worse still, if you only delete one shortcut, say to Myfile.txt, it will ask if you want to delete 'Myfile.txt', which suggests it's about to delete the file itself, not just the shortcut. Fortunately this is just sloppy messaging - the actual file will not be deleted.

An easier way to clear the Recent folder is to go to Start, Settings, Taskbar or right-click on a blank part of the Taskbar and choose Properties. Turn to the Start Menu Programs tab (Windows 98) or Advanced tab (Windows ME), and you can clear the contents. This may also clear other lists, such as the dropdowns from the Start, Run box and the similar lists of typed URLs in the IE Address box.

If you'd like to relieve yourself of this chore then you need Tweak UI. If you haven't got this Microsoft add-on, download it from www.microsoft.com/networkstation/downloads/power toys/networking/nttweakul.asp.

Despite the URL this isn't just for NT - it works with 95, 98, ME and 2000 as well. Once installed, start Tweak UI from Control Panels, and go to the Paranoia tab, where you can elect to have Windows clear the Document History automatically every time you start Windows (see screenshot 2) - there are also similar options for other historical lists.

If you'd like to get rid of the feature entirely, the Tweak UI IE tab has an option

to disable adding new document shortcuts to the Start Menu. This appears to disable the addition of shortcuts to the Recent folder completely, so you won't see anything under History in the ME applet Open Dialogs, nor in third-party programs that depend on this.

Look out

In April's Question Time I answered Wayne Freke's query on why he couldn't open certain attachments in Outlook Express 6.

To recap briefly, OE6 won't let you open potentially dangerous attachments, such as .exe or .vbs files, unless you turn off this safety feature in Tools, Options, Security. Vivian Dunn points out that if you click the Forward button, the attachment appears in the Attach box in the new message where it can be opened or saved normally. I'm not sure I'm pleased by this handy loophole, or depressed by Microsoft's sloppiness in allowing it.

On a related matter, I've had a great tip from Peter Yates concerning worms that propagate themselves by using your Outlook Express address book.

Add a new contact, giving it the first name !000 – yes, that's an exclamation mark and three zeros – and the email address of Wormalert (see screenshot 3). Don't fill in anything else. Click the Add button, override the warning that the email address is not valid and click OK.

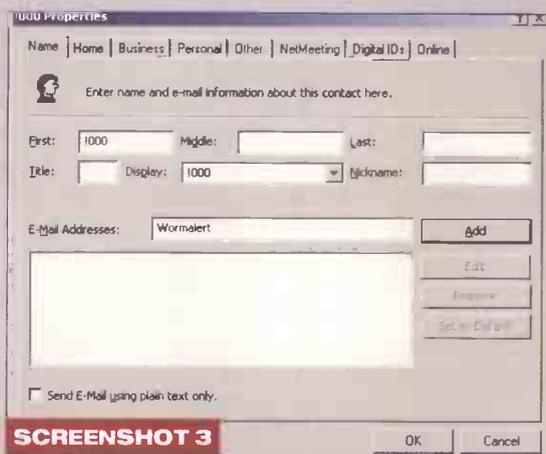
Unless you have some very strange contacts you will now have !000 as the first entry in the list. If a worm attempts to send itself to all the contacts in the list, it will start here. But the attempt will fail, because of the invalid address, the process will go no further and none of your other contacts will be mailed.

Furthermore you will get a warning in your Inbox informing you of the failure, so you will immediately know that you've been wormed and can take appropriate action. So far, so good, but there are some reports that the name !000 doesn't stay at the top of the list. And in addition any minimally competent worm writer should be able to get round this by ignoring !000.

I would advise using a different, but alphabetically prior name – or even two, in case the worm is set to ignore the first name in the address book. You could also stay ahead of the bad guys by changing the name of the invalid email address.

Dull yellow jacket

Vincent Ho came up with a question that's been aired several times in this column. It's a perennial favourite but as it last surfaced over 18 months ago, let's have another look.



SCREENSHOT 3



SCREENSHOT 4



SCREENSHOT 5

Vincent thought it might be a good idea if the icon that you get when you create a new folder shortcut in Windows ME could be replaced with one that suits the user's personal taste, as the default one is rather plain.

'If you put it among other program icons on the desktop (like I did when I

Middle: First catch your image...

...then cut it down to size (bottom)

Stop worms from using your contacts

created a shortcut to one of my folders) it becomes immediately obvious that this new kid is underdressed. It would be wonderful if we could create our own designs using the Paint program which comes with Windows ME, and use them for folder icons.'

It seems a simple enough question, but it actually addresses several different issues, each of which leads to sub-issues.

Let's start with shortcuts. Personally I try to avoid creating anything other than temporary folders on my Desktop.

Anything permanent needing instant access I keep elsewhere, and have a shortcut to that folder on the Desktop.

This makes backing up data easier and lessens the strain on the drive where Windows is installed.

First let's look at how to create a shortcut to a folder. If you right-click on the Desktop, and choose New, Shortcut, you get a dialogue box asking for a Command line. If you know the location of the folder you want a shortcut to, then type it in, hit Next, accept or replace the name offered for the

shortcut and click Finish: the shortcut is then created. If, however, you can't remember the path to the folder, and hit the Browse button, you'll find there's a catch: if you try to pick a folder, it opens that folder in the browse window and you can only specify a file within the folder.

One way round this is to select any file in the target folder, and hit the Open button, which will take you back to the 'Create Shortcut' dialogue. The command line will appear filled in and you can edit it to remove the file name, just leaving the folder name.

An easier way is to use Explorer to navigate to the required folder, then drag the latter with the right mouse button on to the Desktop. Release the button and choose 'Create Shortcut here' from the pop-up menu. The shortcut will be created, and if you don't like the name, you can right-click and rename it.

All of this also applies to the Quick Launch bar – again, it's not a good idea to keep real folders in this, and you can either drag shortcuts straight on to it, or



SCREENSHOT 6

right-click on it and Open to see it in folder view, where you can use the 'New, Shortcut' method as well as drag and drop.

So you've got your shortcut, it's wearing that dull yellow jacket, and you want to change it. In fact if it's a Quick Launch shortcut and you don't have 'Show Text' enabled, this is something of a priority as, without labels, all folder shortcuts look the same. Right-click on the shortcut, choose 'Properties', then click on 'Change Icon'.

By default, you'll be offered the range of icons stored in the file C:\Windows\System\Shell32.dll. Many of these will be familiar, as this is the repository for the icons of the Windows shell, such as drives, the recycle bin and printers. If you don't find anything that takes your fancy, hit the Browse button – this will let you browse for any standalone ico file or those embedded in an exe or dll file.

This can be wearying, as most of the last two don't contain any icons. You might, however, have a look in C:\Windows\System\Pifmgr.dll, which contains some rather fine and

Your own efforts should be better than Windows'

Blaze away with Laser Tank

idiosyncratic examples, including an umbrella and an Ionic column. If you have Windows Desktop Themes installed, you will also find a wide variety of free-range icons in C:\Program Files\Plus!\Themes. Having selected your icon, OK out of both dialogues and the job is done.

If you still can't find an icon you like, there are thousands available on the web, as well as shareware and freeware icon editing programs. But this approach cops out of Vincent's wish to create his own designs in Paint, which brings us to a fine but hidden feature of Windows 95, 98 and ME.

If you set the 'Files of type' box in the Browse dialogue to 'All files', you'll find that you can point it at any bmp file and it will manufacture an icon out of that file. The bmp doesn't have to be any particular

screenshot 4 on previous page). Open the file in Paint, then go to Image, Attributes, and make a note of the size in pixels. Now go to Image, Stretch/Skew and work out what percentage you need to enter to reduce the shorter dimension to 32 pixels or just over: make sure you set the vertical and horizontal percentages the same or your image will be distorted – calculators are permitted.

Now View, Zoom, Custom, 800 per cent so you can see what you are doing: you can also View, Zoom, Show thumbnail to see how the icon looks in real size (see screenshot 5).

Now go back to Image, Attributes to set the pixel size to exactly 32 square: it will crop from the top left. If this isn't going to give you the right part of the image, then you can use the rectangular select tool to

If you are transforming an icon yourself, choose something simple

size – it will be scaled down to suit, and the original file isn't changed. But clever though this is, it can yield disappointing results, as, by the time a photo is scaled down to the standard 32pixel-square icon, it probably won't be very recognisable. You'll get better results if you either start from scratch or do the transforming yourself.

If you are doing the latter, choose something simple, such as a headshot against a plain background (see

pick the area you do want, then Edit and Copy To a new file. Having got your 32pixel-square picture, save the image as a 256-colour bmp file. You can then use the painting tools to create or modify it.

There's one other hot tip here. The top left pixel sets the transparent colour. If you pick this up with the dropper tool, any area you paint with that colour will become transparent when displayed as an icon (see screenshot 6).



SCREENSHOT 7

Bang bang

Windows would be intolerable without diversions, and this month I've found a good one. It's a logical puzzle game in which you move your eponymous Laser Tank around a board, using its gun to move blocks and disarm anti-tank guns in your quest to capture a flag (see screenshot 7). One feature is that you can undo any move so you don't have to start all over again if you die.

It comes with over 2,000 levels and the only payment author Jim Kindley asks for is that you use the built-in game editor to construct new levels for the Laser Tank playing community. Check it out at www.jccontrols.net/laser.

CONTACTS

Tim Nott welcomes your comments on the Windows column. You can contact him via the PCW editorial office or email: win@pcw.co.uk. Please do not send unsolicited file attachments.

INDUSTRY STANDARD COMPLIANCE IN A BOX

PlanIT

Health & Safety 3

PROFESSIONAL EDITION

“Under the Health and Safety at Work Act employers must have a written policy on health and safety at work which must be provided to all employees. Failure to provide such written information is an offence and carries a maximum fine of £20,000 in a Magistrates Court or an unlimited fine in the Crown Court.”



- ✓ Your Health & Safety plan in a box!
- ✓ Protect your staff, your business & yourself!
- ✓ Comply with all the latest regulations quickly and easily.
- ✓ Includes risk assessment module **REQUIRED BY LAW**
- ✓ Easy and quick to use.
- ✓ Plans for manufacturing, retailing and office.

- ✓ Creates a plan personalised to your business and its needs – commercial, industry or retail
- ✓ Quick and easy solution to the myriad of Health & Safety rules.
- ✓ A ten minute virtual consultation will create the plan to safeguard your business.
- ✓ Covers accident reporting & risk assessments
- ✓ COSHH (Control of Substances Hazardous to Health 1994 regulations)
- ✓ F2508 (injury or dangerous occurrence reporting)
- ✓ F2508a (report of a case of disease)
- ✓ Safety inspections and inspection recording

LENDING A HAND

PRICE LIST	No. personnel covered by the plan	RRP (Inc VAT)	No. personnel covered by the plan	RRP (Inc VAT)
	UP TO 5	£49.99	UP TO 100	£299.99
UP TO 10	£99.99	UP TO 250	£499.99	
UP TO 20	£149.99	UP TO 1000	£999.99	
UP TO 50	£199.99	OVER 1000	£1,499.99	

Not charging an arm and a leg!

System requirements MS Windows™ 98, MS Windows™ ME, MS Windows™ 2000, MS Windows™ XP. Requires an internet connection (software must be registered online before it can be used)

To order or more info
Online: www.planit.co.uk
Phone: 0870 010 6021
Fax: 0870 010 6025

Please Quote Ref: PCW2507

Ultimate Package

This Saturn XP2000+ package includes a powerful PC, superb 17" SVGA colour screen, Photo Printer and Digital Camera - all for just £679 +VAT.

The PC itself is based on the high performance Athlon XP 2000+ processor together with DDR motherboard and memory technology. It includes a massive 80GB hard disk, plenty of memory and both CD-Rw and DVD capabilities. It's also future-proof with built-in Ethernet for ADSL/broadband internet, vacant AGP slot and 4 USB ports.

Great Overall Performance

The Athlon XP2000+ together with DDR memory delivers far better performance than our Pentium 4 2000MHz PC.

Pentium 4 2000MHz

Athlon XP 2000+

Relative PC Performance

POWERED BY
DDR
MEMORY™

ADD A GT PACK
PAY NOTHING FOR 6 MONTHS

See Finance Example Below

GT Upgrade Pack

- Gamepad and Joystick
- Headset microphone
- Sun Star Office GT Suite (14 software packs, including full office suite and GSP publishing suite)
- 6 Top games including Quake III and Unreal Tournament
- Pay Nothing For 6 Months - see example below.



ONLY £99 +VAT = **£116^{.33}** inc VAT EXTRA
Code: 0999-030-00469

Saturn 2 XP2000+ PC

- AMD Athlon XP 2000+ Processor
- Seagate 80GB Hard Disk
- 256MB DDR PC2100 RAM memory
- CD-Rw CD-Rewriter/CD Copier Drive
- DVD-ROM Drive (combo)
- 17" SVGA colour screen
- 10/100 Ethernet built-in for ADSL/broadband internet router and networking
- Multimedia Power Keyboard system with "Hot keys"
- AGPx4 Savage S3 32MB graphics with vacant AGP slot for future expansion
- 3D wavetable stereo sound system and 1.44MB floppy drive
- Hayes 56K V92 Modem and supanet Internet Access
- Cyberlink Power Software Suite
- Logitech wheel mouse
- 4 x USB ports, Midi, Joystick, Serial, Parallel, Microphone, Modem and Audio ports.
- Microsoft Windows XP
- **Epson Printer** Epson C40 1440dpi photo quality printer
- **Digital Camera** Portable 3 in 1 digital camera

Saturn 2 Pro Model

As above, but includes the following upgrades:-

- 17" FLAT CRT Screen with maximum 1600 x 1200 resolution
- Epson C60 2440 dpi printer
- Subwoofer Speaker System with two satellites
- New high-spec. FashionCam Digital Camera - with built-in flash, 8MB memory and improved picture quality.

ONLY £99 +VAT = **£116^{.33}** inc VAT EXTRA
Code: 00588

TIME

www.timecomputers.com

ORDER DIRECT

0870 8303 101

Lines open: Monday to Friday 9.00am to 7pm
Saturday 9.00am to 5.00pm; Sunday 10.00am to 4.00pm

AMD ATHLON
XP2000+
PROCESSOR

PC2100
256MB
DDR RAM

SUPERFAST
80GB
HARD DISK

CD-RW
DRIVE

DVD-ROM
DRIVE
(COMBO)

BUILT-IN
ETHERNET
ADSL READY

INTERNET
MULTIMEDIA
KEYBOARD

**LIMITED
OFFER**



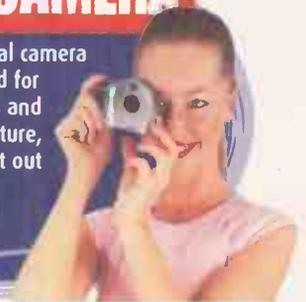
EPSON PRINTER

Stylus C40 1440 dpi
photo quality dual
cartridge printer -
limited to first
1000 orders



DIGITAL CAMERA

Portable 3 in 1 digital camera
which can also be used for
short video clip movies and
videophone. Take a picture,
load onto PC and print out
on the supplied
photo printer!



£679 +VAT

£797.83 inc VAT

Code: 00589

All prices shown are in UK £. Contact Dublin Store for Irish prices. Courier delivery £42.54 + VAT = £49.99. Finance available on models purchased with GT pack only. Example for CASH PRICE of £1000, no deposit, pay nothing for 6 months, then either pay just the CASH PRICE of £1000 or alternatively pay 42 monthly payments of £40.92 making total amount payable £1718.64. APR 29.8%. Credit subject to status. Written quotations on request. All models available via mail order only. Statutory cancellation rights apply to distance sales. Prices, specifications and offers are subject to change, availability and our conditions of sale, copies of which are available from Time Computers Ltd, Burnley, BB12 7TG. Fax 01282 77 07 01. www.timecomputers.com. Licensed credit brokers. E80E.

29.8%
APR
4 YRS

Time PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

Efficient partitioning

Fat 32 is inappropriate for large hard drives, but converting to NTFS is not simple, says Terence Green

Ian Park raised an interesting question on the subject of Fat versus NTFS drive formats. Having recently purchased a new PC preloaded with Windows 2000, Ian found that its entire 60GB hard disk had been formatted as a single Fat 32 partition. Such behaviour demonstrates a worrying lack of basic knowledge on the part of the manufacturer.

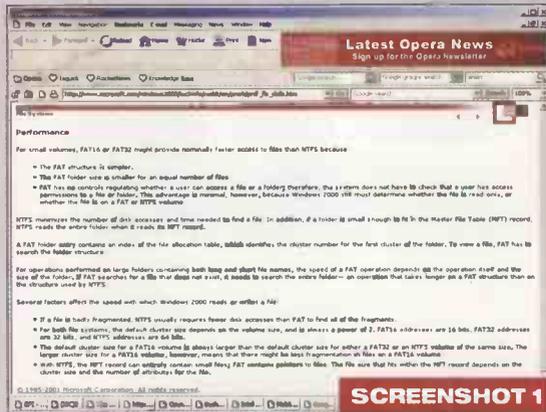
A simple search for 'Fat and NTFS' on www.microsoft.com soon reveals that Fat 32 partitions larger than 32GB result in extended boot times for Windows 2000 and a reduction in read/write speed. And that's the information for users; manufacturers receive far more detailed guidance.

Ian has two questions: 'I'm wary of having everything on such a big single partition and would I do better to switch over to using NTFS with Windows 2000? I seem to remember reading that Windows 2000 actually runs a bit faster in a Fat 32 partition than in an NTFS partition' (see screenshot 1).

While there is a general perception that Fat is faster, Microsoft's comparison of Fat and NTFS at www.microsoft.com/windows2000/techInfo/reskit/en/prork/prdf_fls_skdb.htm tells a different story. To this must be added the fact that Fat 32 partitions offer no real security and will almost certainly be more error-prone than NTFS. (From here on we use the term Fat to cover both Fat and Fat 32). NTFS autorecovers from numerous problems that would kill Fat, and has fine-grained access control permissions. Fat has no access control other than the read-only file attribute.

Cluster size is another little-known factor that may affect comparisons of Fat and NTFS. Windows 2000's Convert utility (See Help or type Convert/? at a command prompt to see what it does) will convert the 60GB C: drive to a 60GB NTFS drive. But, due to the way Convert works, it will set an NTFS cluster size of 512bytes regardless of the partition size.

File system documentation from Microsoft explains the implications in depth but, in short, a 512byte cluster size acts as a drag on performance. To see what cluster size your NTFS drives are using, run Disk Defragmenter, analyse the partition, and view the report (see screenshot 2).



SCREENSHOT 1

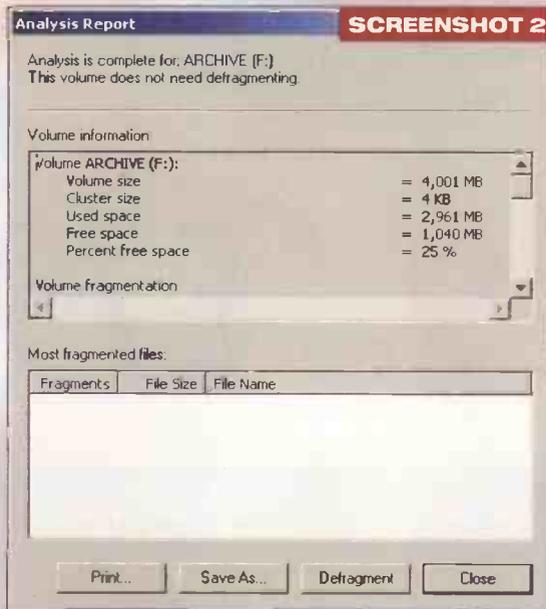
On small volumes, Fat 32 might provide nominally faster access than NTFS

Partitioning

There are only two ways to avoid 512byte sectors when switching from Fat to NTFS. Imaging the partition with Powerquest Drive Image or Norton Ghost is not one of them. Precisely because it is an image, regardless of the state of the target partition, the original Fat image will be restored as a Fat partition. The other drawback with converting a Boot partition from Fat to NTFS is that the security permissions will not be correctly set, because the original Fat file system does not support Windows 2000 security permissions.

Knowledgebase article Q237399 explains why, and details how to restore the default security settings. This article also explains a potential problem and how to work around it by installing a second instance of Windows 2000.

Disk Defragmenter's analysis reports the cluster size



SCREENSHOT 2

The two methods that avoid the above problems are: to perform a new (clean) Windows 2000 install, or format the target partition and copy (or restore from a backup) the information to it. A clean install lets you choose the file format (Fat or NTFS) but the cluster size will be automatically set according to the partition size.

A partition of between 1GB and 2GB (2,048MB) will have a 2KB (2,048bytes) cluster size; over 2GB the cluster size rises to 4KB. Knowledgebase article Q140365 lists the default cluster sizes that will be used if you don't override them.

The maximum you can select on Windows if using the GUI (eg Windows Explorer) to initiate a format is 4,096bytes (4KB clusters), but the Format command (in a Command Prompt window) allows you to choose cluster sizes up to 64KB. Third-party tools may also allow cluster sizes greater than 4KB. In general you don't want to do this, because compression and defragmentation tools won't touch Windows 2000 partitions with cluster sizes greater than 4KB.

This restriction includes third-party tools that use the Windows 2000 defragmentation API; ie all of them with the exception of Norton Speed Disk. Any NTFS drive over 1GB in size can safely be formatted with 4KB clusters.

If you decide on a clean install, you can partition the hard drive into several sections in order to separate data and operating system files. Windows 2000 doesn't have to go onto the C: drive – it can be installed to any logical drive. But, it does need to install a few small boot files on C: which can be NTFS-format unless you plan to install an operating system (eg Windows 98) or dual-boot system that needs C: to be a Fat-formatted.

Since you're starting from scratch, consider setting aside a small partition of 2GB on which to install a second instance of Windows 2000, as there are a number of disaster recovery scenarios where this can come in very useful.

Unclean options

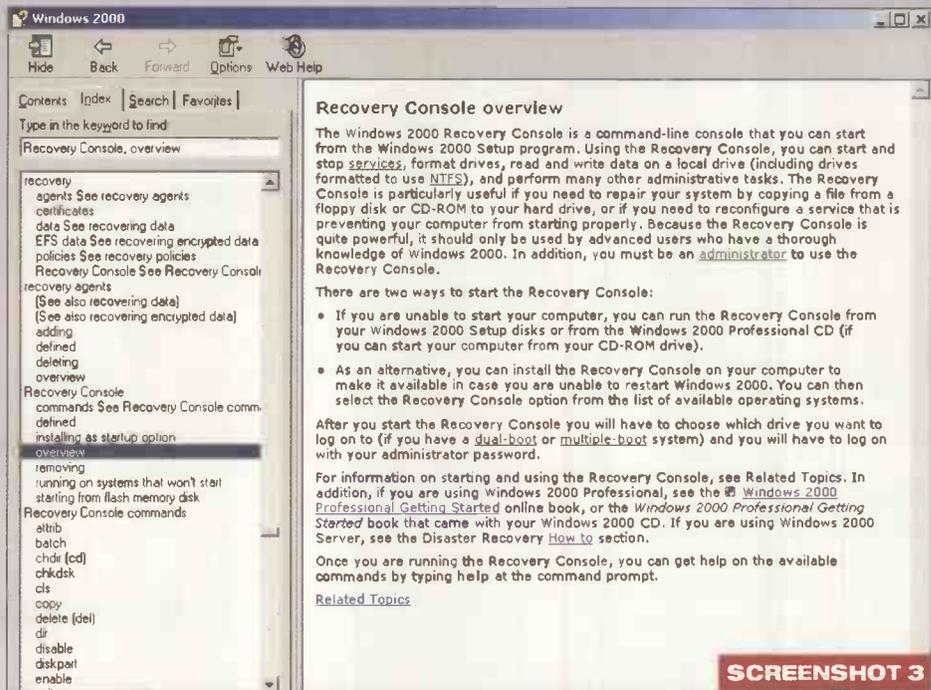
If a clean install isn't possible because you want to retain your existing setup and data, a copy or backup/restore is

an option. Either method is quite labour intensive and there are several gotchas.

First off, you can't copy or restore a Windows 2000 partition to a different drive letter – say from C: to D:. Well, you can but it won't work, because there are myriad absolute paths, such as C:\WINNT\..., stored in the Registry.

Second, unless you are using a backup utility that allows a full restore from Dos, you'll need to install a second instance of Windows 2000 in order to run the copy or restore option from there. An exception to this that you can adapt to your needs is detailed in Q249694 (How to move a Windows 2000 Installation to different hardware). Q249694 is worth reading even if you aren't going down this road.

Third, you can't copy a Windows 2000 installation in total if it's the one you booted into. You can get around this by booting into a different instance of Windows 2000, but in the scenario where Windows 2000 has been pre-installed on a large hard drive containing a single partition – as in Ian's case – you must first split the drive into two or more partitions with a utility such as Powerquest Partition Magic. Be sure to create a partition with enough space to hold the entire original Windows 2000 partition that you're upgrading from Fat to NTFS. Since drives are so large these



SCREENSHOT 3

Now use Windows Explorer to copy the entire original Windows 2000 to its temporary location. Then use Windows Explorer to format the original partition. Select a 4KB cluster size. If you see a warning message saying that you cannot format the drive, insert the boot floppy and reboot into the secondary instance of Windows 2000. It will boot from the

Boot into Recovery Console in order to fix the boot sector

this, boot with a Windows 2000 CD and follow the prompts to start the Recovery Console (see screenshot 3). When you get to the prompt, run the command Fixboot. The Recovery Console is documented in the Windows 2000 help file. If you can't boot from CD, use the instructions in Knowledgebase article Q197063 to create a set of four Windows 2000 Professional Setup floppy disks and run Recovery Console from them.

If you're unlucky enough to have bought a PC from a supplier that doesn't provide a proper Windows 2000 CD, try and borrow one or download the four disk images from DRDevice at www.drdevice.org/Index2.html (see screenshot 4).

It all seems over the top, and it is; Fat 32 is inappropriate for massive hard disks. Under these circumstances, preloading Windows 2000 so it sprawls over the entire hard drive knowing that Convert will produce limiting 512byte sectors and inadequate security is perverse.

Compounding the error as some manufacturers do by only including a recovery CD rather than the full product is doubly perverse, and limiting the recovery CD so it can only be used to restore to the entire hard disk rather than a more sensibly sized partition only adds insult to injury.

CONTACTS

Terence Green welcomes your comments on the Windows 2000 column. Contact him via the PCW editorial office or email: win2000@pcw.co.uk. Please do not send unsolicited file attachments.

There are two ways to avoid 512byte sectors when switching from Fat to NTFS

days it makes sense to create two extra partitions, one where you will install the second instance of Windows 2000 and another as a temporary store for the original Windows 2000.

Copying the files

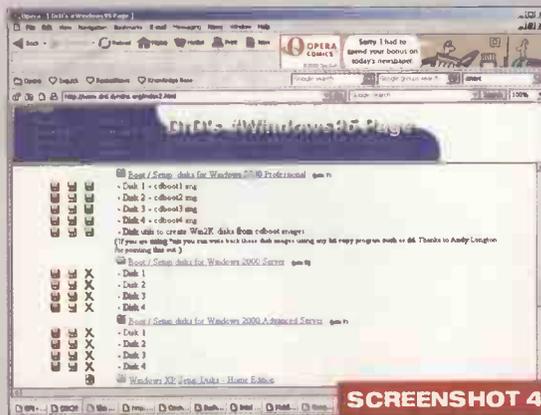
Install the second instance of Windows 2000 and boot into it as administrator. Now would be a good time to make a complete backup of the original Windows 2000 just in case.

Next (and this may be a crucial recovery aid if your original Windows 2000 is on the C: drive), create a Windows 2000 floppy boot disk by copying the boot files from C: to a blank, formatted, floppy. If necessary, use Windows Explorer/Tools/Folder Options/View to enable 'show all files' and 'show hidden files'. You need the ntldr, ntdetect.com, and boot.ini files. Depending on your hardware you may also have a ntbootdd.sys file. Copy that as well.

floppy instead of the hard drive and you'll be able to format the drive.

Having formatted the drive to NTFS you can now copy the original Windows 2000 back to its original location. If necessary you can copy the boot files from the floppy back to C:. If you have formatted the C: drive you will also need to update the partition data. To do

DRDevice: home of the village idiot's boot disks. Hmmm...



SCREENSHOT 4

Accelerate your start-up time

Roger Gann checks out Windows XP boot times, password protection and booting from a floppy

One of Microsoft's myriad design goals for Windows XP was to get it to boot and resume much faster than previous operating systems. In fact it set some targets for fast start-up time. On a typical consumer PC, Windows XP should boot to a usable state in a total of 30 seconds, resume from Hibernate (S4) in a total of 20 seconds or resume from Standby (S3) in a total of five seconds. Boot and resume times are measured from the time the power switch is pressed to being able to start a program from a desktop shortcut.

While start-up times are noticeably quicker with Windows XP, these guide times are seldom met in reality, as users install all sorts of other software that prolongs the boot process.

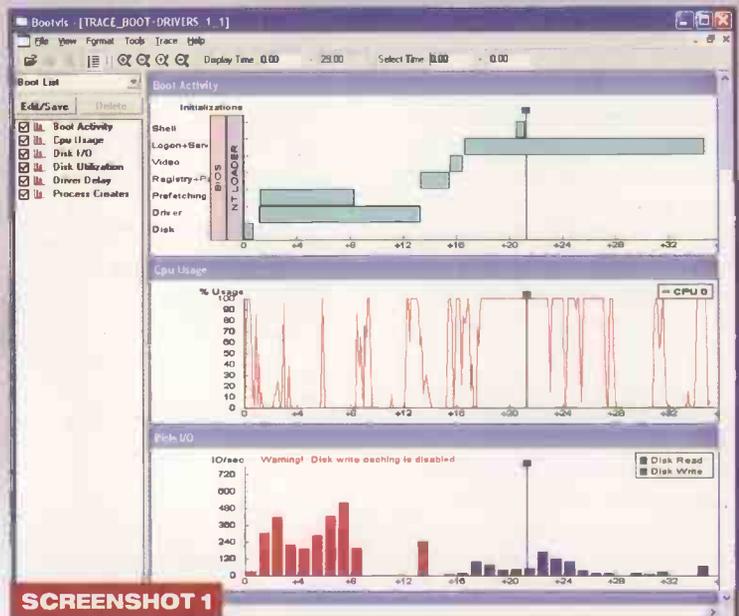
A good example of this is anti-virus programs, which are notorious in this respect. Until recently there was not a lot you could do to accelerate start-up times, but then in February along came a free utility called Bootvis, a 'performance trace visualisation tool' for use with Windows XP systems. A grand name, but put simply it displays a graphical analysis of which processes are doing what and when during boot. Armed with this data it can then automatically optimise your boot sequence for you (see screenshot 1).

Sounds good, eh? To download this 329KB executable, go to www.microsoft.com/hwdev/platform/performance/fastboot/default.asp where you'll find Bootvis.

Uncompress it and double-click on the resulting executable to run Bootvis. Now go to File, New and choose 'Next boot trace' or 'Next boot and drivers trace'. Leave everything else as it is and the system will reboot in about 15 seconds. Once the system is back up, wait a few seconds and Bootvis will reload automatically. Bootvis will now display five or six horizontal bar charts and graphs, covering things such as CPU utilisation and I/O activity during the boot process.

Alternatively, you can start a report by selecting Next Boot from the Trace menu, or select Next Boot + Driver Delays, which will show you if there are any drivers delaying your boot (they will be displayed in red). To get it to optimise your systems, click on Trace then

Bootvis can help you speed up Windows XP's already short start-up times



Optimize system. Once again the system will reboot. Again, once it has come back up don't touch anything and just wait. You'll see a thin message box 'Please wait for Bootvis to load'... This takes some time because the data files Bootvis generates can be some 30 to 40MB in size. While you can store the different sets of boot data, sadly Bootvis offers no facilities for comparisons.

About 20 seconds later another message box will appear: 'Optimising system for boot performance'. This is Bootvis going to town, rearranging your boot files for a faster start-up. This can take a few minutes, so be patient.

Help!

Although there's a help button on the menu, a help file isn't included with the program, so here's a brief explanation of its features. The top-most bar chart contains elements labelled Disk, Driver, Prefetching, Registry+Pagefile, Video, Logon+Services and Shell. If you hover your cursor over an item, it will give you the individual time each component took to load.

The Disk element tracks the time to enumerate all the devices in the non-pageable device path. This is everything from the CPU to the boot disk drive; multiple IDE devices and slow ones can affect this time. Typical disk time in Windows XP is two seconds.

The Driver element lists the time it takes to initialise devices. Prefetching

represents the time spent reading pages in from disk used later as devices initialise, and Winlogon, services, the shell and other applications start during boot. The Registry+Page file element comprises the time spent to read the Registry and initialise the page file.

The Video element tracks the time spent as the display mode is set for the final resolution and refresh rate. Video driver and Video Bios affect this time.

Last but not least, the Logon+Services and Shell component lists the times to start Winlogon, services, the shell, and so on. This is mostly the operating system. However, third-party software such as anti-virus and firewall software can affect this time. And the proof of the pudding? Well, of course, much depends on the software installed on each different PC and so your mileage may vary, but I obtained some modest improvements having run Bootvis.

According to its own logs, the Boot Done time was reduced from 24.1 to 21.3 seconds, a 12 per cent gain. Using my own timings, which included the time until the Desktop went 'quiet', the overall boot time shrank from 76 to 63 seconds – a 17 per cent gain. OK, nothing to rave about but as Bootvis is buckshee you can't complain too much, can you? As they say in the supermarket ads, 'every little helps'.

Passwords

First of all a salutary warning for all users of Windows XP Home Edition – check your

Administrator password. For reasons best known to itself, Microsoft has seen fit to have a blank password as default for the Administrator account.

As any fool knows, in order to gain complete control of a machine all you have to do is log in as Administrator, hit Return and then set up your own password, thus preventing the bona fide Administrator from gaining full access to that PC (see screenshot 2).

I've heard of a school network that's been compromised in this manner and the disruption that such an oversight can cause really doesn't bear thinking about – for if the real password can't be obtained (which would allow it to be changed to something else), there's a very real prospect of needing to reinstall Windows XP, though you could use brute-force password crackers at a pinch, I suppose.

So, don't say you haven't been warned – lose that blank Administrator's password right now and replace it with a proper password.

Having said that, there are plenty of situations where you're the only person to use a Windows XP PC and the password protection can get a bit OTT. But how do you go about losing the password? Simple: select Run... from the Start menu and type:

control userpasswords2

which will open the User Accounts application. On the Users tab, clear the box for 'Users Must Enter A User Name And Password To Use This Computer', and click on OK. An Automatically Log On dialogue box will appear; enter the user name and password for the account you want to use.

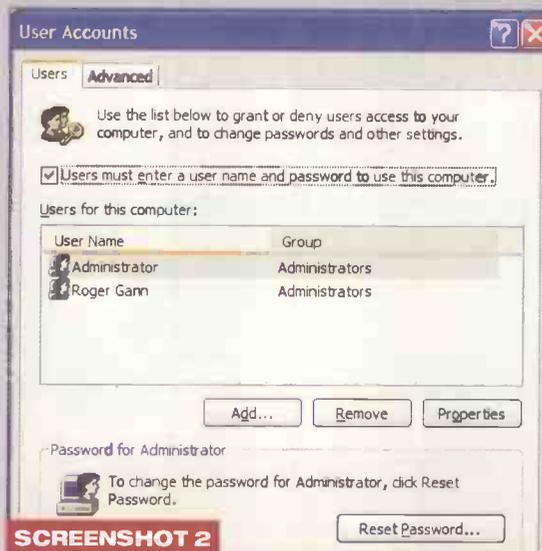
Next, click on Start and open the Control Panel. Double-click on the User Accounts applet and click 'Change the way users log on or off'. Clear the check box for 'Use the Welcome Screen' and the check box for 'Use Fast User Switching'. Click 'Apply'

Temporary house cleaning

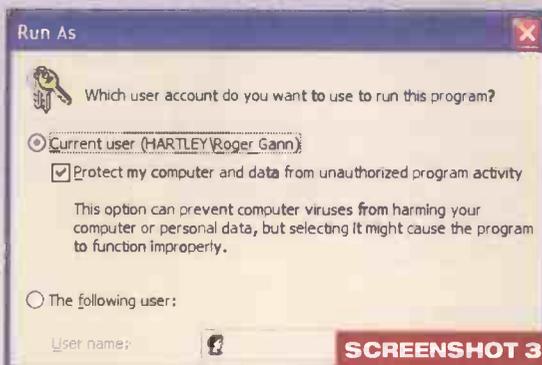
Although you shouldn't really have to do it, it seems that it does pay to spring clean your system every now and again – it can make a real difference to the behaviour of certain programs.

I'm thinking mainly of Internet Explorer. Not only can clearing out Temporary Internet Files improve browsing speeds, but reducing the maximum size of the folder containing these files can also cure unexpected IE behaviour.

Have you been having trouble saving browser graphics, where right-clicking only lets you save in bmp and not the



SCREENSHOT 2



SCREENSHOT 3

native jpg format the image is probably in? There have been reports that reducing the size of the browser cache to something like 50-100MB as opposed to the default of five per cent of disk space fixes this.

I did it anyway – I didn't want 650MB of my hard disk space devoted to this sort of data. These settings are in the Tools, Internet Options menu. You can also use the Disk Cleanup wizard to rid yourself of clutter. You'll be astounded at how much Junk is on your Windows XP machine.

This wizard won't look at the Prefetch folder, however. Prefetch is a feature unique to Windows XP. Put simply, it creates a system directory called the Prefetch folder and then fills it with 'precached' data (data it knows it will need) that's used when you start the system. This is part of the reason boot times in XP are faster than Windows 2000 – it's getting data intelligently for the boot cycle based on previous boot cycles.

Over time, though, the Prefetch folder (which is located in the Windows folder) can be cluttered with irrelevant data. It can often help to empty the contents of the Prefetch folder from time to time. Don't worry about this – the folder will be intelligently refilled by the system every time you reboot.

Top: It's vital to give the Administrator account a password – before somebody else does

Bottom: If some programs don't run properly as a limited user, try using the 'Run As' trick

Booting from a floppy

Although you can indeed create a system floppy under Windows XP, the OS it installs on that disk is essentially MS-Dos 7, or that included with Windows 9x. This is fine if your system uses the Fat 32 file system but less than helpful if you use the far superior NTFS. Supposing your main hard disk conks out? How can you access it to fix it? Well, the short answer is that you can't, not without resorting to some third-party drivers. The only way forward is to boot from the Windows XP CD-Rom and enter the Recovery Console. If you've never done this, you might want to check it out. It's worth a look because it's pretty powerful. It might also get you out of a tight corner. I'll be looking at this useful tool in a future column.

The good news is that there's now a second option for people whose PCs can't boot CDs or those who don't have Windows XP CDs, ie those with 'pre-installs'. You used to be able to create bootable floppies direct from the Windows NT and 2000 CD-Roms by deft use of a command switch, but this option is absent from the XP CD-Rom.

Instead you can now download them from the Microsoft website – you'll find this facility at <http://support.microsoft.com/default.aspx?scid=kb;en-us;Q310994&ID=310994>. Or search for document Q310994. This utility will spawn no less than six floppies, so not surprisingly it adds up to a 4.4MB download.

Tips corner

I get more than my fair share of readers reporting that some software won't work properly for 'limited users' but works fine for 'Administrators'. Clearly the obvious solution is to temporarily promote the limited user to an Administrator, install the software then demote them back to a limited user – cruel but fair.

In fact there's quicker alternative to this slightly long-winded approach, and that's to use the 'Run As' option (see screenshot 3). You can run a program as a different user without logging out and back in again. Right-click the icon, select Run As... and enter the user name (eg Administrator) and password you want to use. This 'promotion' only applies for that 'run' and so doesn't affect any users.

CONTACTS

Roger Gann welcomes your comments on the Windows XP column. Contact him via the PCW editorial office or email: xp@pcw.co.uk. Please do not send unsolicited file attachments.

A chip off the old block

Barry Shilliday surveys the state of Unix on Intel and explains how to set up Internet keyboards

Unix on the PC, or more specifically on the Intel platform, has gone through a fair amount of change over the past few years. It wasn't long ago that companies including Sun Microsystems and SCO were pushing their commercial Unix systems, while dismissing Linux as a toy for spotty teenagers or computer science students (or in some cases both).

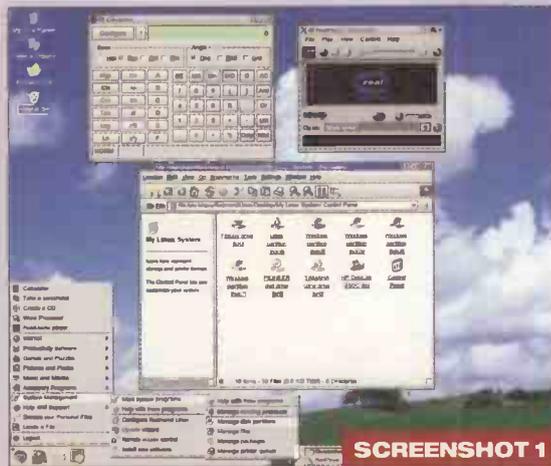
More recently Sun has effectively discontinued support for Solaris on Intel by not releasing the new Solaris 9 version for anything other than its own Sparc hardware. SCO has been consumed by Caldera, embracing Linux as a key platform.

Other vendors, especially IBM, have been desperately waving the 'We love Linux' banner. IBM last year even got into a bit of trouble for literally painting the streets in San Francisco, promoting its dedication to the new operating system (www.cnn.com/2001/TECH/Industry/04/19/ibm.guerilla.ltdg).

This has left the Intel world devoid of proprietary Unix. What remains now is Linux and the BSD flavours: OpenBSD, NetBSD and FreeBSD. All of these are open-source systems. Even Apple's new Mac OS X, although it doesn't run on Intel hardware, has an open-source Unix kernel known as Darwin. It's no surprise that all the major software vendors, excluding Microsoft, are keen to be 'open-source friendly' and some even appear to be doing some very positive work. IBM has an excellent resource site found at www.ibm.com/developerworks/linux, which includes tutorials, Interviews and downloadable software.

A side effect of the Linux boom is the growth in the number of distributions. Not so long ago there was Slackware and Red Hat and not a lot else. There are now no fewer than 250 or so different distributions (www.lwn.net/distributions).

There are about seven major distributions – Caldera, Red Hat, Debian, Suse, Mandrake, Slackware and



Left: Lycoris' Desktop/LX KDE desktop... presumably the name Desktop/XP was already taken

Install. This is in stark contrast to major distributions that may have well over 1,000 different applications that can be chosen – dependencies allowing. Desktop/LX also only installs one desktop, KDE, and one application of each type. For example, a typical major distribution will provide maybe five FTP clients and CD players; Desktop/LX has just one of each. The lack of hands-on control that Desktop/LX gives may appeal to new users, if not others (see screenshot 2).

There are some drawbacks to the distribution, mostly for people who've used Unix systems in the past. The missing utilities and applications you might be used to can be frustrating, although these can be installed at a later date – Desktop/LX uses the RPM system for software management.

There are some minor problems that would be obvious to an experienced Unix user but not to a beginner – for instance, if you try to eject a CD and a shell is open in the CD's directory, the GUI gives no feedback and the CD remains firmly unejected.

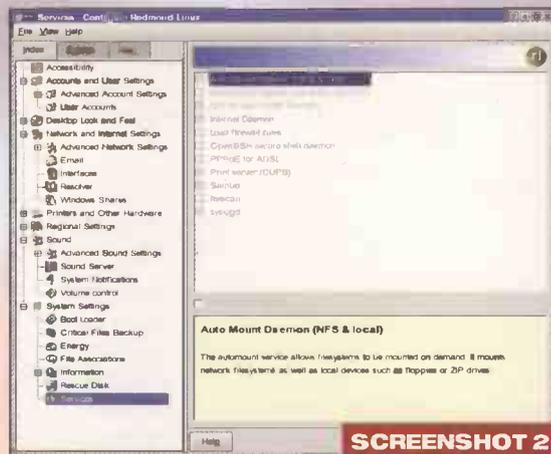
The installation, however, is one of the best around. It silently and correctly detects sound cards, CD writers, graphics cards and so forth and presents an intelligent X configuration screen with common resolutions. The package installation gets under way in the background while you are given a game of patience to play while you wait.

Lycoris' website is found at www.lycoris.com and Desktop/LX is available in Europe from The Little Linux Factory (www.linuxfactory.ie).

Keyboard configurations

Last month we looked at the poor quality support of the euro symbol across the major Linux distributions. One change made to the X configuration allowed the euro symbol to be entered by using the 'Alt-Gr 4' keyboard combination. This month we'll see how this fix works, and how to add some sort of functionality to the extra keys found on a lot of newer 'Internet' keyboards.

The latest releases of the XFree86 (or X11) system use the 'XKeyboard'



Desktop/LX's KDE control panel. This version of the distribution is often referred to by its previous name, Redmond Linux

Turbolinux – all of which have been established a while. One distribution that is beginning to move itself from the horde of minor distributions to major is Lycoris Corp's Desktop/LX (see screenshot 1).

Formerly Redmond

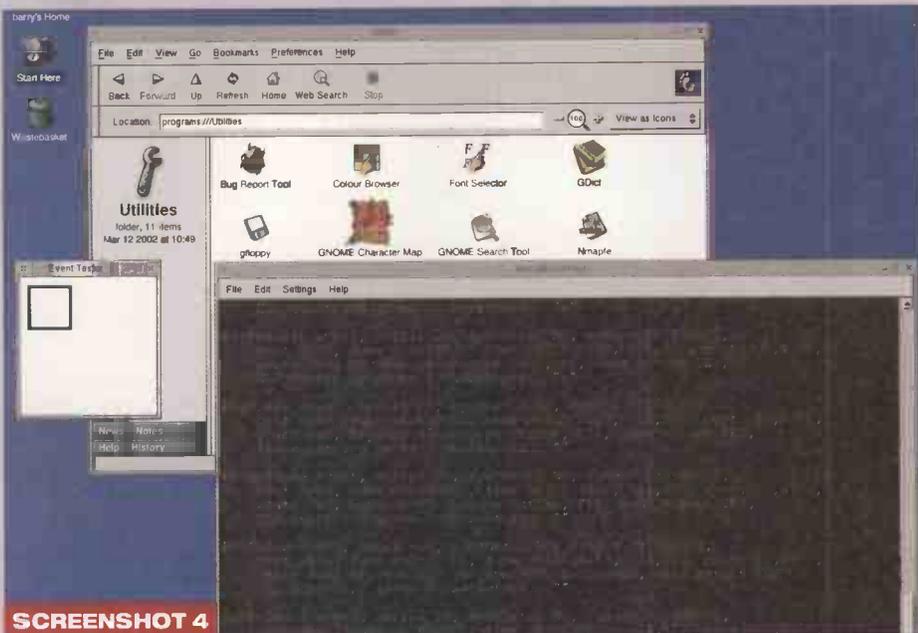
Desktop/LX was until recently known as Redmond Linux, and provides a system familiar to Microsoft Windows users. Its aim is to provide a friendly desktop with a look and feel similar to Windows XP. As a desktop-orientated distribution, the standard version does not come with any development tools, or some of the common server applications found in all the major distributions, although there is a Deluxe edition that includes some development software. This isn't necessarily a negative: new users can be put off Linux and Unix in general by the sheer number of applications.

A surprising feature of the Lycoris distribution is that during installation you cannot select the software you want to

X11 CONFIGURATION

FIG 1

Option	"XkbRules"	"xfree86"
Option	"XkbModel"	"pc105"
Option	"XkbLayout"	"gb"



SCREENSHOT 4

<FK01>, and in the symbol files it is set to the F1 symbol. In this example no character is generated, as the F1 symbol (like Page Up or a cursor key), has no associated character.

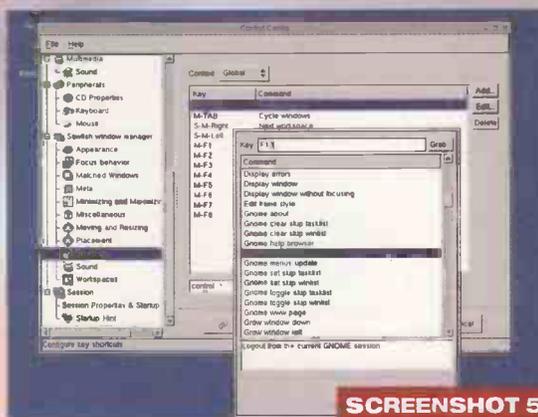
The two final events are from the 'Sleep' key on my Internet keyboard. By using xev, we can now find out the keycode of this non-standard key (223) and we can see that it currently does nothing – it hasn't been defined in the symbols file. On examining the XFree86 keycodes file (`/usr/X11R6/lib/X11/xbk/keycodes/xfree86`), we see something similar to that shown in figure 3.

FIG 4

MICROSOFT KEYCODES

Keycodes for a Microsoft Internet keyboard

Back	234
Forward	233
Stop	232
Refresh	231
Search	229
Favourites	230
Web/Home	178
Mail	236
Mute	160
Vol-	174
Vol+	176
Play/Pause	162
Stop	164
PrevTrack	144
NextTrack	153
Media	237
MyComputer	235
Calculator	161
Sleep	223



SCREENSHOT 5

Reassigning basic actions in Gnome is easy, even to keys that wouldn't normally exist!

To add some functionality to the sleep key, just add the necessary lines to the gb symbols file (`/usr/X11R6/lib/X11/xbk/symbols/gb`) as shown similarly in screenshot 3. For example:

```
key <15F> [ [ F13, currency ],
           [ dead_acute, dead_grave ] ];
```

This configures the Sleep key to give an F13 as standard, and a euro (currency) symbol when pressed together with Shift. The two remaining definitions are generated when pressed with Alt-Gr and Shift & Alt-Gr respectively. These symbols are interesting in that they give nothing themselves and are known as 'dead keys'. Dead keys affect the key pressed immediately afterwards, so pressing Alt-Gr+Sleep followed by an e will provide an e-acute (é) character.

Each additional key can be configured like this. Figure 4 shows a list of the keycodes for the extra keys on a Microsoft Internet keyboard.

Any changes to the symbols files are lost when you upgrade or re-install

Left: xev spurring out event information. Behind it is Nautilus running on Red Hat Linux

XFree86. It may be worth creating a separate file for significant changes. Copy the gb symbol file to another file, such as gb_i, and modify the XkbLayout entry in your XF86Config file to use this new name.

Assigning actions to keys is somewhat more complicated since it involves configuring the window manager (for example KDE or Gnome's Sawfish) to interpret the key and act upon it. A few simple tasks are easy to configure, however, and making the Sleep key log out of Gnome is one possibility. All that needs to be done here is to enter the Gnome control centre and go into the Global Shortcuts section of Sawfish Configuration. As shown by screenshot 5, the 'Gnome logout' action can be assigned to F13. After applying this change the key, sure enough, activates the logout window.

Less than the GPL

In the April issue, I talked about the differences between the two main types of open-source licences; the GPL and BSD licences. Steve Crook (steve@scholl.demon.co.uk) has emailed to draw attention to the existence of the LGPL, or Lesser GNU Public Licence. As the name suggests, this is a less restrictive version of the standard GPL, and it falls under the BSD-style category of licences.

The LGPL is commonly applied to shared system libraries – it was in fact originally known as the 'Library GPL'. A straightforward example is the omnipresent GNU C library. Almost every program on a Linux system uses this library, and because the GPL licence ensures that all programs using GPL'd code are also placed under the GPL, many people would seek alternatives, especially those writing proprietary code.

The GNU C library, along with the majority of others, is therefore released under the LGPL, allowing programs to use the code without it affecting their licences. The net result is that the libraries are used everywhere, they remain open source, and just about everybody stays happy.

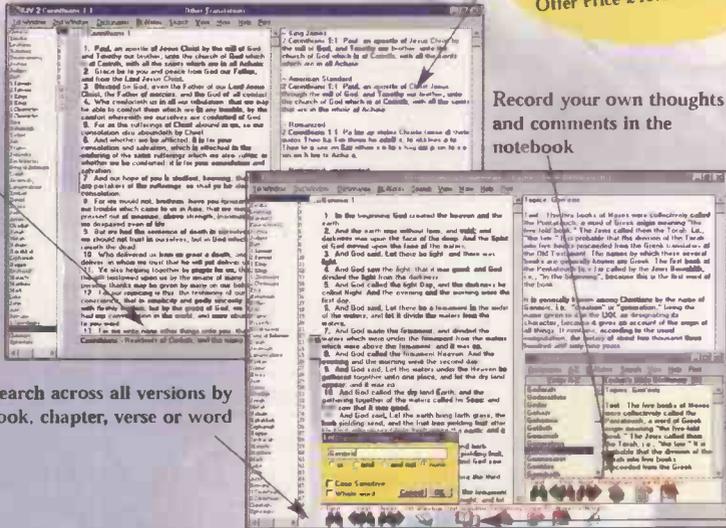
CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Contact him via the PCW editorial office or email: unix@pcw.co.uk. Please do not send unsolicited file attachments.

THE BIBLE Library

Use the 'Quick Dictionary' to understand words and phrases

Compare multiple bibles on one screen



Search across all versions by book, chapter, verse or word

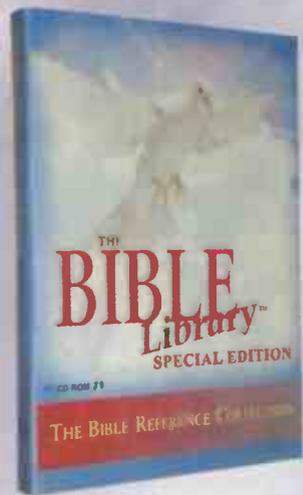
The Bible Library SE RRP £29.99
Offer Price £19.99 Save £10

The Bible Library Deluxe RRP £79.99
Offer Price £49.99 Save £30

Record your own thoughts and comments in the notebook

Copy, print, export and save any passage

THE BIBLE REFERENCE COLLECTION



Imagine the power of having so many complete Bibles (all cross referenced), two Bible dictionaries, together with commentaries, concordances, references, topical studies, hints and tips all at your fingertips. The Bible Library makes it possible. *Truly discover the Bible!*

The powerful search facility means you can find words, verses, chapters and books making your research easy. And with The Bible Library's full cross-referencing tools you can compare multiple bibles simultaneously and easily access word studies, commentaries, historical works and more.

With something to enlighten everyone from parents and children to students and the clergy - The Bible Library is the ideal way to bring the wisdom of the Bible into your home.

Take advantage of our introductory offer and **SAVE!**

Order now on **0870 010 6029**

www.biblelibrary.co.uk
or complete the coupon

Lines are open 9:00am - 5:30pm 7 days a week. Please be ready with your credit card, delivery address, statement address or complete the coupon

RECEIVING YOUR SOFTWARE

No matter how large or small your order we have a simple, single postage packing insurance and delivery price of £3.95 (includes VAT). Please allow up to ten days for delivery, subject to availability. Overseas readers please call for a delivery quotation.

Please tick this box if you do NOT wish to receive offers from Lexington Warner & Associates Limited and approved companies.

System Requirements: Windows ME/2000/98/95 and CD ROM drive

	SE	Deluxe
Bibles	4	18
American Standard Version	1	1
Darby Translation	1	1
King James Version	1	1
Living Bible	1	1
Morris Literal Translation of Hebrew & Greek with Strong's #	0	1
Transliterated Bible: Pronounceable	0	1
Transliterated Bible: Unaccented	0	1
Webster's Bible	0	1
Weymouth's NT	0	1
International English © Bible NT (Simple English Bible)	0	1
Latin Vulgate	0	1
Living Bible	0	1
New Jerusalem Bible with Apocrypha (Imprimatur)	0	1
New King James Bible	0	1
New Revised Standard Version	0	1
Revised Standard Version	0	1
Spanish RVA (1981 Baptist Spanish Publishing House)	0	1
Young's Literal Translation	0	1
Word Studies	0	4
Strong's Greek Dictionary	0	1
Strong's Hebrew Dictionary	0	1
Strong's Numbers Linked to Morris Literal Translation & Word Studies	0	1
Harris Theological Wordbook Old Testament 2 Volumes	0	1
Commentaries	2	4
Easton's Book Synopsis	1	1
Henry's Commentary on Whole Bible	0	1
Morris Introduction to Bible Books	1	1
Gray's Bible Study Commentary	0	1
Cross References & Concordances	6	9
Citation to full verse toggles for each Bible	1	1
Concordances of each Bible & each Reference	2	2
Linked Bibles, Commentaries, Dictionaries & Word Studies	1	1
Morris Chain Reference System	1	1
Parallel Linked Multiple Bibles on one convenient screen	1	1
Ellis Englishman's Concordances OT & NT for each Bible Version	0	2
1 Million Cross References / Treasury Scripture Knowledge	0	1
Dictionaries, References, History, Helps	12	18
Bamford Bible Dictionary	1	1
Bookmarks	1	1
Boolean Plus Multiple Bible Division Searches	2	2
Easton's Bible Dictionary	1	1
Notebook or Use Your Own Wordprocessor	2	2
Personal notes linked to verses	1	1
Tutorial, Tips, Helps	3	3
Edersheim's Life and Times of Jesus the Messiah	0	1
Edersheim's The Temple	0	1
Eiwell's Evangelical Dictionary of Theology	0	1
Hitchcock's Bible Names Dictionary	1	1
International Standard Bible Encyclopedia 4 volumes	0	1
Josephus, Complete Works 8 Volumes	0	1
Wetzel's Bible Chronology	0	1
Topical Studies	2	11
Nave's Topical Bible (Plus a Naves for each Bible Version)	2	2
Osbeck 101 Hymn Stories	0	1
Ritchie Sermon Outlines: 500 Bible Truths, 500 Children's 500 Christian Life, 500 Evangelistic, 500 Gospel	0	5
Ritchie 500 Gospel Sermon Illustrations	0	1
Ritchie Outlines citation to full verse toggles for each Bible Version	0	1
Torrey's Topical Textbook	0	1
Bible Maps	0	33
Companion Texts to Bible Maps	0	12
3 Bible Games	0	3
TOTALS:	26	112
Plus 1,000 Ellis Christian ClipArt images		
Bible Stories, Church Activities & Symbols	0	1,000

MR, MRS, MS INITIALS SURNAME

ADDRESS

POSTCODE

DAY TEL NO.

E-MAIL

B101	BIBLE SE	RRP £29.99	£19.99	QTY	£
B102	BIBLE DELUXE	RRP £79.99	£49.99	QTY	£

Please Quote Ref: PCW2507 DELIVERY CHARGE **£2.95**

TOTAL

I enclose a cheque/postal order, made payable to Lexington Warner & Associates OR please debit my credit card

Visa
 Mastercard
 Switch
 AMEX

Expiry date / / Start date / / Switch Issue No. / /

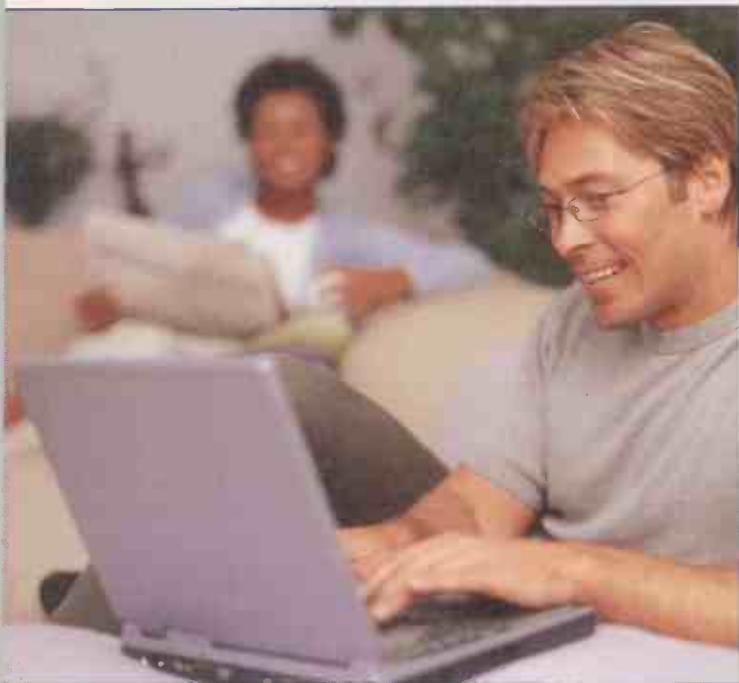
Extra card security (not Switch) Flip your card and write the last 3 numbers printed on the strip, in the boxes.

Number

Signature

Post to Bible Library, FREEPOST (LE6536) Barwell, Leicester, LE9 7BZ or fax on 0870 010 6039.

Portable Power



The Time Traveller A4-1500 Notebook is the most powerful 15.1" genuine 'mobile' processor based notebook you can buy for **£899+vat.**

Why settle for a 14.1" screen when you can have one of the best displays possible on a notebook with a crisp, sharp, large, 15.1" TFT XGA screen? Take a closer look at the amazing specification that includes built-in CD-Rw and DVD drive and amazingly fast Athlon 4 1500 mobile processor with plenty of memory, hard disk storage and all the ports and expansion capability you will ever need!

This amazing notebook is sure to be in massive demand. Please order early to reserve yours.

Relative Notebook Performance

This notebook outperforms our Pentium 4 1800MHz based notebook.

Pentium 4 1800MHz

Athlon 4 1500 Mobile

PowerNow! Mobile Technology

Unlike some notebooks that use desktop Pentium 4 processors (not recommended by the processor manufacturer), this notebook uses a genuine mobile processor and incorporates PowerNow! technology to enhance battery life.

Time Traveller A4-1500 CD-R 15.1"

- 15.1" TFT XGA (1024 x 768) screen
- AMD Athlon 4-1500 genuine 'mobile' processor
- 256MB PC133 SDRAM Memory (expandable to 640MB)
- 30GB Hard Disk (Fujitsu or Toshiba)
- CD-Rw CD-Rewriter/CD-copier Drive
- DVD-ROM Drive (combo)
- PowerNow! system to enhance battery life
- 56K V90 modem and supanet internet access
- Built-in 10/100 Ethernet (RJ45) for ADSL router and networking
- 32MB AGP x 4 graphics and 3D wavetable sound
- Built-in 3.5" floppy drive
- 5 x Easy start and 1 dedicated 'mail receive' buttons
- TV-out port for large screen presentations
- Li-ion Long life 8 cell battery and A/C adaptor/charger
- Built-in microphone and twin stereo speakers plus ports for external speakers, microphone and analogue/digital Line Out devices
- Parallel printer, external SVGA, Infra Red IRDA, external PS/2, Serial, 2x USB ports and 2 PC Slots - 2 type 2, 1 type 3 (with 32 bit card bus and zoomed video support)
- Advanced keyboard and 2 button track pad
- Power DVD video software and CD 'burn' software
- Microsoft Windows XP
- 3.4Kg 310 x 265 x 40mm

Traveller 1600

As above, but with:-

- AMD Athlon 4 1600 Processor
- 384MB PC133 SRAM Memory
- 40GB Hard Disk

£999 +VAT = **£1173.83** inc VAT
Code: 0415-030-00585



www.timecomputers.com

ORDER DIRECT

0870 8303 101

Lines open: Monday to Friday 9.00am to 7pm
Saturday 9.00am to 5.00pm; Sunday 10.00am to 4.00pm

XGA
15.1"
TFT SCREEN

CD-RW
DRIVE

ATHLON 4
1500
MOBILE

DVD-ROM
DRIVE
(COMBO)

256MB
SDRAM

BUILT-IN
ETHERNET
ADSL READY

30GB
MOBILE
HARD DISK

TV-OUT
DUAL SCREEN
SUPPORT



Featuring...

AMD PowerNow!
TECHNOLOGY

£899

+VAT

£1056.³³

inc VAT

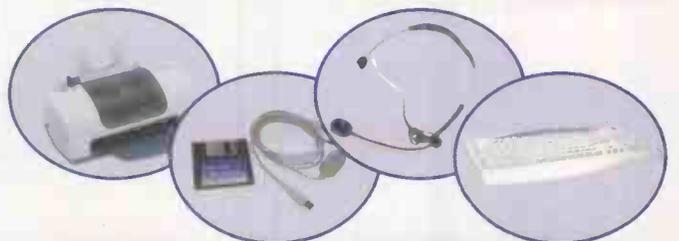
Code: 0415-030-00584

UPGRADE TO HOME/OFFICE PACK
PAY NOTHING FOR 6 MONTHS

See Finance Example Below

Home/Office Pack

- Epson C40 1440 dpi photo quality printer
- Full size multimedia keyboard for use at home or in the office
- Laplink and Cable
- Headset Microphone
- Dragon Speech and Dictation pack
- Sun Star Office GT Suite (14 software packs)



ONLY £99 +VAT = **£116.³³** inc VAT EXTRA

Code: 0999-030-00466

All prices shown are in UK £. Contact Dublin Store for Irish prices. Courier delivery £42.54 + VAT = £49.99. Finance available on models purchased with office pack only. Example for CASH PRICE of £1000, no deposit, pay nothing for 6 months, then either pay just the CASH PRICE of £1000 or alternatively pay 42 monthly payments of £40.92 making total amount payable £1718.64. APR 29.8%. Credit subject to status. Written quotations on request. All models available via mail order only. Statutory cancellation rights apply to distance sales. Prices, specifications and offers are subject to change, availability and our conditions of sale, copies of which are available from Time Computers Ltd, Burnley, BB12 7TG. Fax 01282 77 07 01. www.timecomputers.com. Licensed credit brokers. E&OE.

29.8%
APR
4 YRS

Time PCs use genuine Microsoft® Windows® www.Microsoft.com/piracy/howtotell

TMNB(07)07

Rage against the machine

Gordon Laing finds the obscure cause of a crashing problem and sorts out Bios and dual-boot problems

Call me paranoid, but sometimes I really feel my PC has turned against me. It's not subtle either: it'll be fine for weeks, then all of a sudden it will just start crashing for some extraordinarily obscure reason. Before you say 'I told you so', I'm not talking about my tweaking systems that regularly find themselves over- or even under-clocked. I'm referring to my main work PC, which I try to keep as clean and untweaked as possible.

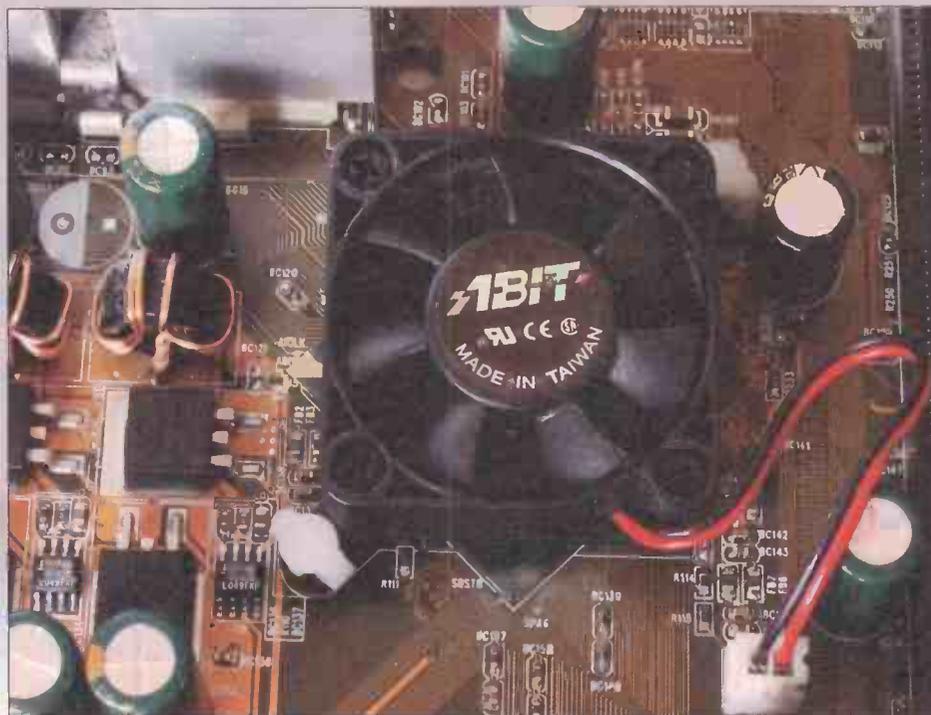
The problem was that my PC would suddenly freeze after between five and 30 minutes of use, requiring a hard reset followed by the usual patronising wrist-slapping of Scandisk. I have a dual-boot machine, so I started up in my other operating system, but found it suffered from exactly the same problem. Obviously, it was a hardware issue; I set about the trial-and-error process of removing and replacing various components.

It's not until you do this that you realise exactly how many things are in your PC that could have gone wrong. This time round I started by swapping the memory Dimms as, believe it or not, a faulty Dimm was responsible for identical symptoms on an earlier system. Fortunately, my Dimms checked out, as did the CPU, heatsink, graphics, disks and a plethora of cards. I must admit I was running out of options.

Then one day I had the side of my case removed and happened to notice something amiss. I have an Abit KT7A-Raid motherboard in my main system and this features a small fan on the northbridge portion of the Via chipset (see picture above). There's nothing unusual with this, although I have to admit to being sceptical about their necessity in a relatively basic PC.

I've used active chipset coolers before, but only on heavily overclocked or dual-CPU systems, and generally believed a basic passive heatsink is more than sufficient for normal systems. The thing is, with the side of my case temporarily removed, I noticed that the chipset fan intermittently stopped spinning and, guess what, once it was inactive for any length of time, my PC froze again.

Powered down, I cleaned some dust out of the chipset fan and ensured it was spinning when I next switched on.



If your PC starts freezing, remember to check the fan on the chipset – it's more important than you may have thought

Surprise, surprise, the PC didn't freeze. To confirm my suspicions, I unplugged the chipset fan and recreated the system freezing. The really annoying thing was that I had previously checked the fans inside my system and they were all working fine – the one on the chipset was actually waiting to fail until I had closed the case or stopped looking.

So that was my problem solved and a lesson learnt. The chipset fan really was performing an important task on this relatively modest and very much untweaked system. I'll certainly be looking out for this should similar problems occur in the future, and hope that as chipsets become more demanding, their temperature is accurately monitored in the same way as the main CPU, and not just estimated as an overall motherboard temperature – that way at least we'll have some clue as to what has gone amiss.

Dual CPUs and ADSL

As a postscript, I should add that during these problems, I switched to an old dual-Pentium III system as a backup and found that it, too, started crashing regularly. This time, though, the problem was tracked down to my Alcatel USB ADSL modem, which had never been connected to this PC. It turns out that the drivers for this USB modem are

incompatible with dual-CPU systems, and cause them to freeze intermittently! I downloaded a fix, but it didn't make any difference on my system.

This was going to be a problem, because my new main machine was also going to feature dual CPUs. Last month I built a dual-Athlon system using an Asus A7M266-D motherboard and a pair of Athlon XP 1800+ chips, and obviously wanted it to work with my ADSL connection.

Despite being told the contrary by some engineers, it is in fact possible to use any ADSL modem with an ADSL line – it's just that your ISP may not officially support it or help you with the configuration. I wanted an Ethernet ADSL modem that could also share my broadband connection between my PCs, so I opted for a D-Link DSL-504 (pictured on the opposite page). This is an ADSL modem with a router, firewall and four 10/100 switched Ethernet ports – yours for a bargain £150 ex VAT.

I unplugged the Alcatel USB modem and connected the D-Link DSL-504. After configuring it via a web browser, I could connect to the Internet immediately without installing drivers or bothering with any of that tedious dial-up networking. The router and switch facilities also allowed me to share the

broadband between all my PCs and quickly network them together. And, crucially for me, the Ethernet connection didn't cause any problems with my dual-CPU systems.

When my current ADSL contract expires, I'm going to swap to one of the recently announced DIY options that requires you to provide your own ADSL modem. Fortunately, my D-Link router will do the job, and only costs about £50 more than the entry-level Alcatel USB model.

I would recommend that anyone thinking of sharing ADSL between multiple PCs goes for an Ethernet-based router such as the DSL-504 instead of messing around with a USB modem and Windows' Internet Connection Sharing (ICS). Believe me, it works much better. The only reason you'd want to use the USB ADSL modem is if you need to save a few quid or absolutely do not want to fit an Ethernet card in your PC.

Tricky Bios

I'm not the only one who's suffering from obscure PC problems. Gareth Jenkins wrote several months back, posing the popular question of how to upgrade his old Slot 1 motherboard with a modern FC-PGA (Flip-Chip Pin Grid Array) Intel CPU and socket converter. I was, however, surprised to learn Gareth's problems were not to do with tracking down an elusive socket, but with updating his Bios.

Gareth has an Asus P2B, which must be running the latest version 1012 of the Bios to take a socket upgrade; trouble was that Gareth's was stuck on version 1007. It was refusing to be flashed to the latest version for some reason.



After scratching my head for a while, Gareth solved the problem for himself by heading over to the Flashbios site at www.flashbios.org. Run by Arthur Kerkmeester in the Netherlands, Flashbios offers a service that does exactly what it says on the tin: either reprogramming Bios chips that have gone wrong or supplying brand new Bios chips with the exact software you're after.

This is invaluable for anyone who's flashed their Bios with the wrong software and not been able to recover it, or for Bios chips that for some reason won't accept new software. It's quite a hardcore process that involves you physically removing your Bios chip (pictured below), then sending it to Flashbios with a cash payment and instructions on precisely which software you'd like it to be programmed with. Flashbios will then either reprogram it for £5, or supply a completely new chip for £20; both prices include postage.

D-Link's DSL-504 Ethernet ADSL modem can be used to share your broadband connection between PCs

Sending hard cash to the Netherlands with your Bios chip may seem like a leap of faith, but it worked for Gareth and numerous desperate others whose references are on the website; Flashbios normally seems to be able to return the required chip in around one week. Gareth went for a new chip with the version 1012 software and now enjoys running an 800MHz Celeron in his system, which previously housed a 333MHz CPU; he did also have to increase the socket voltage from the recommended 1.75v to 1.8v to get it working though.

Finally, there's a great utility called CTbios that you can download from this website, which provides detailed information about your motherboard and Bios. This is incredibly useful for anyone who needs to know the manufacturer, model or version of their motherboard and Bios, but didn't know where to look. On the downside, the current version is in German, but the required system information is easy to spot.

Powerleap P2B Bios fix

Several months ago, US-based Powerleap released a new socket adaptor that could take the very latest Tualatin Celeron and Pentium III processors. This gives old Slot 1 motherboards an even greater lease of life, but with two caveats: first, Powerleap only sells its PL-iP3/T adaptor with a new Intel CPU already attached, and second, it didn't work on the popular Asus P2B motherboard.

I'm now pleased to report that Powerleap has written a customised Bios for the Asus P2B that allows it to work with its Tualatin adaptor. Powerleap charges an extra \$10 (£6.66) for this Bios on top of the \$149 for the adaptor and a 1.2GHz Tualatin Celeron; postage, import tax and VAT are extra.

The Bios fix also only supports the basic Asus P2B and P2B-F motherboards, not any other models in the P2B family – Powerleap is constantly testing different



Has your Bios chip given up the ghost? Get it reprogrammed!

configurations and motherboards though, so check on its website for the latest information. Go to www.powerleap.com and click on the Pentium II, Pentium III or Slot 1 Celeron links.

Secure dual-boot

Gregory Pym emailed with an interesting question concerning dual-boot systems. He likes to keep his Windows installation as clean as possible, but his kids love downloading software. The solution is, of course, to have a dual-boot system, with one partition for him and one for his kids, but he's justifiably concerned about one partition being able to see the other. Ideally he'd like to have a dual-boot system where the two Windows installations are entirely separate and cannot see each other's files.

My first idea was to employ the fact that different operating systems can only use certain file systems. For instance, Windows 98 can only use Fat 16 and Fat 32 file systems and simply cannot see any other type. Windows 2000 and XP can also use Fat 16 and Fat 32, but additionally support NTFS. Consequently you could install Windows 98 on a Fat 32 partition, and Windows 2000 or XP on an NTFS partition. The Windows 2000 or XP partition would be able to see the Fat 32 Windows 98 partition, but not vice versa. Hence the kids can boot into Windows 98 and play to their heart's content without ever getting near Gregory's NTFS partition.

I put this to Gregory and he replied that he would prefer to use Windows 98 on both partitions, as he and his kids were keen on the best games performance. Even if he did go for the Windows 2000/98 route there was still a potential situation where his kids could boot his NTFS partition by mistake and start using that instead. Since Gregory had two hard disks, he wondered if there was an easy way to put separate Windows installations on each and use some kind of electrical switch allowing only one to be powered up at a time.

After toying with the idea of internal electrical power switches, I came to my senses and remembered removable hard disk caddies. These are simply small trays into which you fit a hard disk. The tray then slides into a cradle fitted in the PC, which itself is connected to the internal disk

IDE hard disk caddies and cradles are sold together from £10 to £50 and beyond, depending on quality

ASUS ACCESSORIES

Motherboard manufacturers are acutely aware that there's often not a great deal to differentiate their products from a competitor's.

Consequently, the board designers rack their brains for a feature that makes them stand out in the crowd. Recent innovations have included Abit's much copied Softmenu, Gigabyte's dual-Bios and Asus' Ipanel. Having recently switched to an Asus motherboard in my main PC, I decided to check out the Ipanel.

The Asus Ipanel is a simple but very useful accessory that works with the vast majority



Ipanel provides useful diagnostics and handy ports for Asus motherboard owners

of recent Asus motherboards, pretty much from the CUSL onwards (sadly the P2B is too old). Supporting motherboards will have a row of 24 pins labelled AFpanel and a reference in their manual; an Ipanel entry in the I/O Device Configuration in the Bios should be also enabled.

The Ipanel comes in basic and deluxe versions costing around £20 and £30 each. They slip into a free 5.25in

front-mounted drive bay and connect to various headers on the motherboard. Both models offer software-configured hotkeys, a pair of front-mounted USB ports and an LED display which can toggle between clock frequencies and temperatures along with showing diagnostics on startup. The deluxe model additionally offers a front-mounted 9pin serial port, Irda module and audio jacks.

controller and power. They're traditionally used for easily removing and swapping SCSI hard disks in big Raid arrays.

Fortunately for Gregory and a wealth of other PC enthusiasts, hard disk caddies are available for standard IDE interfaces. All you do is insert the main cradle into a spare 5.25in drive bay in your PC and connect a power and IDE cable to the back as if it were a normal drive. The actual 3.5in hard disk is fitted into the caddy, which itself has very short data and power cables. The caddy can then be slotted into the cradle and work as normal, or be removed for security or easy data transportation.

You could have cradles in two PCs, allowing both to share the same removable hard disk and easily transport data. Alternatively you could have one cradle in your PC, and give each user their own hard disk in a caddy or simply use multiple disks to try out different operating systems. This is clearly the best solution for Gregory, as he can buy a caddy for each of his hard disks, and only ever have one connected to the PC at a time. His two Windows installations would therefore be kept completely separate. In this situation, both disks would be set as

the master of their IDE channel, as only one will ever be connected at a time.

IDE hard disk caddies and cradles are sold together from £10 all the way to £50 and beyond, depending on quality. Searching Google for hard disk caddies or cradles comes up with many options – check out the Hard Disk accessories section of Kustom PCs at www.kustompcs.co.uk. Alternatively you should find plenty on sale at your local computer fair.

There are several things to look out for though. Most important of all, ensure there is some kind of locking mechanism that prevents a disk from being inserted or removed while the power is on, as this could permanently damage your disk and motherboard. Second, many cradles have fans fitted, which can be handy for keeping a disk cool. Finally, check out the cabling inside the caddy and cradle itself, as to support UltraDMA66, 100 or 133, it will need to employ the 80-wire higher density ribbon cable. If it uses an older-style 40-wire cable, then the bandwidth on that channel will be limited to UltraDMA33, or 33Mbytes/sec.

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Contact him via the PCW editorial office or email: hardware@pcw.co.uk. Please do not send unsolicited file attachments.

Morgan

WAREHOUSE SURPLUS OUTLET
BRANCHES IN LONDON, BIRMINGHAM & MANCHESTER

MAIL ORDER SALES
0870 120 4940



INTERNET

www.morgancomputers.co.uk
Latest offers - updated regularly

BUSINESS HOURS

Monday-Friday 9.00am-5.30pm
Saturday 9.00am-5.00pm

Subject to availability, prices subj to change, E&OE. Goods not supplied on a trial basis.

ALL STOCK BRAND NEW UNLESS STATED

LONDON

64-72 New Oxford Street
London WC1A 1AX
Tel 020 7255 2115
Fax 020 7436 6285

GREENFORD

Unit 25 Derby Road
Metropolitan Ctr UB6 8UJ
Tel 020 8575 0055
Fax 020 8575 7985

BIRMINGHAM

34 Edgbaston Centre, Hagley
Road, Birmingham B16 8SH
Tel 0121 452 1141
Fax 0121 455 6855

MANCHESTER

Unit 11-12 Station Approach
Manchester M1 2GH
Tel 0161 237 1111
Fax 0161 237 3146

FAMOUS BRAND

ALM TOP PC

Weights 167g
CD mono screen
Backlit display
Palm OS 3.1



Ultra slim handheld PC, 2Mb RAM (upgradeable to 10Mb), touch screen / USB input, PC & Mac compatible, USB cradle/charger, uses Palm OS 3.1H & includes organiser, calc etc.

£49⁹⁹ EX £58⁷⁴ inc VAT

FUJI FINEPIX 2200

2.1 MEGAPIXEL CAMERA

1600 x 1200 dpi
Fully automatic
TFT screen
Uses SmartMedia



Fuji FinePix 2200, 2.1 Megapixel CCD, max 1600 x 1200 dpi resolution, 2.5x digital telephoto mode, LCD colour screen, optical viewfinder, built-in flash. As new stock - 1 year warranty.

£99⁹⁹ EX £117⁴⁹ inc VAT

IBM THINKPAD 600E

WITH DVD-ROM DRIVE

Pentium II 366
128Mb RAM
6Gb hard drive
TFT screen



With Intel Pentium II 366MHz chip, 6Gb hard drive, 128Mb RAM, DVD drive, 13.3" TFT colour screen, Li-Ion battery, 56K/V.90 internal modem. Ex-lease stock no op/sys or drivers.

£449⁹⁹ EX £528⁷⁴ inc VAT

HP PAVILION 7934

HP STOCK ROTATION

Intel P4 chip
CD-RW drive
30Gb hard drive
128Mb RAM



Intel P4 1.8GHz chip, 128Mb SDRAM, 30Gb hard drive, 12x 8x 32x CD-RW drive, Nvidia 32Mb AGP graphics, Win XP Home Ed, Works 2001 & more. Full range of monitors in stock.

£599⁹⁹ EX £704⁹⁹ inc VAT

COLOUR INKJET

CANON HIGH RES PRINTER

1440 x 720 dpi
9 ppm mono
4 ppm colour
Parallel & USB



Canon S400 colour inkjet printer, max 1440 x 720 dpi print res, 9 ppm mono 4 ppm colour printing, USB & parallel port interfaces. As new refurb stock - inc new ink carts & 1 year warranty.

£39⁹⁹ EX £46⁹⁹ inc VAT

2Gb PCMCIA DRIVE

TOSHIBA 2Gb PC CARD

2Gb capacity
Robust design
Pocket sized
RP £299.99



Toshiba 2Gb PCMCIA storage card, ideal for transferring large amounts of data between PC's/data back-up, will fit most notebooks with a Type II card slot. Supplied in protective case.

£69⁹⁹ EX £82²⁴ inc VAT

CANON SCANNERS

GRADE A CANON REFURBS

USB Connection
Full 1 year
RTB warranty



CanoScan 670U: 600 x 1200 dpi res, 42 Bit colour, flatbed design, z-lid.

£34⁹⁹ EX £41¹¹ inc VAT

CanoScan 1240U: 2400 x 1200 dpi, 42 Bit colour, flatbed design, z-lid.

£79⁹⁹ EX £93⁹⁹ inc VAT

FILM SCANNER

11 MEGAPIXEL RES

Fast scan times
2820 dpi res
SCSI i/face
APS option



Minolta Dimage Scan Speed film scanner, scans negs & slides onto your PC, 11 megapixel scan res, 30 sec average scan time. Inc SCSI cable, TWAIN driver & imaging software.

£249⁹⁹ EX £293⁷⁴ inc VAT

TOSHIBA 430 CDT

SUPERB 11.3" TFT SCREEN

Pentium 120 chip
32Mb RAM
1.2Gb hard drive
CD-ROM drive



With Intel Pentium 120MHz chip, 1.2Gb hard drive, 32Mb RAM, internal CD-ROM, external 1.44Mb floppy drive, 11.3" TFT colour screen. Ex-lease stock no op/sys or drivers.

£199⁹⁹ EX £234⁹⁹ inc VAT

OLYMPUS 2000 ZOOM

2.1 MEGAPIXEL CAMERA

Optical zoom
TFT screen
Fully automatic
1600 x 1200 dpi



C-2000 Zoom, 2.1 Megapixel CCD, max 1600 x 1200 dpi res, 3x optical zoom lens, LCD colour screen, optical viewfinder, Shutter/Aperture priority & Program modes. As new - 1 year wty.

£149⁹⁹ EX £176²⁴ inc VAT

FUJI FINEPIX 1300

3 MEGAPIXEL CAMERA

280 x 960 dpi
TFT screen
Digital zoom
Autofocus



Fuji FinePix 1300 1.3 megapixel digital camera, 1.5" TFT screen, 2x digital telephoto mode, optical viewfinder, USB connection to PC. As new refurb, all cables etc - 1 year warranty.

£79⁹⁹ EX £93⁹⁹ inc VAT

HP PAVILION 7919

HP STOCK ROTATION

16x DVD drive
30Gb drive
128Mb RAM
56K modem



AMD Duron 900 chip, 128Mb SDRAM, 30Gb hard drive, 16x DVD drive, S3 Savage4 AGP graphics, MS Win Me, Works 2001 & more. Full range of monitors in stock - please call

£379⁹⁹ EX £446⁴⁹ inc VAT

PRINTER & SCANNER

CANON IMAGING BUNDLE

Colour printer
1200 x 2400 dpi
Flatbed Scanner
600 x 1200 dpi



S300 colour printer, 1200 x 2400 dpi print res, 11 ppm mono, 7.5 ppm colour. D646U scanner, A4 flatbed design, 600 x 1200 dpi, USB interface. As new refurb stock - 1 year warranty.

£79⁹⁹ EX £93⁹⁹ inc VAT

TOSHIBA NOTEBOOK STOCK CLEARANCE

HUGE RANGE OF MODELS

- Direct from Toshiba - as new, graded & ex-demo notebooks.
- Models include: Satellites, Satellite Pros, Tecras & Porteges.
- Toshiba warranty on all models



Please call for stocks or visit our website at:

www.morgancomputers.co.uk

SUB £50 LASER!

PPM LASER PRINTER

300 x 600 dpi
16Mb RAM
50 sheet tray
Free hopper



HP 9208 - 8 page/min office printer, 600 x 600 dpi res, 2Mb RAM - max 18Mb, 250 sheet tray - free paper hopper (holds 250 extra sheets). 2nd and stock - toner life not guaranteed.

£49⁹⁹ EX £58⁷⁴ inc VAT

DELL CP PII 366

LARGE 13.3" TFT SCREEN

Pentium II 366
128Mb RAM
6Gb hard drive
CD-ROM drive



With Intel Pentium II 366MHz chip, 6Gb hard drive, 128Mb RAM, internal CD-ROM, 13.3" TFT colour screen, supplied with battery & carry case. Top notch refurb no o/s or drivers.

£449⁹⁹ EX £528⁷⁴ inc VAT

OLYMPUS C-1

1.3 MEGAPIXEL CAMERA

1280 x 960 dpi
TFT screen
Digital zoom
Autofocus



Olympus C-1 1.3 megapixel digital camera, 1.5" TFT screen, 2x digital zoom. As new refurb, 1 year warranty. Olympus C-2 2 Megapixel digital camera - **£129.99** (£152.74 inc VAT)

£89⁹⁹ EX £105⁷⁴ inc VAT

E MACHINES 366

366MHz chip
32Mb RAM
3.2Gb hard drive
56K modem



E Machines base unit with Cyrix 366 processor, 32Mb SDRAM, 3.2Gb hard drive, integrated 56K fax modem, US keyboard (easy UK setup), mouse. No op/sys - includes device drivers.

£149⁹⁹ EX £176²⁴ inc VAT

BT INKJET FAX

PAPERJET SERIES

Catalogue returns
Brand new ink
cartridge



Paperjet 100: 20 page memory, stores 40 names/numbers, on-hook dialing.

£69⁹⁹ EX £82²⁴ inc VAT

Paperjet 200: Integrated answerphone, 20 page memory, copy function.

£99⁹⁹ EX £117⁴⁹ inc VAT

DVD/CD-RW DRIVE

TOSHIBA COMBO DRIVE

4x 24x CD-RW
4x DVD read
12.5" drive
TAPI i/f



Toshiba SD-R1002 DVD/CD-RW combo drive, compatible with all industry standard CD/DVD formats, ideal data backup device, ATAPI i/face. Brand new OEM stock - bare drives.

£59⁹⁹ EX £70⁴⁹ inc VAT

PORTEGE 7020

12.1" TFT & 128Mb RAM

Pentium II 366
128Mb RAM
6Gb hard drive
Ultra-slim



With Intel Pentium II 366MHz chip, 6Gb hard drive, 128Mb RAM, PCMCIA CD-ROM, 12.1" TFT colour screen, 56K modem. Ex-lease refurb stock, no operating system or drivers inc.

£499⁹⁹ EX £587⁴⁹ inc VAT

COMPUPRINT 16PPM

16PPM OFFICE LASER

600 x 600 dpi
16 page/min
4Mb RAM
500 sheet tray



2400 x 600 dpi res (image enhanced), 550 sheet paper feeder, 4Mb RAM (max 68Mb), parallel port & serial port connections, PCL6 emulation. Brand new stock full 1 year warranty.

£169⁹⁹ EX £199⁷⁴ inc VAT

MORGAN GIANT ILLUSTRATED PRICELIST

DON'T MISS OUT!
THE MORGAN FLYER
FREE EVERY MONTH

Giant illustrated monthly price list packed full of all the latest surplus, end of line and closeout computer hardware and software deals.

CALL 0870 120 4940
FAX 0121 456 5564



Sum like it hot

Tim Nott manipulates some numbers in Word tables and modifies the word count feature

As we've seen in the past, Word tables are a wonderful aid to formatting a document, doing practically everything that tabs can do and much more. Apart from the obvious lining up of columns and rows of text or figures, we've recently looked at creating letterheads with left and right-aligned text or graphics, printing text landscape on a page with portrait headers and footers, producing labels and creating concordances.

In fact there's so much you can do with tables that there's a danger of getting overenthusiastic – when your favourite tool is a hammer, everything starts to look like a nail.

Word tables are no substitute for a spreadsheet, especially as most people with a copy of Word will either have Excel or the Microsoft Works Suite spreadsheet. However, basic number manipulation can be achieved in Word tables.

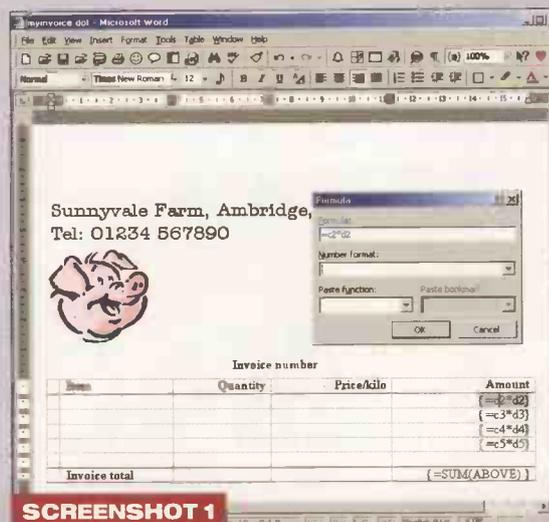
You may have been mystified by Clive Pygott's query in this month's Question Time. What is this {=sum(above)} stuff? Well, combining field codes and tables lets you reference one or more table cells from another, and manipulate their contents.

To take a simple example, let's say you want to produce an invoice using your usual letterhead. First create a new template, either based on a blank document or your existing letterhead.

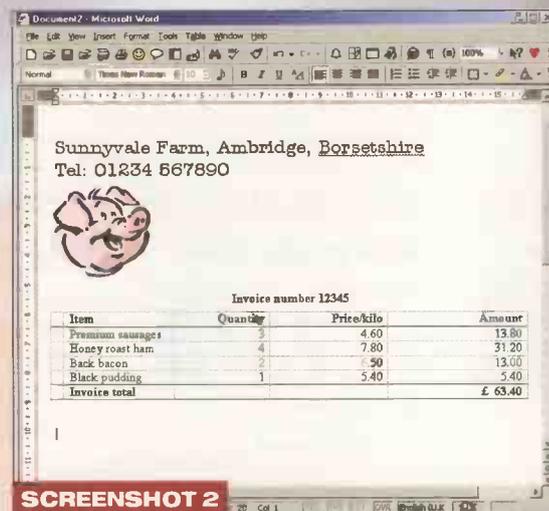
Next create your table and give it suitable headings, as I've done in screenshot 1. Then you need to enter some formulae. Put the cursor in the cell where you want the formula – in this case the rightmost cell on the second row, and go to Table, Formula, Dialog. You want to multiply the quantity by the unit price so in the formula box type in =c2*d2. This is similar to what you would do in a spreadsheet: the columns are referenced as a,b,c... and the rows as 1,2,3...

Normally you'd also include a Number Format, which is added to the field, but I've left this out to make the screenshot clearer. Repeat for the other item rows: note that there's no equivalent of the Excel Fill feature that can repeat a formula with cell references updated, so you have to do this all by hand.

Finally, in the bottom-right cell enter the formula =sum(above). You must either use the Table, Formula dialogue, the



SCREENSHOT 1



SCREENSHOT 2

Top: Setting up the template

Above: Word does the arithmetic

Insert, Field dialogue, or if you're really in a hurry Control & F9 to get an empty field: you can't just type in curly brackets from the keyboard. Having saved the template, create a new document based on it: you can keep the template open as you may well want to modify it.

Now it's time to populate the invoice, so type some suitable items, quantities and prices into the new document. Having done that, make sure View Field codes is off, as you want to see the results. Select the entire document (Control & A) and press F9: this will update all the fields and you should see something like screenshot 2.

Notice that I've cheated and added in the Number formats. I've also deleted the empty next-to-last row. The =sum(above) formula is very picky. In fact, in the case of blank cells

immediately above the =sum(above) it seems to work properly in Word 2000, but a blank cell in the middle of a column results in only the cells below the blank being summed. Putting a zero in the blank cell fixes the problem.

Although I've shown a very simple example, you can use all Word's field codes in tables – so you could, for example, make a cell's contents conditional on the state of another by using an IF field.

Out for the count

One feature of Word I use a lot is the word count. I've assigned it to a button on the main toolbar, and also to the right-click edit menu, where it's particularly useful for counting the words in a selection.

Word 2002 (XP) has a toolbar specifically for this, but going on the basis that you can't have enough of a good thing, here's a macro that I found on the Microsoft Office website. This puts the word count up on the title bar – I've modified the original slightly as it also showed the number of characters and paragraphs, which doesn't really add value as far as I'm concerned.

Sub showcount()

```
With ActiveDocument.
ActiveWindow
.Caption =
.Document.Name & " - " &
.Document.BuiltIn
DocumentProperties(wd
PropertyWords) & " Words "
End With
End Sub
```

(Key: ✓ code string continues)

This has the advantage that it works in Word 2000 as well and, unlike the XP toolbar, doesn't take up any screen space other than the toolbar button you assign it to. It isn't dynamic – but then nor is the XP toolbar – so you need to hit the button or shortcut key you've assigned to update it. And as mine has just come up with the target count for the column, that's it for this month.

CONTACTS

Tim Nott welcomes your comments on the Word Processing column. Contact him via the PCW editorial office or email: wp@pcw.co.uk. Please do not send unsolicited file attachments.

Scheduling meetings and naming files

Stephen Wells shows you how to get organised, and offers some tips on renaming documents

Long-time reader of this column, Bill Alexander, has volunteered a far more flexible answer to a problem discussed in the March column. An Excel user had asked how to figure the dates of his voluntary organisation's meetings, which fall on the second Wednesday of every month.

The beauty of Bill's solution is that you can quickly change the day of the week, or position in the month.

First enter the values 1 to 12 in the range A5:A16. These represent the months of the year. In B5 enter:

```
=DATE($B$1,A5,$K$2*7)-  
MOD(WEEKDAY(DATE($B$1,  
A5,$K$2*7))-(K$1-7),7)
```

(Key: *↵* code string continues)

then drag this down to cell B16.

In Cell B1 enter the year of your choice, such as 2002. In cell K1 enter the day of your choice as a number, 1 to 7: Sunday being 1, Wednesday being 4 and so on. In cell K2 enter 1 for the first Wednesday, or other day, in the month; 2 for the second, and so on. If you want to keep the programming solution simple, that's it.

However, if you would like to make this application even more user friendly you could well go further and add dropdown choices as in screenshot 1. Spell out the days of the week in cells I1 to I7, and the numbers 1 to 7 in the range J1:J7. Highlight this range I1 to J7 and, using Insert, Name, Define, give it the Name, Days. In the range I9:I13 enter 1st, 2nd, and so on. In the range J9:J13 enter the numbers 1 to 5. Highlight the range J9 to J13 and Name it Weeks. Choose View, Toolbars, Forms.

	A	B	C	D	E
1	In Year	2002	meetings will be held		
2	on the	2nd	Wednesday	of each month.	
3					
4	The dates are as follows				
5		9/1/2002			
6		13/2/2002			
7		13/3/2002			
8		10/4/2002			
9		8/5/2002			
10		12/6/2002			
11		10/7/2002			
12		14/8/2002			
13		11/9/2002			
14		9/10/2002			
15		13/11/2002			
16		11/12/2002			

SCREENSHOT 1

Hover the mouse on the tools to display their names. Select the Combo Box tool. Draw a box over cell B2. Right-click and choose Format Control.

In the new dialogue box enter Weeks for the Input range; K2 as the Cell link; and 5 for the number of Dropdown lines. The first time you use the dropdown arrow you'll see the choice available of 1st, 2nd and so on. Draw another Combo Box, this time over cell C2 – you'll probably have to make column C wider. For this box the Input range is Days; the Cell link is K1; and the number of Dropdown lines is 7.

Fill in the surrounding text as shown in screenshot 1. The user doesn't need to see the numbers of the months in column A, so format the font colour to match the background colour – White for White or, as here, Pale Blue.

When the user picks a day in C2, or the monthly position in B2, the link cell will automatically change and consequently the dates beneath will display correctly.

Calculating the dates of meetings held on any particular day in the month

Picking up a file name

Paul Thompson asks: 'Is it possible to save a worksheet with the file name determined from cell info within the worksheet? I import a report file from the manufacturing database in the factory where I work and need to save a copy.'

About a year ago, regular reader Chris Page offered an effective short macro that does this and it's worth repeating. The listing assumes that the file name is in cell A1 but obviously you can specify any cell you like. You can also put a full path in the cell, such as D:\PCW\PCW 2002\NewFile. In that example the copy will be called NewFile.xls and the new file will be put in the specified folder.

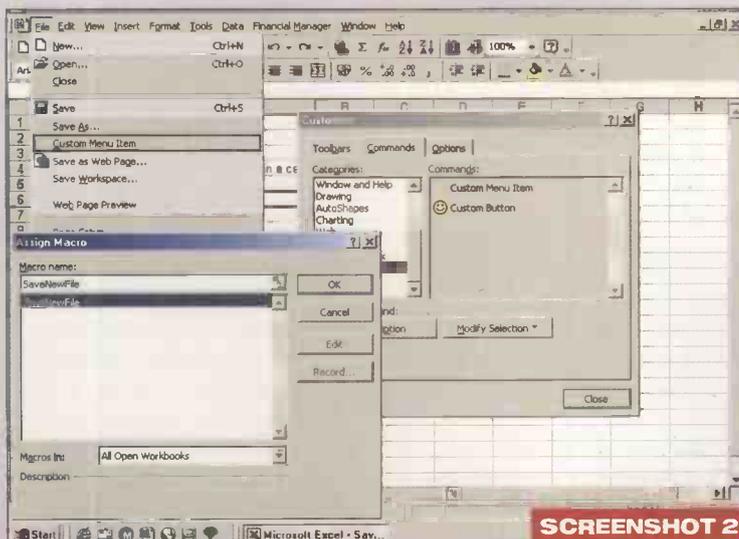
```
Sub SaveSheet()  
Application.DisplayAlerts = False  
ActiveSheet.Copy  
ActiveWorkbook.Close  
SaveChanges:=True,  
Filename:=Range("A1").Value  
Application.DisplayAlerts = True  
End Sub
```

To make a new menu item for firing the macro choose Tools, Customise, Commands and under Categories choose Macros. Drag the line, Custom Menu Item, up to the File menu. When the File menu drops down, position the new item where you want it on the list. Right-click on the new item, and under Assign Macro, pick the name of your new macro, see screenshot 2.

Under Name, on the item Properties menu, change 'Custom Menu Item' to &New Save (or an ampersand followed by your chosen menu item name). To finish, click the Close button on the Customise dialogue box. The File menu will now offer the chance to Save (the existing file); Save As (the existing file with another name), or to use New Save (which will save the file with the name given in cell A1).

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Contact him via the PCW editorial office or email: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.



SCREENSHOT 2

Creating another version of Save As on the File menu

Clean sweep

Mark Whitehorn digs deep inside the Microsoft Database Engine and gives some tips on cleaning data

Microsoft supplies Access and SQL Server as its database engines. However, with Access 2000 the company introduced Microsoft Database Engine (MSDE). Most people will come across MSDE first when they are using Access. You can develop Access applications in the normal way as an mdb file, in which case Access will use its Jet engine as the underlying database engine. Or you can elect to develop a so-called 'project' file in which case Access will use either MSDE or SQL Server as the database engine. It allows you to choose which, although clearly you have to have either or both installed in order for this choice to be meaningful (see below for information about installation).

So why would you bother developing an Access application as a project file? Well, in the past, many Access applications have started as single-user databases, then moved to multi-user and then eventually, as they become mission critical for the company, are upsized to a full-sized client-server application.

This upsizing can be a complex operation – but one that is made much easier if the database engine used remains effectively the same throughout – which brings us back to MSDE.

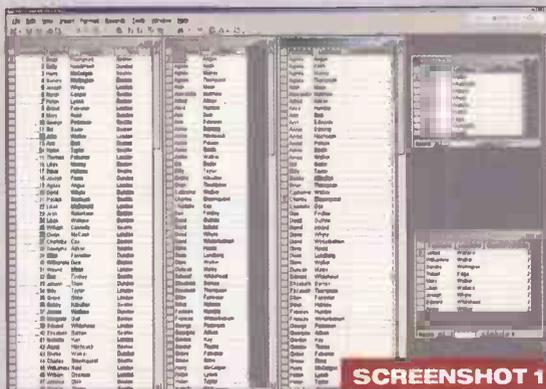
MSDE is essentially the same database engine as SQL Server but it lacks a user interface, management tools such as Enterprise Manager, any of the analysis capabilities and the more complex features such as merge replication support, client access licences, developer libraries and the SQL Server Books Online.

It also limits database size and its performance throttled – carefully constructed so its performance plummets when the number of concurrent users rises above something like five. (The actual figure of concurrent users that it can support depends on the application.)

These limitations make MSDE sound like a waste of space, but in practice it is wonderful for the purpose for which it was designed. It runs fine as a back end to Access applications and makes upsizing much easier.

New name

Naturally, as the MSDE had grown in popularity, Microsoft has decided to change its name with the release of



The Customer table Customerdups, which has duplications, and the four queries used to find those duplications

Access 2002 to the snappier 'Microsoft SQL Server 2000 Desktop Engine.

All of which was prompted by two emails I received recently. One was about installing the Microsoft SQL Server 2000 Desktop Engine (see Question Time) and the other was from Simon West.

He installed MSDE and was trying to get to grips with both the engine and its security implications. He found an article on Technet (Q285097) which told him how to change from integrated Windows security to SQL security, but that didn't allow him to set a password for the sysadmin account (which is, by default, called 'sa').

Since he didn't want to leave the MSDE server running with no password on the sysadmin account, he was keen to know how he was supposed to achieve this, given that MSDE has no GUI tools such as Enterprise Manager. Before I could even reply, he turned up the answer for himself, which is to use the command line utility called osql.exe that is installed with MSDE. This allows 'Transact-SQL' commands to be typed.

The following sequence works fine.

```
c:\>osql /E
1> EXEC sp_password ✓
NULL, 'newpassword', 'sa'
2> GO
3> EXIT
```

(Key: ✓ code string continues)

Simon also says that there is a great resource for learning about it at http://msdn.microsoft.com/library/default.asp?url=/library/enus/tsqlref/ts_sp_pa-pz_5x44.asp.

Cleaning data

In the February issue I talked about a problem which, as a side issue, involved cleaning up some data, specifically a

customer list. It is clear to me now that I made an error of judgement in treating this as a side issue. To judge by the number of emails I've had, cleaning up data is one of the major obsessions of people who read this column, and they are desperate to know how to do it.

The bad news is I really can't tell you how to clean up your customer list, or any other set of data containing duplications etc. It's not that I don't want to, it's just there is too much variation for me to be able to give you a formula to follow which will result in clean, sparkling data.

Cleaning data turns out not to be a science, but an art. On the other hand, that's the good news as well. I actually enjoy sitting down with a big table of messy data and cleaning it up – the job is an Intellectual challenge as there is no formula to follow.

Dirty data typically suffers from not just one problem, but several. For example, you might have two customer lists that you want to combine into one. However, you know that there are duplicates between the tables (some customers appear in both tables), and that there are duplicates within the tables (some customers appear multiple times in each table). Even worse, the spelling of the customer names has not been carefully controlled – so Brian Right and Brain Wright may, or may not, be the same person.

The trick is to look at the data and identify the main problem, then you can select one or more tools from the toolbox of techniques that you have acquired over the years. You apply those until that problem has been beaten into a corner, and then start on the next one.

I really can't tell you how to do it, but I can at least introduce you to some of the tools I use. I'm not saying that I have the definitive set, so if you have one, send it in and we'll publish the best.

Tools for the job

OK, the first and most obvious tool in the box is the Select query. You can use it to sift through data to find out what is wrong with it. Never leave home without it.

Next favourite has to be the Group by Query. This is wonderful for finding out what duplicated data you have in a table. In the sample database, DBCJUL02, which I have posted on my website



www.penguinsoft.co.uk/mdbs) there is a Customer table (see screenshot 1) called Customerdups containing 115 records in total, but some are duplicates.

The query called Find Duplicates:

```
SELECT FirstName,
LastName
FROM CUSTOMERDUPS
GROUP BY FirstName,
LastName;
```

groups together customers with the same first and last name. This reports 105 records which, combined with the knowledge that there are 115 records in the table, tells us that 10 are duplicated.

We can get the query called Find Duplicates2 to count the number of records in each group by adding:

```
SELECT FirstName,
LastName,
Count(FirstName) AS
CountOfFirstName
FROM CUSTOMERDUPS
GROUP BY FirstName,
LastName;
```

This tells us how many records of each type are duplicated. But if only we could get the query to show us just the ones that are showing duplicated values. Well, those are the ones where the count of records is greater than one, so what about Find Duplicates3:

```
SELECT FirstName,
LastName,
Count(FirstName) AS
CountOfFirstName
FROM CUSTOMERDUPS
GROUP BY FirstName,
LastName
HAVING
```

Count(FirstName)>1; and, as the final icing on the cake, we could get the query to order the duplicates in descending order: Find Duplicates4:

```
SELECT FirstName,
LastName,
Count(FirstName) AS
CountOfFirstName
FROM CUSTOMERDUPS
GROUP BY FirstName,
LastName
HAVING Count(FirstName)>1
ORDER BY Count(FirstName)
DESC;
```

Now we can see who the offenders are and take the appropriate action, bearing in mind that, if you so desire, you can turn this into a Make Table query, which will give you a permanent record of the duplicates.

Is this a good idea? It depends on the real-life problem you are trying to solve. I can't tell you that it is always



SCREENSHOT 2



SCREENSHOT 3

appropriate to use a Make Table query, but the option is always there. It's simply another tool in the box.

Finding common records

Now suppose we have a different problem. We have two customer lists Customer and Customer2.

The first has 100 records, the second 101 (see screenshot 2). However, the majority are duplicates, not within the tables, but between them. So how can we find the records that are common?

An easy one this: use a Select query.

The query 'Find Common Customers' does the job (see screenshot 3):

```
SELECT
CUSTOMER.CustomerNo,
CUSTOMER.FirstName,
CUSTOMER.LastName,
CUSTOMER2.CustomerNo
FROM CUSTOMER
INNER JOIN CUSTOMER2
ON (CUSTOMER2.LastName =
CUSTOMER.LastName) AND
(CUSTOMER.FirstName =
CUSTOMER2.FirstName);
```

Here we are saying to the query: 'Match the first and last name, and show us all the records where you can find the same first and last name in both tables.' As a bonus, we are seeing the CustomerNo from each table that may make life easier. The answer table shows us that there are 99 common records.

Top: These two customer tables have a large set of common records. How can we find those, and how can we find the unique ones in each table?

Bottom: The answer – with queries of course

OK, that was easy, now a slightly more tricky one. What about a query to show the records which are found in Customer but aren't found in Customer2? Here we need a Select query, but we need to use what is called an Outer join – one that returns all the records from one of the tables (in this case Customer), and only those from the other table that match.

The query 'Extra Customers in Customer' does the trick:

```
SELECT
CUSTOMER.FirstName,
CUSTOMER.LastName,
CUSTOMER2.FirstName,
CUSTOMER2.LastName
FROM CUSTOMER
LEFT JOIN CUSTOMER2
ON (CUSTOMER.LastName =
CUSTOMER2.LastName) AND
(CUSTOMER.FirstName =
CUSTOMER2.FirstName);
```

(Outer joins come in two flavours, Left and Right, which explains why this is still an Outer join, even though the word itself doesn't appear in the SQL).

This works OK and actually identifies the extra records in the Customer table, but we have to scroll around to find them. In fact, the only records in this answer table that interest us are the ones where there is no matching record from Customer2. So we can isolate those by adding a Where clause that only extracts those records where the information from Customer2 is non-existent (query 'Extra Customers in Customer Second Attempt'):

```
SELECT
CUSTOMER.FirstName,
CUSTOMER.LastName
FROM CUSTOMER
LEFT JOIN CUSTOMER2
ON (CUSTOMER.LastName =
CUSTOMER2.LastName) AND
(CUSTOMER.FirstName =
CUSTOMER2.FirstName)
WHERE
(((CUSTOMER2.FirstName)
Is Null) AND
((CUSTOMER2.LastName) Is
Null));
```

As an exercise try to build a query that does the same for Customer2 and then try to build on that to show the extra records from both tables at the same time. (Hint: Union).

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Contact him via the PCW editorial office or email: database@pcw.co.uk. Please do not send unsolicited file attachments.

You're surrounded

Niall Magennis immerses himself in the world of 4.1 and 5.1 surround sound speakers

Speakers are simple, right? You connect them to your PC and they produce sound. Well that's how it used to be, but things have become more complicated over the past couple of years, thanks to the arrival of surround sound.

Let's get one thing clear before we begin. A good surround sound setup really makes a huge difference to games and movies. There's nothing as good for scaring yourself witless as being able to hear, but not see, an alien baddie moving in behind you in a first-person shooter. And once you've watched DVD movies with full 5.1 Dolby Digital surround sound, a normal stereo setup will never suffice.

But with so many surround sound formats and speaker setups on the market, trying to pick one that is right for you, and then getting it set up properly, can make your head swim more than any surround sound effect ever could.

Early surround sound implementations offered four-channel output. This was simply a case of adding an extra stereo output to the sound card to cater for two rear channels. These two stereo outputs were then pumped directly to two sets of stereo inputs on a 4.1 surround speaker system.

A 4.1 system simply means that it has four satellite speakers and one low-frequency speaker (called a subwoofer) for bass effects. On these early surround sound cards there was no extra output for a subwoofer, so the speaker system simply pumped the low frequencies to the subwoofer.

This kind of setup is great for gaming as four-point systems are generally cheaper than 5.1 systems (which add a front centre speaker), yet offer good surround possibilities for games developers to exploit in order to scare the pants off you.

Game formats

The two main surround sound formats for gaming are A3D and EAX. Since the remains of Aureal were taken over by Creative, only EAX is still being actively developed. This is a shame, as A3D had a lot to offer. Whereas EAX only used reverb algorithms to simulate a 3D room's size in audio, A3D could actually work out reflections and refractions based on the



Some software DVD players can downmix a 5.1 signal to make it suitable for four-speaker systems

geometry of not just the room, but the obstacles in it too, so it was much more accurate. However, it was also more processor intensive.

Luckily Creative is beginning to add some of the modelling features of A3D to EAX. Pretty much all surround-sound-capable cards support at least one version of both A3D and EAX.

Four-point systems can also be used for DVD surround sound playback, however there obviously has to be some clever jiggery-pokery going on to make a 4.1 system sound like a 5.1 system (see screenshot 1).

What is missing in a 4.1 system that is present in a 5.1 system is a centre channel. The approach most software DVD players take is to feed the centre channel audio stream equally to both of the front speakers in an effort to create a 'ghost' centre speaker. The results are

generally good, but there are scenes in some movies where the centre dialogue may sound quieter than it should. However, as most people place their front speakers either side of their monitor, and sit quite close to them, the problem is usually diminished in a typical PC setup.

Of course, the best overall solution for PC sound is a full 5.1 speaker setup. But the world of 5.1 is more complex than you may initially think. In order to hear 5.1 surround sound you'll need a decoder as well as a set of 5.1 speakers. The decoder takes the surround sound information from the audio in the game or DVD movie and deciphers which sounds are meant to go to which speaker.

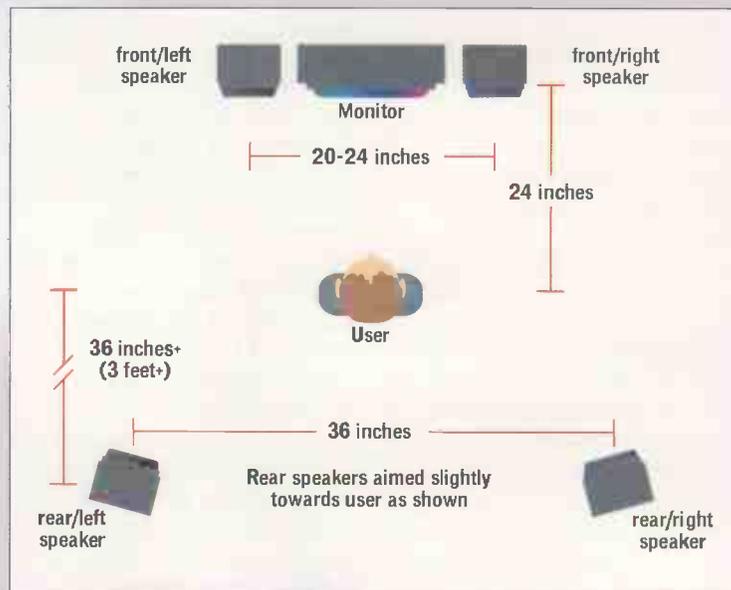
Up until last year if you wanted to decode 5.1 surround sound you had to use an external decoder. In this scenario you run a lead from the coax or optical digital output of your sound card to the digital input of the decoder. The decoder then feeds the decoded audio stream to the 5.1 amp that drives the five speakers and the subwoofer.

Breaking the code

Decoders are generally quite expensive, costing anywhere from £100 to many thousands of pounds for a top-of-the-range model.

Luckily, sound card manufacturers started to develop chips for their cards that allowed the card itself to decode the surround-sound streams and output it via multiple analogue connectors.

It's important to get your speaker placement correct when using a surround sound setup



The Creative Live 5.1, Creative Audigy, Philips Acoustic Edge and Terratec DMX 6Fire 24/96 (pictured right) can all do onboard 5.1 decoding. With these cards you only need a set of 5.1 speakers and surround sound amp, saving you the cost of an external decoder.

However, for some people it may still be better to opt for a setup that includes an external decoder, but why is this? Well the decoder will allow you to use your 5.1 surround sound speakers with many different devices, whereas if you use a sound card for the decoding you can only use the speakers with the PC.

DVD players, games consoles and digital set-top boxes can all output a digital surround sound stream, but if you don't have an external decoder you won't be able to use your speakers with them. External decoders also tend to support more surround sound formats. The range of surround sound formats currently in use is quite large and, as a result, there is much confusion over what each one does, so let's run through the capabilities of the main players.

First up is Dolby Surround. This is the oldest of the surround sound standards currently in use. A Dolby Surround signal contains four channels of information encoded in a single analogue stereo stream. The decoder looks at the stereo stream and extrapolates out Front Left, Centre, Front Right, and Rear Surround channels from the two-channel signal. The two rear speakers simply produce an identical mono signal so full surround panning is not supported and the centre channel is really just a ghost channel of the left and right front speakers.

Next comes Dolby Pro Logic. This format is now the standard for VHS tapes and some TV broadcasts. It improves on Dolby Surround by adding support for a dedicated centre channel and better sound placement, although the rear channels are still essentially mono.

Both Dolby Surround and Dolby Pro Logic decode the signal from an analogue stereo stream, but modern hardware such as computers and DVD players can output digital streams, and this is where the next step, Dolby Digital, comes in.

Dolby Digital adds stereo rear surround channels that allow sound to be much more accurately placed. It also has a



The Terratec DMX 6Fire is one of the new generation of sound cards that can do onboard 5.1 decoding

dedicated subwoofer channel that allows for low-frequency effects.

Finally, there's DTS. This is a competing format to Dolby Digital. The main difference between DTS and Dolby Digital is that the DTS stream uses less compression so it should theoretically sound better. However, Dolby Digital is more widely supported and relatively few DVD discs offer DTS sound, though this may change in the future.



Basically, if you're looking for an external surround sound decoder you need to make sure it does Dolby Pro Logic and Dolby Digital to cover you for both analogue and digital streams. But if you're looking for slightly better audio from some DVDs, then you may want to get a decoder that also supports DTS.

Setting up

Once you've chosen your surround sound system you'll want to get the most out of it. The first thing to do is to

get the right speaker placement. The centre speaker should naturally be placed dead centre with your screen and the two front stereo speakers should sit equidistant from either side of it. Because humans generally don't pick up directional information from low frequency sounds, it doesn't really matter where you place your subwoofer, but most people place it near the centre speaker for convenience.

Normally you would place the rear surround sound speakers at about the same distance behind your head as the front speakers are from the front. However, because when we're playing games we sit so close to the screen, it's probably a good idea to locate the surround speakers slightly further back than normal.

Just as important as speaker placement is getting your connections right. Speakers in a surround setup (or a stereo one for that matter) should move together in the same direction, or in technical speak, be in phase.

If you connect them in the wrong way then some of the speakers will be moving in the opposite direction to some of the others, or be out of phase. Speakers that are wired out of phase will lack bass response, have woolly tonal quality and sound a lot less punchy than speakers that are correctly wired. In a surround sound setup this will also mess up the surround sound balance and reduce the overall effect.

Speakers are connected by two-strand cable and each strand is given a different colour, usually red and black or black and white, to help you get the connections right. It doesn't really matter which way around you connect the speaker wire on an individual speaker, but it's very important to be consistent between both speakers.

The simple rule is to always connect the red or white wire to the red or + connector on the rear of the speaker and amp and always connect the black wire to the black or - (negative) connector on the speaker and amp.

With everything set up, all that's left is to load up your scariest game or most action-packed movie and sit back and enjoy the experience. But don't blame us if you scare yourself silly!

CONTACTS

Niall Magennis welcomes your comments on the sound column. Contact him via the PCW editorial office or email: sound@pcw.co.uk. Please do not send unsolicited file attachments.

Ready to roll

Ken McMahon investigates the art of rollover graphics for the web using Imageready's new features

Any image-editing application worth its salt provides tools for producing the Javascript rollovers beloved of web designers the world over. Despite the fact that you can produce visually appealing, bandwidth-friendly and efficient rollovers using DHTML, the flexibility that images provide means Javascript is still by far the most popular way of doing things. In the past I've used Macromedia Fireworks, Dreamweaver and Photoshop to create rollovers, although, I confess, I haven't attempted to hand code them for a long while. Why bother, when it's far easier with the tools now available in these applications?

Photoshop 7, or rather Imageready 7, has introduced a number of new features that extend what you can do from within the application and mean less messing about filling in the gaps afterwards.

Essentially, Imageready will create layer-based rollover states for the normal, over and down states of a button, which is all most of us ever bother with. But Imageready goes further, allowing you to select layers and produce code for additional states including click, out, up and selected – you can even define your own states, though you have to do your own Javascript tweaking to make use of them.

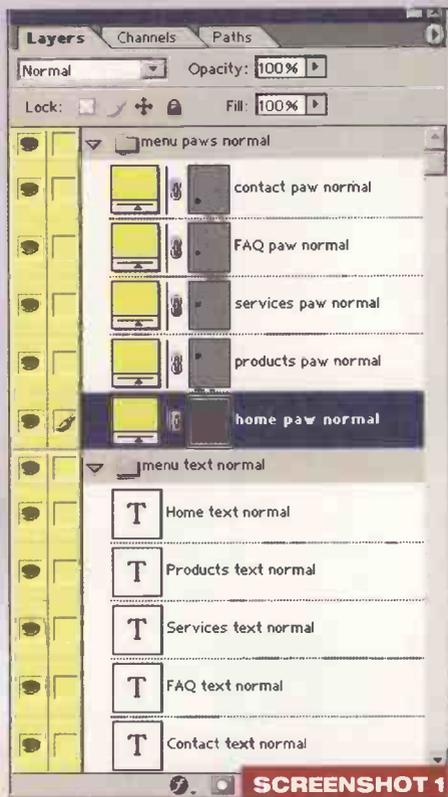
The key to producing successful rollovers is planning. While it's easy enough to produce a simple two-state button without much forethought, even a simple navbar, like the one I've produced here for a pet products site, will benefit from a five-minute planning session first.

Anatomy of a navbar

My navbar consists of five selection options, each of which has a paw graphic to the left of it. I've enlarged it on the opposite page so you can get a better look at it.

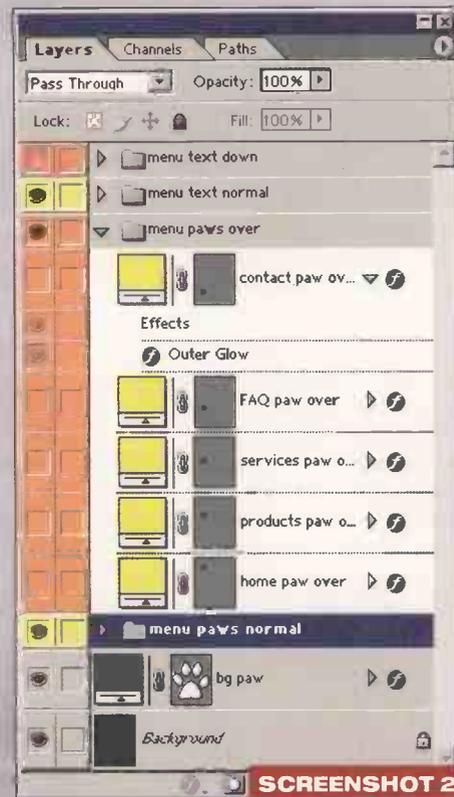
The plan is to create layer-based rollovers so the paw glows when the menu text is rolled over, and the text turns white when the menu item is selected. I'm also going to use the new selected state so that when the browser loads up the selected page, the menu text remains white, indicating the current location.

Because the rollover slices will be layer-based, each element must go on a separate layer (see screenshot 1).



Above: Text and paws organised into two layer sets

Above right: All four layer sets with the paws over set expanded to show the glow layer effect



Using Photoshop's layer sets helps streamline the process and keep everything organised. The big paw on the background layer, like the menu paws, is a custom shape with a layer effect applied (Bevel and Emboss in this case).

I drew the first paw and then duplicated and renamed the layer four times. Then I linked the five menu paw layers and selected New Set from Linked in the Layers palette menu. Assigning a colour to the layer set will help you keep track of things.

The procedure for creating the text is exactly the same – create one text layer, duplicate and overwrite it (there's no need to rename because Photoshop does this for you using the text itself as the basis for the layer name), link the text layers and create a new set from linked.

Adding states

You should now have two layer sets for the normal state of each menu option. I've called them menu paws normal and menu text normal.

To create the over state for each menu item, duplicate the menu paws normal layer set and rename it menu paws over, for clarity I've added the

word 'normal' to each layer in the normal set and the word 'over' to each layer in the over set.

Select each of the layers in the menu paws over layer set and apply the outer glow layer effect with the default settings. Don't be tempted to copy and paste text between shape layer names or you'll get some unexpected results.

Next you need to duplicate the menu text normal set, rename the layers by replacing the word normal with the word down, and change the text colour to white.

You should now have four layer sets, menu text normal, menu text down, menu paws normal and menu paws over. I've coloured my normal layers yellow and rollover layers orange.

The layer order is quite important – if the layer for the over state is beneath the normal layer you will need to turn off the normal layer as well as turn on the over layer when it comes to making the rollover, a small extra effort, but it all adds up.

Turn off layer visibility for the rollover layer sets and hit the jump button at the bottom of the toolbox to open Imageready 7 (see screenshot 2).

Making the rollovers

In Imageready, select Window/Rollovers to display the rollovers palette if it isn't already there. I find it helpful to make the layers and rollovers palettes as big as possible and position them next to each other. Select the products text normal layer in the menu text normal set and click the Create Layer-Based Rollover button at the bottom of the rollovers palette – the slice is created and Imageready automatically creates the over state. In the slice palette enter products.html in the URL field.

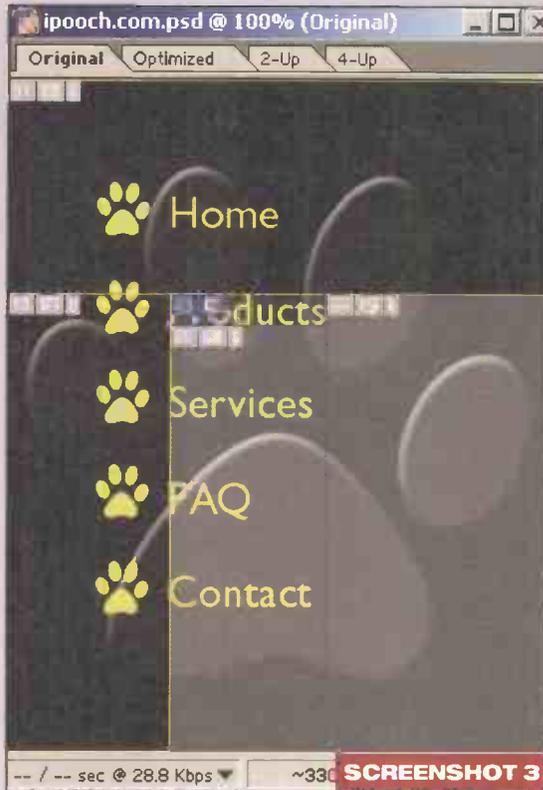
Select the over state, expand the menu paws over layer set and make the products paw over layer visible. You can check everything is working at this stage by clicking the preview in default browser button in the toolbox, as you rollover the Products text the paw should glow (see screenshot 3). To create the down state click the create rollover state button on the rollovers palette and make the products text down layer visible. The products menu text should turn white, if it doesn't and you are in the optimised tab, switch to the original or two-up view (press Ctrl & y to toggle through).

If you preview again this should all work fine, the paw glows when you rollover the Products text and the text itself turns white when you click it. It works, but it's not very efficient. Take a look at the way the image has been sliced and you'll see that to create the slice for the products text layer, Imageready has had to create four slices around it to carve up the entire image into rectangles. If the only thing changing were the products text layer this wouldn't be a problem, but our rollover works on the paws. To make the products paw glow, two very big slices currently need to be changed.

Optimisations

To remedy the situation click the products paw normal layer and select Layer/New Layer Based Slice. The products paw now has its own small slice and this should be the only graphic that needs updating when the Products text is rolled over. Select File/Save Optimized As, Save As Type HTML and Images and All Slices into a new folder.

Double-click the HTML file to open it in your default browser and check everything works OK. Imageready creates an Images folder for all of the image slices; open the folder and take a look at the contents. There are an awful lot of slices for a menu bar with only one rollover. If you go back to Imageready, choose the slice select tool and check the



SCREENSHOT 3



SCREENSHOT 4

Hide Auto Slices button on the tool options bar you'll see the only two slices we should have rollovers for – products text normal and product paw normal. The gifs for these rollovers are products-paw-normal.gif, products-paw-normal-Product.gif, Products-text-normal.gif and Products-text-normal-down.gif. But in addition there are numerous rollover state gifs for slices that shouldn't change.

On closer examination these turn out to be slices that are adjacent to the paw rollover. What is happening is that because the outer glow layer effect breaks the boundaries of the image slice – which was defined by the products paw normal layer – the adjacent slices are all affected. The solution is to use the product paw over layer – the one

Always base slices on the outermost boundary of a rollover – unlike here, where the glow spreads into adjacent slices

Left: To make the products paw glow, both auto-generated slices one and two need updating

with the outer glow – to define the slice (see screenshot 4).

This kind of thing shows why, with any application that automatically generates HTML tables, Javascript and associated images, you can't just hit the export button and expect everything to be fine. In this case, while everything appears OK, the navbar is weighed down with extraneous, irrelevant gif files.

The selector

What about that Selected state I mentioned earlier? Well, if you select product text normal in the rollovers palette and click the add state button, a new state labelled click will appear. Right-click this, choose Selected from the contextual menu and arrange your layers accordingly – I've turned off the glowing paw and turned on products text down, so the products menu item will appear white on the products page.

If you preview this, or Save Optimised you'll find no difference in the HTML or images. To get it to work you'll need to double-click the selected state in the rollovers palette and check the Use as Default Selected State box. Now Save Optimised As and select HTML only from the Save As type pulldown menu.

Don't change the filename at this stage as it will change all the image references. Instead, save the page to a new location with the same filename as the original, then rename it products.html and place it in the folder with the original page and images folder.

You now have two HTML pages, the first contains the navbar with the functioning Products rollover, which links to products.html containing the navbar with the products menu item in the selected state. Despite its improved tools for creating rollovers, don't expect Imageready to provide everything you'll need. What it does give you is a good starting point from which to produce navbars and other animated graphics from layer-based images. To make the most of it, you need to plan, and be prepared for plenty of tweaking.

CONTACTS

Ken McMahon welcomes your comments on the Graphics and DTP column. Contact him via the PCW editorial office or email: graphics@pcw.co.uk. Please do not send unsolicited file attachments.



Blender shaky but Maya is set free

Benjamin Woolley investigates Maya Personal Learning Edition and asks if Blender will be revived

In the spring I received the following email, which I am reproducing, not just because of the flattering remarks about this column, but also because it contained some news that will be received with sadness by every 3D enthusiast. The email was sent by rookie graphics pro Shane Christopher: 'I've been an avid amateur 3D (and lately 2D) artist since your January 2001 article introduced me to Blender (see screenshot 1). I was 15 and spent a lot of my spare time working with Blender.

'In February of that year I joined a project to create a game based on the Civillisation series. Our main feature was a spherical world using hexes, a 'Buckyball'. Unfortunately that project ended, like many Internet game projects do, due to lack of programmers. Since then I have joined another project that has been going for three years and has strong support at its site www.rjcyberware.com. I would like to thank you for introducing me to the world of computer graphics and probably changing the course of my life.

'But that isn't why I mailed you. I have noticed that you have mentioned Blender in some previous articles and so you are probably interested in it. I learned today that Nan Technologies has shut down... I feel like many thousands of other Blender users that this is a shocking and unjust end to such a product that has changed in some way the lives of so many.

'I would just like to express my sadness about this loss to the graphics industry and my hope that somehow funds will be raised to restart the project.'

Since that letter was written, the picture has improved. At the time of writing (April), Nan was still operating and undergoing a 'reorganisation', and offered a curtailed version of its website (www.blender.nl). Clearly the cost of developing and supporting a 3D package that most used for free presented problems, which the company is now being forced to address.

Discussions of Nan's troubles have, as you would expect, been vigorous among members of the Blender community, for example at www.elyslun.com. Gatherings are being scheduled, petitions arranged, and everyone is hoping for the best. The story is moving too fast for a monthly column such as



SCREENSHOT 1

What future Blender? The distinctive interface that made the 3D software so bewildering to newcomers, but so beloved by experienced users faces an uncertain future

this to keep up, so readers are advised to hit the web to discover the state of play. Whatever happens, Blender's problems have cast a shadow over 3D software developed under these sorts of licensing arrangements. Clearly, it is not the enthusiasm of users, but distant meetings and banking arrangements far beyond our understanding or influence that will shape its future.

When it first announced its problems, Nan sounded an optimistic note: 'There are a lot of believers and non-believers for every topic and scenario. But in general there's a unified feeling among everyone - users, employees and shareholders - that Blender still has a warm living heart, still alive, and worth being continued.' Amen to that.

Maya PLE

The Lord taketh away and the Lord giveth... Almost simultaneously with the news of Blender's potential demise came a more welcome, indeed astonishing announcement: Alias Wavefront was offering free copies of its 3D software Maya.

The Alias Wavefront website provides tutorials and case studies for Maya PLE users



SCREENSHOT 2

To put this in perspective, at around the same time the company also announced a reduction of the price of its full package, Maya Unlimited, from £13,560 to just under £5,000. Naturally there are a few differences between the retail and free versions, but not as many as you might expect.

Maya's publisher, Alias Wavefront, is a part of Silicon Graphics (SGI), the company that made its name creating some of the most powerful graphic workstations in the world.

Its decision to offer a version of Maya for free is clearly part of a strategy designed to consolidate the company's position as a leader in the graphics field. But it is also an attempt to address a problem mentioned by Shane in his email above: the current dearth of 3D expertise.

Maya Personal Learning Edition (PLE), the version available for free, lacks some of the plug-ins provided with Unlimited. Nor, as you would expect, does it come with support. But you do get a full working edition of the core product, complete with Nurbs modeller, inverse kinematics, particles, physical dynamics and even a couple of plug-ins: Maya Artisan and Maya Paint Effects.

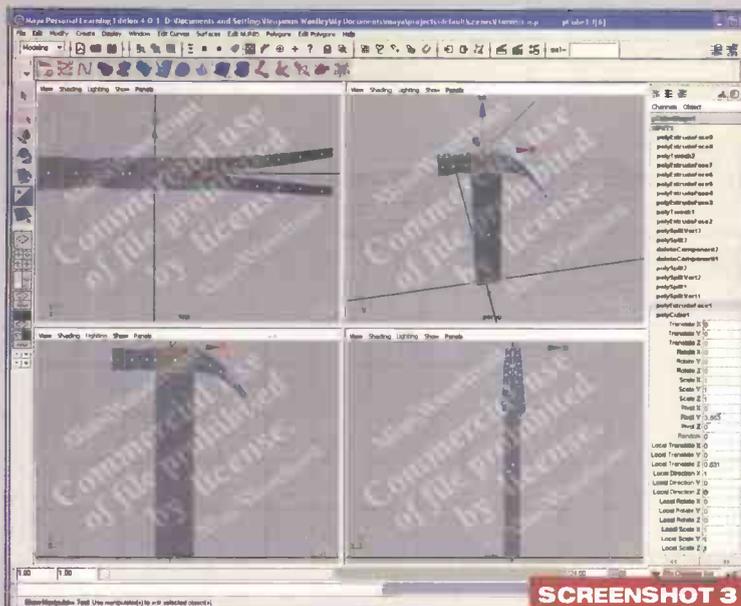
You also get, crucially, a collection of well-designed tutorials, which take you quite deep into a very complex and powerful package (see screenshot 2). There are a few limitations, however: renders are limited to a resolution of 1,024 x 768, the software uses a special .mp file format rather than the standard Maya ones (.ma and .mb), you cannot import or export any other file formats, and the viewports, rendered images and some texture maps are heavily watermarked with the legend 'Commercial use of file prohibited by license' and the Alias Wavefront logo.

More free software

Maya is not in fact the first professional-grade commercial 3D package to be provided for free.

Discreet offers Gmax, a games development platform based on 3D Studio Max (see 3D Hands On, February 2002). Gmax is a powerful package too, and does not use watermarking. However, it does have other limitations.

You cannot, for example, produce a finished render, watermarked or



Left: Maya Personal Learning Edition, with a scene from a modelling tutorial about creating a hammer object

quickly or easily given that the company is based in Toronto.

Running Maya

What, then, is Maya PLE like? I suspect few readers will have used Maya before. I certainly hadn't, and did not know what to expect from software that is worth the thick end of £10,000.

First impressions are overwhelmed by the prominence of the watermark. Once you have got over the shock of that, however, you start to delve into what is undoubtedly a powerful piece of software. It was also extremely stable on my system, though full rendering, which makes predatory demands on the processor, more or less froze the display.

When you run the software, a welcoming web page also opens in a browser window providing links to tutorials and other resources. The 'Instant Maya' tutorial is excellent, although the expertise you will acquire by working through it is hardly instant. It will take days or even weeks to get through the 10 modules, but at the end of it you will have a pretty good grasp of 3D graphics editing techniques as well as Maya (see screenshot 3).

In other words, even if you are likely never to use Maya in anger, it is still worth getting hold of Maya PLE and working through the tutorial. I tried out a few of the more advanced features of the software (I will look at a selection in more depth in future columns).

One I particularly liked was Interactive Photorealistic Rendering (IPR) (see screenshot 4), a neat intermediary between realtime shading in the viewport and a production render.

You can produce an IPR in a fraction of the time of the full render, but still get enough detail to check textures and lighting. Furthermore, the interactive element allows you to choose an area of the image and have that updated in more or less real time as you edit the scene in the viewports. Very neat.

Everyone with an interest in 3D should download a copy of Maya PLE from www.aliaswavefront.com/freemaya. It is an unmissable opportunity. My only reservation is the prominence of the watermark – I hope the company tones it down in future releases.

CONTACTS

Benjamin Woolley welcomes your comments on the 3D Graphics column. Contact him via the PCW editorial office or email: 3d@pcw.co.uk. Please do not send unsolicited file attachments.

otherwise. Discreet claims to have nearly 140,000 users already, and those who are not already among them should download the latest version from www.discreet.com/products/gmax/gmaxconsumer.

Gmax has one advantage over Maya, besides the absence of watermarks. It is a mere 50MB download and will run under Windows 98 as well as 2000. Presumably it also runs under Windows ME, although this is not specified on the download page and I have not tried it myself – there is no Mac or Linux version nor is there likely to be, as the 3D Studio product family from which it is derived grew up in the Dos/Windows environment and has resolutely stayed there ever since.

The Windows version of Maya is 136MB and the Mac OS X version 149MB (there is no Linux version). The Windows version will only run under NT, 2000 or XP and requires hefty hardware: a Pentium running at 600MHz or faster, 512MB and a graphics card with OpenGL hardware acceleration.

The Mac minimum requires the same Ram and graphics card spec, and a G4 processor (though G3 systems 'may be acceptable for general Maya use').

Most users will know whether their system has the right amount of Ram, but it is important to check that your graphics card provides OpenGL hardware acceleration as well.

Support for OpenGL under Windows 2000 and XP depends on the graphics card you are using, not on Windows (which only provides native support for DirectX out of the box). You will need to check either the diagnostics/driver software installed with your graphics card or on the vendor's website.

For certain operations, particularly



those associated with Artisan or Paint Textures technology, you also need hardware support for Overlay Planes to get decent performance. Quite a few cards do not have this, including those based on the Nvidia Geforce2, ATI Rage128 and Matrox G400 chipsets. My system, a 1.4GHz Dell 8100 with a 32MB Nvidia Geforce2-based card just about managed to cope, but it wasn't comfortable. I suspect the graphics card was the bottleneck.

Before downloading, it is therefore worth checking out the list of 'qualified' hardware posted by Alias Wavefront at www.aliaswavefront.com/en/Community/Support/qualified_hardware/QUAL/maya_40_NT.html.

When Maya Personal Learning Edition was first announced, the company's servers were clogged for days on end, and only the very dogged and patient were able to download the massive distribution file (including yours truly, who spent the best part of a week trying to get it).

It is possible to get a CD-Rom for a few dollars, though probably not very

Above: The Interactive Photorealistic Rendering (bottom right) shows a near production-quality which updates to show changes to the scene in near-time

New! Microsoft® MCSE Course

Choose a **FREE 25 piece Computer Tool Kit or Digital Multimeter**
PLUS The Macmin PC Engineers Software Tool Kit CD
Just for looking at one of our Courses!

START FROM
£24.99!
 + P&P

NEW!
MCSE & A+

Why not get MCSE or A+ Certified as a Professional PC Engineer?

Ask for **FREE**
Info Pack

- At Macmin Technical, we have trained over 20,000 PC engineers - why not join them in this exciting & rewarding career?
- Demand outstrips supply for A+ and MCSE certified PC engineers. ■ CompTIA A+ Certification or Microsoft® MCSE

Yes, FREE Gifts with the A+ or the MCSE course.

The Macmin PC Engineers Software Tool Kit CD

★ Without a Course, £9.99. With one, FREE!

- Includes:**
- Registry First Aid - Fixes Registry Errors
 - Ultimate Boot Disk for Windows - Starts a System After Fatal Crash
 - Fresh Diagnose - Analyzes & Benchmarks Systems and many more.....

This is yours to keep, even if you get a refund, just for looking at the A+ Course.

Plus, For a limited period Choose either

- ★ Amazing 25 piece Computer Toolkit & Case or
- ★ Fantastic Digital Multimeter
- ★ Without a Course, £19.99 each, With one, FREE!
- ★ *Or choose BOTH for just £9.99* (only with a course) - Great Deal.

But please hurry, this is a Limited Offer, and we don't want you to miss out!

Should you choose MCSE or A+?

- ★ Choose A+ if you want to qualify as an entry level PC engineer, or if you want to do your own computer repairs etc. Course materials include two big binders with CDs (one for each exam). Fill these with over 1,000 pages of illustrations, diagrams, text & self tests in 10 easy modules. This course only assumes you can use a PC.
- ★ Choose MCSE if you want to qualify as an advanced systems engineer. The course materials include seven big binders with CDs (one for each exam). Almost 4,000 pages of illustrations, diagrams, text & self tests. This course assumes you are already experienced to junior PC technician level.

Low Cost

A+

- ★ Study for a new future, as an entry level PC technician, for just £199.90 + P&P.
- ★ Alternatively you can pay in 10 instalments of £24.99.
- ★ There is only one charge of £9.99 P&P and this covers delivery of all 10 modules.

MCSE

- ★ Study for a new future, as an advanced systems engineer, for just £699.00 + P&P.
- ★ Alternatively you can pay in 7 instalments of £124.99
- ★ There is only one charge of £34.99 P&P and this covers delivery of all 7 binders etc.



Daily Telegraph
 Salaries of £25,000 are common and £40,000 is not unknown

Computing Magazine Skills shortage threatens national economic growth



What others have said about Macmin courses

Your publication on this subject is quite the best I have yet come across - well presented in a manner in which the information is easily assimilated.
 E. Griffiths, Stafford.

"...I find it very informative, very clear. I would certainly have no hesitation recommending this package to anyone - this I certainly will do for my friends."
 Les Boslock, Birmingham.

Inspecting the material I would like to say it is excellent - easy to follow and I don't foresee any problems absorbing the information. A very sincere thank you.
 Mr. R. Gwynne, Penmaenmawr, Conwy

Reviews
 "..... accessible & comprehensive, covering the basics of a PC as well as more complicated subjects such as DOS commands and IRQ & DMA resources."

WHAT PC?

MACMIN TECHNICAL TRAINING LTD.
 'TRAINING TOMORROW'S TECHNICIANS TODAY'

Satisfaction Guaranteed

Examine any Macmin pack for 30 days in the comfort of your own home. If you are not delighted simply return in good condition for your refund.

Ask for **FREE info pack or just order:** Macmin Technical Training Ltd. Dept. PCW18, Windsor House, Greville Road, Bristol BS3 1LE.

Phone 07000 12 00 12 Fax: 0117 90 200 81 E-mail: dept.pcw18@macmin.co.uk Website: www.macmin.co.uk

INTERNATIONAL ORDERS: Rates on order form are U. K. first class. Europe & Eire Swiftair for A+ add £20 (total £29.99) for MCSE add £70.00 (total £104.99). Rest of world Swiftair for A+ add £30 (total £39.99) for MCSE add £105.00 (total £139.99). Payment as Sterling drawn on a U. K. bank or a Sterling Eurocheque.

Prices correct at time of going to press. Due to our policy of continual product improvement prices and specifications are subject to change without notice. E&OE Free gifts may be substituted with equivalent or better, subject to availability.



Please circle card type Credit & Debit cards **NO** surcharge



Phone your order: 07000 12 00 12 or 0117 90 200 80 (ask for Dept. PCW18)

Description	Item Cost	No.	Cost
Pro A+ Certified Course. Advance pay for 10 modules	£199.90		
Pro A+ Certified Course - 1st of 10 instalments	£24.99		
P&P deal for all 10 A+ Modules	£9.99		
Pay In advance for all 7 MCSE Exam Study Courses	£699.90		
MCSE Exam Study Course - 1 of 7	£124.99	£124.99	
P&P deal for all 7 MCSE Exam Study Courses	£34.99		
Digital Multi-meter (FREE with a Course)	(Tick)		
25 Piece Toolkit (FREE with a Course)	(Tick)		
Pay Just £9.99 Extra and receive both gifts	Great Deal	£9.99	
Any extra overseas postage (see above)			
TOTAL			

Name _____

Address _____

Postcode _____

Telephone _____

Card details or cheques/POs payable to Macmin Technical Training Ltd.

Switch or Card No. _____

Issue No. (Switch only) _____ Expiry date _____

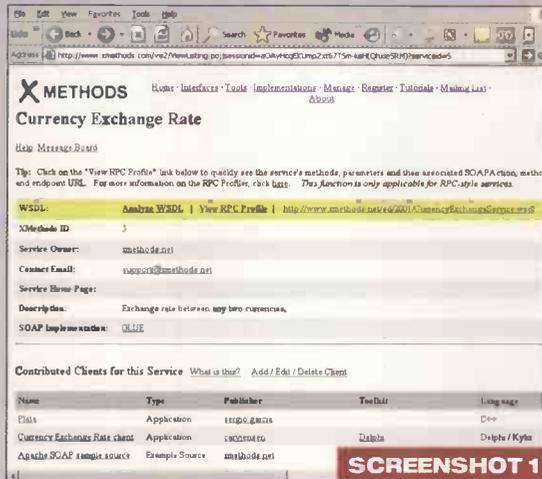
Signed _____

On the money

Tim Anderson builds a web service with Jbuilder and Visual Studio.Net to keep up with exchange rates

Early versions of the Windows CD player applet were simple affairs. Pop in a CD, and the applet would display 'Unknown CD' along with a list of tracks entitled track 1, track 2 and so on. There was an option to edit the details so the CD player would recognise it next time, but it was tedious and many people did not bother. In 1995, programmer Ti Kan set up the CDDB, an online database of CDs and their tracklists. Instead of millions of individuals typing in ragged little databases on their own PCs, CDDB created a central database that everyone could update and access. Playing a CD in the Windows CD player, and others like Real Jukebox and Music Match Jukebox, is now more rewarding. The title and track list comes up automatically; if I'm lucky a bitmap of the cover displays; and a few clicks will take me to reviews, artist biography, and so on. Of course CDDB got commercialised (see www.freedb.org for an alternative), Windows Media Player uses AMG's database, and so on, but I mention it because these CD databases are classic examples of web services. They are local applications that access the Internet programmatically, handling the user interface and data presentation without recourse to a web browser.

Within the past year or so, it has become easier for developers to build applications that create and consume web services. The chief enabling technology is Soap, which used to stand for Simple Object Access Protocol, but now according to the W3C (World Wide Web Consortium) is just Soap, since it does not require objects nor is it always simple. Soap is an XML specification that works over HTTP, so that if your clients can browse the web, they can also access Soap web services. Specific development tools include the Soap Toolkit for Visual Basic 6.0, Borland products such as Delphi, Kylix and Jbuilder, Microsoft's Visual Studio .Net, Apache Soap, and Perl's Soap Lite. These tools and libraries handle the low-level plumbing, leaving you to work out the implementation of your client or server. Interoperability between different implementations is an issue, but one that will improve. Leading vendors have established the Web Services Interoperability Organisation (www.ws-i.org) to develop tests and



SCREENSHOT 1

guidelines that will make the different platforms work together.

Using Soap

It is one thing to have the technology in place, another to put it to good use. For small businesses or hobbyists, the most likely use of web services is in client applications. The idea is to enhance an application by including up-to-the-minute data, access to a specialist database, or other functionality that cannot easily be achieved locally. The problem currently is that there isn't a great range of enticing services on offer. If you look down the list at www.xmethods.com (see screenshot 1), you will find a few obvious things such as weather reports, parcel tracking and stock quotes, a few online games, currency converters and so on, but nothing that suggests a major revolution in programming. These web services are fun to try, but not yet a great advertisement for the technology.

The potential for interesting business-to-business applications is much greater. You won't see these listed at Xmethods.com, but there is an obvious place for applications that can query stock levels, place orders, request quotes, or subscribe to other services such as customer credit checks. In theory, Soap can easily bridge platforms, so that Java on Unix can speak to Visual Basic or C++ on Windows, without the need for expensive middleware.

Soap can also be useful on internal networks of any size, particularly where you want to bridge languages or platforms. For example, perhaps you have a web application running on Linux, and

would like to integrate it with an older Windows VB application on another server. Using the Soap toolkit for VB, you could create a Soap API for the older application and access it from the Linux web application using Apache Soap, Perl or Jbuilder.

An example Soap client

To try out a live web service, I selected the CurrencyExchangeRate from Xmethods. This gets the exchange rate between any two currencies, and is implemented in Glue, a Java product from The Mind Electric (www.themindelectric.com). The Xmethods reference page conveniently describes the service, gives the URL for the .wsdl description file that tells clients how to call the service, and offers a few added resources such as a message board and an example client, in this case written in Delphi. Here's how I created a web service client, first with Jbuilder, and then with Visual Studio.Net.

Using Jbuilder

Jbuilder 6.0 has a Web Services Kit which is available for download from Borland's website. This is a preview release and currently requires Jbuilder Enterprise, which can also be downloaded in trial form. It is likely to be integrated with future versions of Jbuilder. After installing the kit, I created a new project, and then added a new application. I added labels, text boxes, combo boxes and a button to create a simple user interface for currency conversion. I've used XYlayout for simplicity, although for a resizable cross-platform application it is best avoided. This particular web service accepts country names, rather than currencies themselves, and the list of supported countries is given in the web service description. Hundreds are listed, but for this test I limited them to just three, populating the combo boxes accordingly:

```
String[] Countries = {
    "united states",
    "united kingdom",
    "Euro"};
JComboBox cboFrom =
    new JComboBox(Countries);
```

(Key: *✓* code string continues)

Next, I downloaded CurrencyExchangeService.wsdl from Xmethods.com. I then used the Import WSDL wizard to generate classes for the CurrencyExchangeService.



Above: Adding a web reference in Visual Studio.Net

The reason I downloaded the WSDL file, rather than simply giving Jbuilder the URL, is that I connect through a proxy server. The wizard generates five Java classes, including CurrencyExchangeBindingStub.java. This class gives access to the methods of the web service.

In order to use it, I opened up the source for Frame1, the application window, and added a couple of import statements:

```
import net.xmethods.www.*;
import java.net.*;
import java.text.*;
```

The first of these is the package name generated by the Import WSDL wizard, derived from the specific WSDL file used. Next, I added some code to the application constructor to configure the proxy server:

```
//Connect through proxy server
System.getProperties().put("http.proxySet", "true");
System.getProperties().put("http.proxyHost", "192.168.255.100");
System.getProperties().put("http.proxyPort", "4480");
```

The actual values here will depend on what proxy server you use; if you do not use a proxy server the code is not necessary. Finally, I added code to invoke the web service, in the ActionPerformed event handler for the button (see figure 1.1). Note that the URL which is passed to the stub object's constructor is the 'endpoint', the target address of the Soap invocation. You can read this from the WSDL file as the location attribute of the <soap:address> element.

I then ran the application, which works fine. The only disappointing aspect was the speed: around three seconds. Still,

Above: This VB.Net application works well, showing that interoperability is not altogether a myth



Fig 1

1.1 Invoking the Jbuilder web service

```
void jbConvert_actionPerformed(ActionEvent e) {
    try {
        //instantiate web service stub
        CurrencyExchangeBindingStub stub = new
        CurrencyExchangeBindingStub
        (new URL("http://services.xmethods.net:80/soap"));
        //get the rate between selected currencies
        float fRate = stub.getRate((String)cboFromCurrency.get
        SelectedItem(),(String)cboToCurrency.getSelectedItem());

        //display it
        jtRate.setText(String.valueOf(fRate));

        //display the resulting currency value
        float resultValue = Float.valueOf
        (jtFromValue.getText()).floatValue() * fRate;
        DecimalFormat df=new DecimalFormat("0.00");
        jtResultValue.setText(df.format(resultValue));
    }

    catch (Exception exc) {
        exc.printStackTrace();
    }
}
```

1.2 Code for Convert button

```
Private Sub cbConvert_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles cbConvert.Click
Try
' instantiate the web service object
Dim converter As New net.xmethods.
www.CurrencyExchangeService()
Dim fromValue As Double = Val(txtFromValue.Text)

'get the rate
Dim rate As Double = converter.getRate(cboFromCountry.
Text, cboToCountry.Text)

'display the rate
txtRate.Text = rate.ToString("n5")

'calculate and display the result
txtResultValue.Text = (fromValue * rate).ToString("n2")
Catch exc As Exception
MsgBox(exc.Message)
End Try
End Sub
```

(Key: ✓ code string continues)

that is a lot quicker than firing up a web browser, navigating to a financial site, and doing the calculation yourself.

Using Visual Studio.Net

Unlike Jbuilder, Visual Studio.Net was designed for web services from the beginning. As a result, it is even easier to use. Here's how to build the currency converter in Visual Studio.Net.

First, I started a new VB Windows Form application, and designed a form similar to that used in Jbuilder, adding the country names to the combo boxes from the properties editor. Next, from the Project menu, I chose Add Web Reference. In the address bar I entered: `www.xmethods.net/sd/2001/CurrencyExchangeService.wsdl`

Visual Studio.Net conveniently uses the same proxy settings as Internet Explorer,

so it could find the .wsdl file on the net (see screenshot 2). Then I clicked Add reference to add it to the current project. Visual Studio generated a CurrencyExchangeService class. The code for the Convert button is shown in figure 1.2 (see screenshot 3).

The application worked first time. Even though the CurrencyExchangeService is implemented in Java, it is if anything a little easier to create the client in Visual Studio.Net than in Jbuilder.

CONTACTS

Tim Anderson welcomes your comments on the Visual Programming column. Contact him via the PCW editorial office or email: visual@pcw.co.uk. Please do not send unsolicited file attachments. Examples from this column are posted at www.itwritting.co.uk/pcw.



CHAMPAGNE

CHAMPAGNE

Celebrating the Intel® 845G Chipset with Intel® Extreme Graphics



To date, over 100 million PCs have been sold with the Intel® integrated graphics solutions making Intel® the leading provider of graphics solutions in the history of the PC. Intel has used this expertise to design and deliver the next generation of integrated graphics technology, Intel® Extreme Graphics.

The new Intel® 845G Chipset with Intel® Extreme Graphics was uniquely designed to complement the capabilities of the Intel Pentium® 4 processor providing a rich visual experience for all of your entertainment and multimedia applications. It also enables Hi-Speed USB 2.0, providing up to 40 times faster downloading capability than the previous generation.



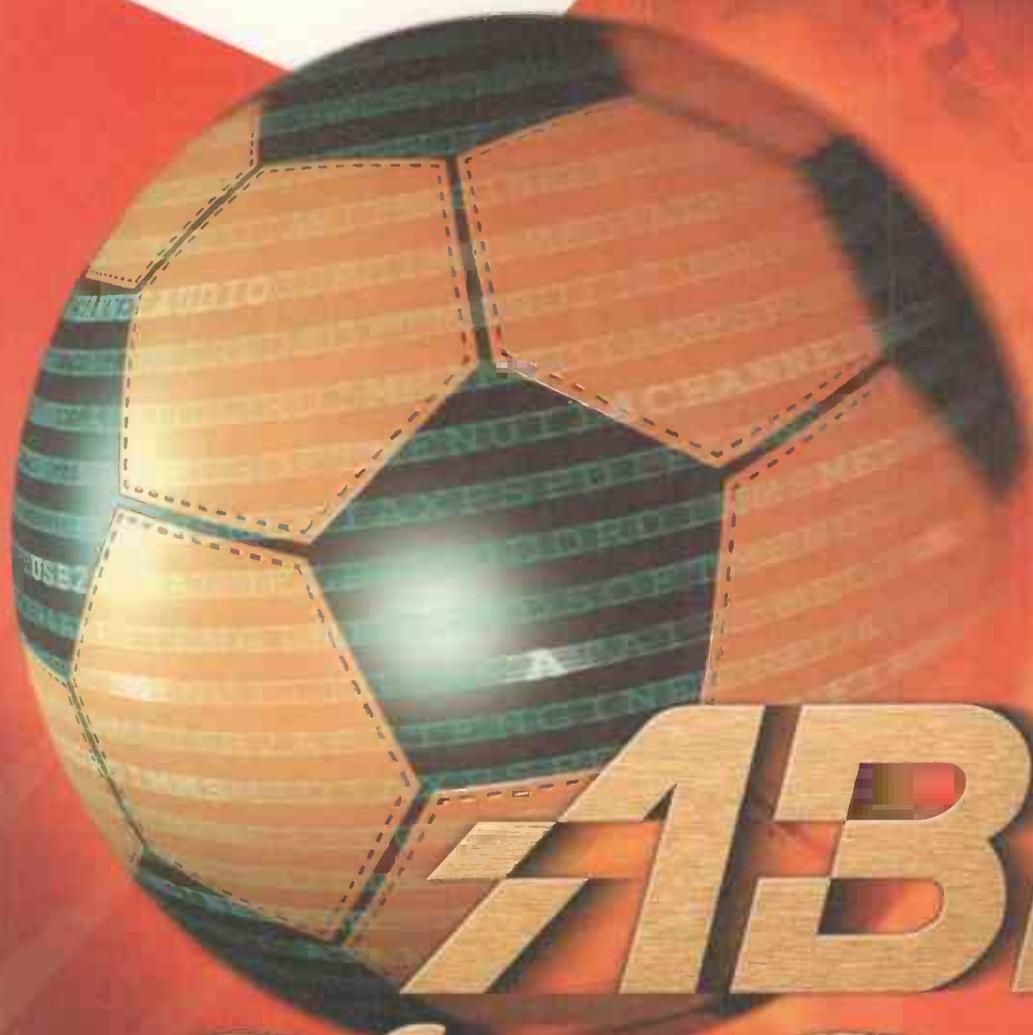
The Intel® 845G chipset enables ultimate flexibility with support for the amazingly fast 533MHz system bus. The Intel® 845G chipset ensures that tomorrow's most advanced applications will run best on Pentium 4 processor platforms.



Motherboard Selector Guide: <http://www.intel.com/go/boards/>

ABIT

Your Reliable Partner
www.abit.com.tw



ABIT G for Goals!

*With Intel® Extreme Graphics on the BG7,
you don't need a separate graphic solution to score.*



Intel® Application
Accelerator Support

Visit us at COMPUTEX TAIPEI 2002, Booth No. T201B(3)



MOTHERBOARDS | ADD-ON CARDS | CASES | CD/CD-RW/DVD DRIVES

Intel® 845G

CHIPSET

With Intel® Extreme Graphics

Support Intel® Application Accelerator

POWER UP

With Intel® Pentium® 4 Processor

Support DDR



AX4G Pro

- Supports 400 /533 MHz FSB for Intel® Pentium® 4 Processor Socket 478 up to 2.66G MHz
- Intel® 845G chipset "Intel® Extreme Graphics"
- 3* DDR Sockets up to max 2GB
- USB2.0 Ports *6 (2 rear; 4 via USB Cable/upgrade optional)
- ALC650 Code (support 5.1 channel)
- Ultra DMA66/100/133 HDD
- 1*CNR slot + 5*PCI slots + 1* AGP slot
- Supports AGP Protection Technology

For the complete details, visit :
www.AOpen.com



AVNET / 0129 6737957
CMS / 0151 7090900
MITEK / 01782 566600

AOpen®
Solutions · Components

Power 4 the Next Generation

audio
video
gaming

More Features More Performance More Fun

The Immaculate Intel® Pentium® 4 Processor based Motherboard

Finally there's a motherboard that gives you everything you need to take computing to the next level. The ASUS® P4B533-V with Intel® 845G chipset delivers everything from Intel® Extreme Graphics for gaming right out of the box, 533MHz front-side-bus support for enhanced performance, USB 2.0 for ultra-fast connectivity, Intel® Application Accelerator support and a wealth of special features to maximize the value of your Pentium 4 processor.



P4B533-V

- support Intel® Pentium® 4 533/400MHz FSB Processor
- Intel® 845G chipset
- 3 * DDR DIMM Sockets support max. 2GB memory
- 6-channel 3D hardware PCI Audio (optional)
- Intel® 100/10 Mbps Ethernet LAN (optional)
- 6 * USB 2.0 ports
- Intel® Extreme Graphics
- ATX



Where to Buy

* Motherboard may not be exactly as shown. Please confirm specifications with your dealer prior to purchase.

[BUY ONLINE]

Dabs.com	www.dabs.com
E-BUYER UK LTD	www.ebuyer.com
Ideal Computing	www.idealcomputing.co.uk
Insight Direct	www.insight.com.uk
Micro Direct	www.microdirect.co.uk
Scan Computers	www.scan.co.uk
Simply	www.simply.co.uk

[Retail Shop]

Alfa T/A Visioncase	01204 848 848
MIDLAND COMPUTER EXCHANGE	01212 464 666
NCS LIMITED	01214 721 082

AJM TECHNOLOGY LTD	01215 236 711
EUPA LTD	01218 431 230
Ideal Technologies	01215 614 477
NETHIGHSTREET.COM	01217 533 487
FUTURE SCOPE DISTRIBUTOR LTD	01217 712 502
MAPLIN ELECTRONICS PLC	01226 751 155
EDR Limited	01245 266 073
3D COMPUTER SYSTEMS LTD	01249 460 786
Upgrade Options	01252 339 714
VCI Computers Ltd	01268 414 159
CCL LTD	01274 471 208
SPECIAL RESERVE	01279 322 779
Upgrade Options	01292 290 909
Kustom PC's	01274 471 208
CCL LTD	01274 471 208

SPECIAL RESERVE	01279 322 779
Kustom PC's	01292 290 909
Brighthouse Computer Centre	01484 402 030
Computer Plus Limited	01517 089 184
PLANET MICRO LTD	01612 053 555
ARIA TECHNOLOGY	01612 252 277
AA Computer Centre	01618 359 434
Sphinx Computers	01777 860 171
Zac's Computers	01903 217 000
Paradigm Computers Ltd	01912 327 767
MICROSTAR COMPUTER SERVICES	01915 673 506
COMPUTER EXCHANGE LTD	01923 221 669
Axia Computer Systems Ltd	01923 333 111
Hollibay Consultancy Services	01943 600 993

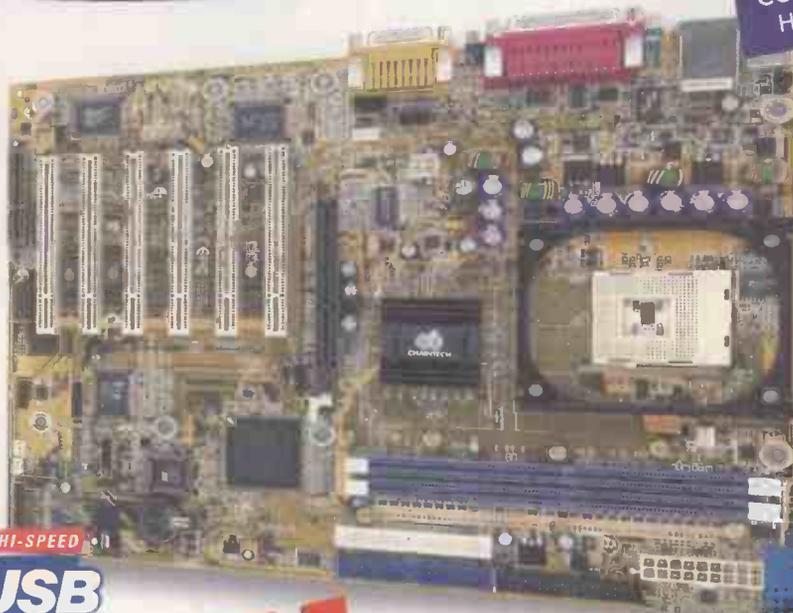
Arana QS Ltd	02072 371 415
Computashop Limited	02072 553 255
Stones Traders (T/A Epsilon)	02074 368 993
B.V Computers	02085 713 377
Telemart Systems	02085 741 293
IT Rescue	02088 519 228
Omnia Business Centre	02882 246 186
Watford Electronics	08702 200 700
Strak Trading	08704 444 484
Intermediates the Special Reserve	08707 259 999
CITY COMPUTER SYSTEMS LTD	08700 114 321
ECLIPSE COMPUTER SUPPLIES LTD	08707 439 000





Let's fly!

See us at
COMPUTEX TAIPEI 2002
Hall 2 E119,E120,E121



9BJF **NEW**

Intel® 845G
CHIPSET
With Intel®
Extreme Graphics

- Intel® Pentium® 4 Processor (Socket 478) • System clock supports 400/533 MHz
- Intel® 845G + ICH4 Chipset • Two 184 pin DDR DIMM up to 2GB
- On-board audio 8738 AC'97 CODEC 6 Channel speaker audio support
- Featuring Intel® Extreme Graphics • AGP 4x - 6 PCI - 1CNR
- Support Intel® Application Accelerator • LAN onboard 10/100Mbs
- 2x USB 2.0

Scan International
VIP Computers
Watford Electronics

Tel: 08707554788
Tel: 01618776222
Tel: 0800 7811010

trade@scan.co.uk
custserv@vip-computers.co.uk
sales@watford.co.uk

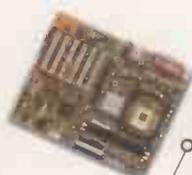


CHAINTECH
www.chaintech.com.tw

DFI®

www.dfi.com

Experience Pure Performance



NB76-EA



Intel® 845G / Socket 478 / ATX

- Support 400/533FSB Intel® Pentium® 4 Processors
- Intel® 845G chipset
- Support Intel® Application Accelerator (IAA)
- Support (PC1600) DDR200/(PC2100) DDR266
- Onboard Intel® Extreme Graphics and 1 AGP 2x/4x 1.5V port
- Intel® Extreme Graphics with Zone Rendering
- 6-Channel audio output; S/PDIF-in/out interface
- Support Smart card, MS, SD readers / 6 USB1.1/2.0 ports
- LAN onboard



NB76-EC



Intel® 845G / Socket 478 / ATX

- Support 400/533FSB Intel® Pentium® 4 Processors
- Intel® 845G chipset
- Support Intel® Application Accelerator (IAA)
- Support (PC1600) DDR200/(PC2100) DDR266
- Onboard Intel® Extreme Graphics and 1 AGP 2x/4x 1.5V port
- Intel® Extreme Graphics with Zone Rendering
- 6-Channel audio output; S/PDIF-in/out interface
- Support USB1.1/2.0 ports



Computex Taipei
June 3-7, 2002
TICC 204

ebuyer.com
make the right decision
<http://www.e-buyer.com>

Northamber
Tel: 0208 4017777

R.A.P.I.D.
Tel: 0870 6070100

All product names mentioned and all brand names are registered trademarks of their respective companies.

EPoX START YOUR PLENTIFUL LIFE!

Intel® 845G
CHIPSET
With Intel®
Extreme Graphics

Intel® 845G
CHIPSET
With Intel®
Extreme Graphics

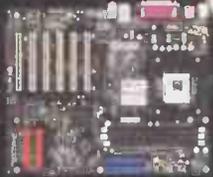
Intel® 845G
CHIPSET
With Intel®
Extreme Graphics



COMPUTEX TAIPEI
June 3-7
Hall 2
E64-E66
E87-E89

EP-4G4A/4G4AI/4G4AP/ 4G4AN/4G4AR/4G4A+

EP-4G4M/4G4M+



- Socket 478 for Intel® Pentium® 4 Processor support 533MHz FSB
- Supports Intel® Application Accelerator
- Intel® 845G Chipset (82845G+ICH4)
- Supports 3 PC2100 DDR SDRAM memory slots for up to 2GB total
- 6PCI, 1AGP(4X), 1CNR(Shared)
- Supports 2 IDE ports compatible with 2 PIO/Ultra DMA-100 devices each (Up to 4 devices total)
- Extra 2 IDE ports supplied with HPT372 controller supports Ultra DMA-133 (for EP-4G4AR/4G4A+)
- Built-in VGA with Intel® Extreme Graphics
- AC97 PCI-based sound(6CH Audio), 8USB2.0(2 Optional), 1R, 1S, PS/2 Keyboard and Mouse, audio I/O, and shared game/MIDI port
- Supports digital SPDIF
- 10/100Mb LAN connection (for EP-4G4AI/4G4AN/4G4A+)
- ATX Form Factor

Supports exclusive KBPO (Keyboard Power ON)
Supports Wake-On-LAN Function
Supports STR (Suspend To RAM) power saving Function
Supports CPU Fan and Clock Settings via BIOS
Supports AGP Voltage Setting via BIOS
Supports Memory Voltage Setting via jumper
Supports Asynchronous Transfer Mode between PCI & FSB
Post port onboard design with LED display (for EP-4G4AP/4G4AN/4G4AR/4G4A+)
Supports Magic Health and easy Boot
Supports AGP MASTER

- Socket 478 for Intel® Pentium® 4 Processor support 533MHz FSB
- Supports Intel® Application Accelerator
- Intel® 845G Chipset (82845G+ICH4)
- Supports 2 PC2100 DDR SDRAM memory slots for up to 2GB total
- 3PCI, 1AGP(4X), 1CNR(Shared)
- Supports 2 IDE ports compatible with 2 PIO/Ultra DMA-100 devices each (Up to 4 devices total)
- Built-in VGA with Intel® Extreme Graphics
- AC97 PCI-based sound, 6USB2.0(4 Optional), 1R, 1S, PS/2 Keyboard and Mouse, audio I/O, and shared game/MIDI port
- 10/100Mb LAN connection (for EP-4G4M+)
- Micro-ATX Form Factor

Supports exclusive KBPO (Keyboard Power ON)
Supports Wake-On-LAN Function
Supports STR (Suspend To RAM) power saving Function
Supports CPU Clock Settings via BIOS
Supports Asynchronous Transfer Mode between PCI & FSB
Supports Magic Health and easy Boot



Realtime Distribution
Blackstone rd
Stukeley meadows Ind Est
Huntingdon
Cambs
PE29 6EF
Tel: 01480 435 881
Fax: 01480 411120
Email: sales@realtimeid.co.uk



Quantum Microponents Ltd Contact Details
Head Office: 143-149
Bispham Rd Southport
Merseyside PR8 7BL
Mainline Enquiries: 0870 241 7392
Tel: 01704 506030
Cannock Tel: 01543 500077
Northampton Tel: 01634 792999
London Tel: 0208 542 5889



ideal Hardware PLC
Fountain Court
Oak Lane
Chessington Surrey
KT9 1SJ
Tel: 0208 286 5090
Fax: 020 8286 5056
Web: www.ideal.co.uk
www.myboris.com



Micro Peripherals
Shorten Brook Way
Anham Bus Park
Altham
Accrington
Lancs BB5 5YJ
Tel: North: 01282 776 776
Tel: South: 01256 707070
Fax: 01282 770001
Web: www.micro-p.com



SCL (Southern Components LTD)
Unit 29 Red Lion Bus Cntr
Red Lion Rd
Surliton
Surrey
KT6 7QD
Tel: 0780 4 725 725
Web: www.scl-td.co.uk



EPoX

346, Chung San Rd., Sec. 2, 10F1., Chung Ho City,
Taipei Hsien 235 Taiwan R.O.C.

TEL: 886-2-2247 9888 FAX: 886-2-2247 7888 http://www.epox.com

Intel® 845G
CHIPSET
With Intel®
Extreme Graphics

F845MG

M A I N B O A R D



Micro-ATX form factor

Intel® 845G+ICH4 chipset

Support Intel® Pentium® 4 processor with 533MHz system bus

Support maximum 2GB DDR266 SDRAM with 2 DIMMs

Support Intel® Application Accelerator

Support Intel® Extreme Graphics

Support one 1.5V AGP 2X/4X slot for AGP card add on

Support 3 PCI slots

Support 6 USB 2.0 ports



All brand names and trademarks are property of their owners.

Firstech Technolgoey Co., Ltd. TEL: 886-2-8797-5099 <http://www.foxtek.com.tw>

Breaking Through **FSB 533**

P4 Titan 845G/845E Series Motherboards

P4 Titan DDR Intel® 845G FSB 533

GA-8IGX Intel® 845G Chipset USB

- Socket 478 for new 0.13 micron-process Intel® Pentium® 4 processor
- Intel® Application Accelerator Support
- Provides 6 high speed USB2.0 connectors
- Intel® Extreme Graphics engine
- Integrated high quality 5.1 channel AC97 audio
- GIGABYTE patented DualBIOS™ technology
- Intel® PRO/100 VE Network Connection
- Round corner PCB plate design for better durability
- Rich in Overclocking features via BIOS setting
- Deliver excellent graphics performance with little Premium adder



Intel PRO Network Connection

P4 Titan DDR Intel® 845G FSB 533

GA-8IG Intel® 845G Chipset USB

- Socket 478 for new 0.13 micron-process Intel® Pentium® 4 processor
- Intel® Application Accelerator Support
- Provides 6 high speed USB2.0 connectors
- Intel® Extreme Graphics engine
- Integrated high quality 5.1 channel AC97 audio
- GIGABYTE unique EZ-Fix AGP slot
- Rich in Overclocking features via BIOS setting
- Round corner PCB plate design for better durability
- Deliver excellent graphics performance with little Premium adder

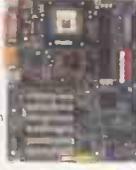


Intel PRO Network Connection

P4 Titan DDR Intel® 845G FSB 533

GA-8IGML-T Intel® 845G Chipset USB

- Socket 478 for new 0.13 micron-process Intel® Pentium® 4 processor
- Intel® Application Accelerator Support
- Supports FSB 533/400 MHz
- Provides 6 high speed USB 2.0
- Intel® Extreme Graphics engine
- Integrated Ethernet 10/100mb Network Connection
- GIGABYTE unique EZ-Fix AGP slot
- Integrated high quality 5.1-channel AC97 audio
- Deliver excellent graphics performance with little Premium adder



Intel PRO Network Connection

Award News



Taiwan Symbol of Excellence
1998-2002
5 years in a row

COMPUTEX TAIPEI June 3-7, 2002
See you at Hall 2
Booth no: E141-144,
1141-1144, 163-170

For more information, please call our resellers:

- | | | |
|--|--|---|
| A2Z computers
www.a2zcomputers.co.uk
Tel: 01509262636 | Insight Direct
www.uk.insight.com
Tel: 0870 7007374 | Micro Direct
www.microdirect.co.uk
Tel: 0161 2485050 |
| Dabs.com
www.dabs.com
Tel: 0870 1293724 | Jungle.com
www.jungle.com
Tel: 0870 7271771 | Scan
www.scan.co.uk
Tel: 0870 7554747 |



GIGABYTE™
TECHNOLOGY
G.B.T. TECH. CO. LTD. (U.K.)
http://www.gbt-tech.co.uk

* These speed settings are MSB guaranteed by GIGABYTE.
** The specifications and features are subject to change without notice.
*** All trademarks and logos are the properties of their respective holders.
**** Any benchmarking is at user's risk. GIGABYTE Technology shall not be responsible for any damage or liability to their processor, motherboard, or any other components.

Intel® 845G

CHIP

With Intel®
Extreme Graphics

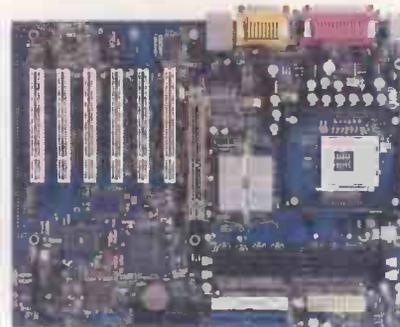
Featuring Intel®
Application Accelerator

Excellent Performance Outstanding Value

QDI PlatiniX 8-A

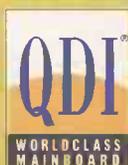
**Supports FSB 533MHz, USB 2.0
Integrates Intel® Extreme Graphics**

- **CPU:** Intel® Pentium® 4 Processor (478 pins)
- **Chipset:** Intel® 845G/ICH4 Chipset
- **FSB:** 533/400 MHz
- **Memory:** DDR266/200
- **Form Factor:** ATX/1AGP/6PCI
- **Onboard:** AC' 97 Audio
- **USB:** 6 USB 2.0 Ports
- **Graphics:** Integrates Intel® Extreme Graphics
- **QDI Innovations:** StepEasy II, LogoEasy II, RecoveryEasy II, SpeedEasy II, BootEasy, BIOS-ProtectEasy, Hardware Doctor, Triple Protection for CPU



Images may not represent exact product

QDI Computer (UK) LTD.
2/F, Seymour House, 186 High Street,
Slough, Berkshire SL1 1JS
Tel: (44) 1753 554004 Fax: (44) 1753 550885



www.qdigrp.com
www.qdieurope.com



MSI

845GIVE ME 533

533

MHz

PC2PC
Bluetooth

DDR

Intel LAN

Channel
AUDIO

HI-SPEED
CERTIFIED
USB

Intel® 845G
CHIPSET
With Intel®
Extreme Graphics

All-in-one
Solution



845G Max Intel® 845G chipset Socket 478

- Support Intel® Application Accelerator
- Support Intel® Pentium® 4 Processor up to 2.4GHz
- Intel® Extreme Graphics-- Intel® 845G chipset
- Intel® 845G platform provides excellent intergraded graphic solutions
- 3 DIMMs, up to 2GB of DDR 266(PC2100) Memory supported
- USB 2.0 Technology
- LAN on board---- Intel® 82562ET (Optional)
- Hardware monitoring function
- Suspend to RAM / Disk function
- AC'97 audio
- 6 PCI/1CNR/1AGP
- D-Bracket™ / Live update Series™ 2

USB 2.0

D Bracket2

Intel LAN

Live Update2

Channel



Link to the Future



845 Ultra-ARU BOS/V POWER REPORT Japan



845 Ultra PC001 Taiwan



845 Ultra Popular Computer News China



845 Ultra-ARU Noticias3D.com Spain



845 Ultra-ARU PC Magazin Germany



845 Ultra-ARU Love PC Korea



845 Ultra-ARU PCMag Korea



845 Ultra-ARU PCMag Turkey



845 Ultra PC Authority Australia



845 Ultra PC Authority Australia

Where to buy:

3D Computer Systems
01249 460766

CCL Computers
01247 471208

Dabs
www.dabs.com

Falcon Computers
0191 5676659

Insight
www.insight.co.uk

Micro Direct
www.microdirect.co.uk

Novatech
www.novatech.co.uk

Scan
www.scan.co.uk

Simply
www.simply.co.uk

Stak Trading
www.staktrading.com

Watford
www.watford.co.uk

VGI Computers
www.vgicomputers.com

COMPUTEX TAIPEI 2002
June 3-7
Visit us at
Booth NO. Hall2 F189

All functions above are optional for all of MSI products *MSI is a trademark of Micro-Star Int'l Co., Ltd. *The specification is subject to change without notice. * All brand names are registered trademarks of their respective owner. * Any configuration other than original product specification is not guaranteed.

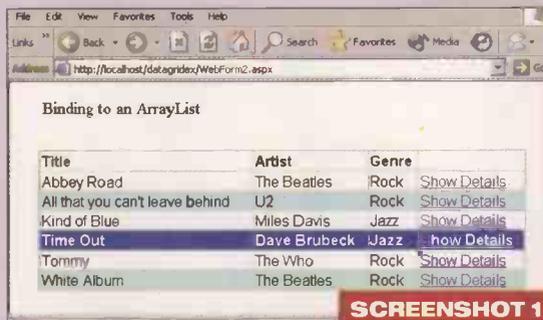
Defining data

Tim Anderson explores the options that Visual Basic .Net offers for creating DataGrids on the web

Grid controls have always been important to Rad (rapid application development) developers. From the earliest days of Visual Basic, third-party grid components have been among the most popular add-ons. The reason is that users find grids a flexible and intuitive means of browsing data. In the past, most grids have operated in either bound or unbound mode, with the unbound mode offering greater control at the expense of increased programming effort.

Visual Studio .Net offers two DataGrids, one for Windows forms and one for web forms. It does not have an unbound mode, but you do not have to bind to database tables. You can bind to any object that implements Systems.Collections.IEnumerable, such as an ArrayList. The ASP.Net DataGrid is true Rad for web developers, making it relatively easy to build web applications that display dynamic data. Here I'm going to show the basics of working with the DataGrid, and then show how to display master-detail data using two DataGrids on an ASP.Net page.

In this column I'm using Visual Basic for the language. Having just ploughed through a book that gave both Visual Basic and C# code for all its examples, I know how tedious this duplication is. It is easy to adapt from one language to the other, so I'll focus on Visual Basic alone.



SCREENSHOT 1

The customised grid looks better, but remains simple. Note the highlighted row to indicate a selection, in a similar style to Windows applications

DataGrid basics

As its name implies, the grid's Datasource property identifies the data to be displayed in the grid. This can be any .Net object that implements IEnumerable. Thus, the minimal code in figure 1.1 places data into an ASP.Net DataGrid.

Binding to an array is inflexible, but an ArrayList is a good choice if you don't need to connect to a Datasource. In figure 1.2 the PCWEx.CD class represents a music CD and has ID, Title, Artist and MusicGenre properties. I've not listed the code for this class, but there is nothing special about it. It has a constructor that takes Title, Artist and MusicGenre arguments to simplify its use. Genre is an enumerated type that can be set to Rock, Jazz or Classical (of course you could extend this). The code in figure 1.2 lists CDs in a DataGrid.

This results in a plain grid that displays the properties in the class, with the

property name becoming the column title. The MusicGenre property is not displayed, since columns are only generated for primitive, String, DateTime or Decimal types. Note that if ViewState is enabled (which is the default), then the DataGrid retains its contents if the page is reloaded, for example on form submission. Therefore, there is no need to repopulate it when IsPostBack is true. IsPostBack is an ASP.Net term for the process of reloading the same page, while making changes according to the user's actions.

It is easy to improve on this presentation. Working in the web form designer, right-click the DataGrid and choose Property Builder from the pop-up menu. I selected the Columns tab. First, I unchecked the option to Create columns automatically at run time. Next, I added three Bound columns, and entered values for Header Text and Data Field. In this case, the field names are the property names. Then I added a Button column of the Select type. On the Format tab, I increased the border width and set different colours for alternating and selected items.

Finally, I added a line of code to sort the ArrayList. Screenshot 1 shows the result. When the page first appears, no row is selected, but clicking Show Details causes the page to reload with the selected row highlighted.

Fig 1

1.1 Placing data into an ASP.Net DataGrid

```
Dim myArray() As String = {"One", "Two", "Three"}
DataGrid1.DataSource = myArray
DataGrid1.DataBind()
```

1.2 Listing CDs in a DataGrid

```
Imports DatagridEx.PCWEx
Private Sub Page_Load(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles MyBase.Load
If Not IsPostBack Then
BindTheData()
End If
End Sub
```

```
Private Sub BindTheData()
DataGrid1.DataSource = GetDataSource()
DataGrid1.DataBind()
End Sub
Private Function GetDataSource() As ICollection
Dim cdArrayList As New ArrayList()
```

```
cdArrayList.Add(New CD("Abbey Road", "The Beatles",
```

```
CD.Genre.Rock,1))
cdArrayList.Add(New CD("White Album", "The Beatles",
CD.Genre.Rock,2))
cdArrayList.Add(New CD("Kind of Blue", "Miles Davis",
CD.Genre.Jazz,3))
```

```
Return cdArrayList
End Function
```

1.3 Customising the DataGrid

```
Private Sub DataGrid1_ItemDataBound(ByVal sender As
Object, ByVal e As System.Web.UI.WebControls.
DataGridItemEventArgs) Handles DataGrid1.ItemDataBound
Dim itemType As ListItemType = e.Item.ItemType
If (itemType = ListItemType.Item) Or (itemType =
ListItemType.AlternatingItem) Or (itemType =
ListItemType.SelectedItem) Then
Dim thisCD As CD
thisCD = e.Item.DataItem
If thisCD.MusicGenre = CD.Genre.Jazz Then
e.Item.Font.Italic = True
End If
End If
End Sub
```

(Key: ✓ code string continues)

Changing appearance

A natural next step is to customise the appearance of grid rows according to their value. This is a great technique and has many applications, such as showing significant figures in bold or in different colours, or highlighting special offers, or amending data to expand abbreviations.

To put it to work, handle the DataGrid's ItemDataBound event. In Visual Studio, I selected the DataGrid in the left-hand dropdown in the code editor, and then ItemDataBound in the right-hand dropdown. For example, rather than showing the genre as a field, another possibility is to put Jazz titles in italics.

The code in figure 1.3 makes use of the DataItem, which is a reference to the object bound to this row of the DataGrid. This reference does not persist; the data is not cached in the DataGrid. It is intended for use while the DataGrid is being populated, so that you have access to the entire source object to make any desired modifications.

Including Images in rows

What if you wanted an image or a checkbox to render a field in the grid? You can do this with template columns. A template column lets you specify what controls to use to render the data. For this to work, you have to include a databinding expression in the page source. This appears within specific delimiters:

```
<# data-binding expression >
```

Databinding expressions are evaluated when DataBind() is called for the component. To illustrate template columns, the next idea is to have an image to represent the music type of each CD. There is one image for each of the values of CD.Genre: Jazz, Rock and Classical. To do this, I opened the Columns editor for the DataGrid and



added a bound column. Then I clicked 'Convert this column into a Template Column'. Looking at the HTML for the asp page, the column I just added appears like the code in figure 2.1.

The EditItemTemplate is not required at this stage, so this can be deleted. The ItemTemplate is set by default to a Label, and it is unbound. I need to change it to an Image, and add a binding expression to retrieve the correct image according to the current value of CD.MusicGenre. In preparation, I added the function in figure 2.2 to the code-behind page. Figure 2.3 shows the TemplateColumn element with the databinding expression added.

The DataBinder.Eval method takes a reference to the data container, and a reference to the required value. There is also an option to specify a string formatting expression. It simplifies code by letting you use a consistent syntax. However, you do not need to use DataBinder. Note that I've also added an ItemStyle-BackColor attribute to the asp:TemplateColumn, so that the image does not appear on a coloured background. This overrides the background colour for the row. The results are in screenshot 2, with images

Adding a template column lets you display bound data as images, or any control of your choice

in place in the grid. Using this technique, there are few limits on how you choose to present the data.

Show details

The Show Details column lets the user select a row, but currently does nothing more. The aim here is to show the tracks of each CD in a separate DataGrid, similar to a subform in an Access application. You can create an event handler for the button by selecting the ItemCommand event for the DataGrid in the Visual Basic editor. This takes a DataGridCommandEventArgs argument, from which you can get a reference to the currently selected DataGridItem. This has a Cells collection from which you can read the values in the selected row. It is no use inspecting the DataItem property, as this will be set to Nothing. Assuming you want to retrieve the primary key for the record, there are two obvious strategies. One is to include an ID column in the grid, with its visible property set to False. The other is to populate the grid's DataKeys collection. For example, you could add this line to the BindTheData routine, before calling DataBind:

```
DataGrid1.DataKeyField = "Id"
```

Now you can retrieve the ID value in the ItemCommand handler:

```
currentID = DataGrid1.DataKeys(e.Item.ItemIndex)
```

In order to put this to work, I amended the code to connect to an SQL Server database, rather than binding to an ArrayList.

Binding to SQL Server

The starting point for data access is the connection. SQL Server is a secure database, with support for two authentication models. SQL Server security employs a user name and password unique

Fig 2

2.1 HTML for a Template column

```
<asp:TemplateColumn HeaderText="Type">
  <ItemTemplate>
    <asp:Label runat="server"></asp:Label>
  </ItemTemplate>
  <EditItemTemplate>
    <asp:TextBox runat="server"></asp:TextBox>
  </EditItemTemplate>
</asp:TemplateColumn>
</Columns>
```

2.2 Adding a function to the code

```
Public Function GetImage(ByVal GenreVal As CD.Genre) As String
  If GenreVal = CD.Genre.Jazz Then
    GetImage = "images/trumpet.gif"
  ElseIf GenreVal = CD.Genre.Rock Then
```

```
    GetImage = "images/guitar.gif"
  ElseIf GenreVal = CD.Genre.Rock Then
    GetImage = "images/violin.gif"
  End If
End Function
```

2.3 The Template column with Databinding expression added

```
<asp:TemplateColumn HeaderText="Type" ItemStyle-BackColor="White">
  <ItemTemplate>
    <asp:Image runat="server" Enabled="False" ImageUrl='<# GetImage(DataBinder.Eval(Container.DataItem, "MusicGenre")) >' >
  </asp:Image>
  </ItemTemplate>
</asp:TemplateColumn>
```

(Key: code string continues)



Fig 3

3.1 Binding to SQL Server

```
Function GetDataSource() As ICollection
Dim sConnection As String
Dim sSQL As String
Dim da As SqlDataAdapter
Dim ds As DataSet
Dim dt As DataTable

sConnection = "server=MYSERVER;initial
catalog=codelist;integrated security=SSPI"

sSQL = "Select titles.title, titles.musicgenre,
titles.ID, artists.artist"
sSQL &= " from titles,artists where titles.artistid =
artists.id"
sSQL &= " order by artists.artist, titles.title;"
'You can add search restrictions to this statement

da = New SqlDataAdapter(sSQL, sConnection)
ds = New DataSet()
da.Fill(ds, "CDTitles")
dt = ds.Tables(0)
Return dt.DefaultView
End Function
```

3.2 Retrieving child data

```
If e.Item.ItemIndex >= 0 Then
ShowTracks(DataGrid1.DataKeys(e.Item.ItemIndex),
e.Item.Cells(1).Text)
End If
```

3.3 A routine to display track titles

```
Private Sub ShowTracks(ByVal TitleID As Integer, ByVal
Title As String)
DataGrid2.DataSource = GetTrackData(TitleID)
DataGrid2.DataKeyField = "Id"
DataGrid2.Columns(0).HeaderText = "Tracks for: " + Title
DataGrid2.DataBind()
End Sub
```

3.4 The SQL for GetTrack Data

```
sSQL = "Select Tracks.Track, tracks.ID from tracks where"
sSQL &= " tracks.titleID = " & Str(TitleID)
sSQL &= " order by tracks.OrderNumber"
```

3.5 Displaying tracks automatically

```
Private Sub BindTheData()
DataGrid1.DataSource = GetDataSource()
DataGrid1.DataKeyField = "Id"
DataGrid1.DataBind()
```

```
If DataGrid1.DataKeys.Count > 0 Then
DataGrid1.Visible = True
DataGrid2.Visible = True
DataGrid1.SelectedIndex = 0
ShowTracks(DataGrid1.DataKeys(0),
DataGrid1.Items(0).Cells(1).Text)
Else
DataGrid1.Visible = False
DataGrid2.Visible = False
End If
```

End Sub

(Key: ✓ code string continues)

to SQL Server, while integrated Windows security uses the currently logged-on user. SQL Server security is straightforward: just supply the appropriate username and password. If you use integrated security, you need to give the ASP.Net account appropriate access (by default the account is MYSERVER\ASPNET), or else set up identity impersonation using the web.Config file in the web application's directory. After setting up the connection, I rewrote GetDataSource to something like that in figure 3.1.

Setting up paging

The code ran as before, except that the data is retrieved from SQL Server rather than from custom objects. However, if there are a lot of rows returned, the page is going to become unwieldy. There are two solutions for this. One is not to allow unrestricted queries that return hundreds or thousands of rows. The other is to turn on paging in the DataGrid. To do this, set the DataGrid's AllowPaging property to True, and the PageSize to something appropriate; I chose just six to keep things tidy. Finally, implement a handler for the DataGrid's PageIndexChanged event. The code is like this:

```
DataGrid1.CurrentPage
Index = e.NewPageIndex
BindTheData()
```

The grid's paging mechanism is effective, but not very sophisticated.



SCREENSHOT 3

The completed application, displayed in Netscape Navigator. To get the application working properly in older browsers, the default settings in Visual Studio.Net must be changed

It works by retrieving data from its Data-source, starting at an index derived from the CurrentPageIndex. There are two problems with this: First, if you are retrieving a lot of data, it is inefficient; most of the data you retrieve is never displayed. Second, if the data is changing, the paging system might get it wrong. For example: the first page is displayed with six records. Elsewhere, a user deletes one of these records. Now the web user pages forward. What was the seventh record is now the sixth and won't be displayed. If this might be a problem, look into the custom paging feature, which lets you write your own code to handle paging.

Retrieving child data

With the paged grid up and running, it is time to look again at the retrieval of child records. I placed a second DataGrid on the form, and set up a single column

bound to the Track field. Next, I put the code from figure 3.2 into the ItemCommand event handler. Figure 3.3 shows the routine to display the tracks.

There's no need to show the code for GetTrackData, since it is virtually the same as that for GetDataSource. Figure 3.4 shows the SQL. Finally, I fixed the data binding routine (figure 3.5) so that tracks would be displayed automatically for the first CD in the list. The DataGrids don't look good when there is no data to display, so this routine also makes them invisible if the query is empty.

Screenshot 3 shows the final result. I've used Netscape 4.x for this illustration, to show that it works on older browsers. In order to achieve browser compatibility, you need to set the Target schema accordingly in the project properties. For older browsers, positioning is done with tables rather than using styles.

CONTACTS

Examples from this month's column are available at www.itwriting.com/pcw. The code in figures 1, 2 and 3 are also on this month's cover disc.

Next month this column becomes the Web Development and Ecommerce column. Contact us via the PCW editorial office or email: webdev@pcw.co.uk. Please do not send unsolicited file attachments.

The final transaction

Nigel Whitfield looks back at some important developments and forward to a revamped ecommerce column

As Sid Vicious once said, and now the end is near. It is, in fact, the final curtain for *PCW's Hands On Ecommerce* column in its current incarnation, though not for our coverage of ecommerce.

This is the twenty-fourth column, so we've been going for two years, during which time I've looked at various aspects of ecommerce, including the procedures involved from a business point of view and the configuration and installation of ecommerce packages.

We've also touched on how to promote your site, the hurdles and hassles involved in taking certain types of payment, and the tips and tricks you'll need to get the most out of some of the software that's been featured.

You'll be glad to know that ecommerce isn't going away completely; from next month's issue of *PCW* there'll be a Web Development and Ecommerce column, where we'll tackle both issues, so you can be sure we'll continue to look at how you can put your business online and make it attractive to potential customers.

Looking back

So over the past two years, what have been the most significant developments in ecommerce, and which issues have elicited the greatest response?

One of the most interesting areas, not surprisingly, is how to set up your own online shopping system, and we've covered some of the alternatives. Some of them, in fact, don't even involve you doing anything other than setting up a site full of links – why not take the route of many others and affiliate with a giant such as Amazon, creating a virtual shop that still pays you commission?

You can always look at selling your products through someone else's online shop, too, but then, of course, you'll almost certainly be looking at paying a commission on the sales – and some of the 'online mall' type stores charge quite a lot.

It's far better, then, to set up your own shop if at all possible, and there are a number of different ways to do it. You could use a system like World Pay's Click And Build, for example, which allows you to design an online shop simply by filling in a series of web forms, choosing templates and uploading

Right: Design an online shop with Click and Build

Below: OSCommerce is a major project to undertake



information about products, including pictures, to the Click And Build site (www.clickandbuild.com).

The advantage of this is that you won't have to worry about the technical side of things. As long as you can follow a walkthrough, and fill in the forms properly, you'll be up and running fairly quickly. The World Pay solution also includes a bureau option, for those who aren't set up to deal with credit cards, or don't want to jump through the hoops that banks insist on for those who want to do online transactions.

Off the shelf

If you want something more than the options provided by Click And Build, we've looked at dedicated ecommerce packages, including Actinic's Catalog (www.actinlc.com), which you can run on your PC, with a self-installing set of scripts to add a secure shopping basket to your web server, and OSCommerce (www.oscommerce.com), formerly known as The Exchange Project (TEP).

Both are quite different approaches. Catalog is very powerful and flexible, but you still don't need to know anything about how your web server works to add it to your site.

OSCommerce, by contrast, is a major undertaking. While you can get it running without knowing too much, you will require a lot more knowledge of things under the hood to make the most of it – and it provides a lot of opportunities for customisation.

There's also Shop @ssistant at www.floyd.co.uk, which is perhaps a middle way – you can add it to your site with a few drag and drop movements in Dreamweaver, but you'll have to get your hands dirty to fine tune the configuration, as we saw in the November 2000 issue.

And for the diehards who want to go it alone, we've gone further under the hood over the past two years, looking at how you could start to roll your own ecommerce solution, and housekeeping tasks such as securing parts of your site, and installing secure certificates to protect transaction data as it passes over the Internet.

We've also seen how you can track visitors as they move around your site, to help find out if positioning a product on the front page, for example, increases sales.

More than just shops

But the ecommerce column has been about more than just setting up a

commerce package. We've looked at some of the other aspects of getting up and running too.

One that's common to every type of shop is getting your catalogue of products online. Filling in a web form or a page in a sales application, such as Catalog, for each one can be laborious, and since you already probably have the data in a database or spreadsheet, it makes sense to use that file and automate the process.

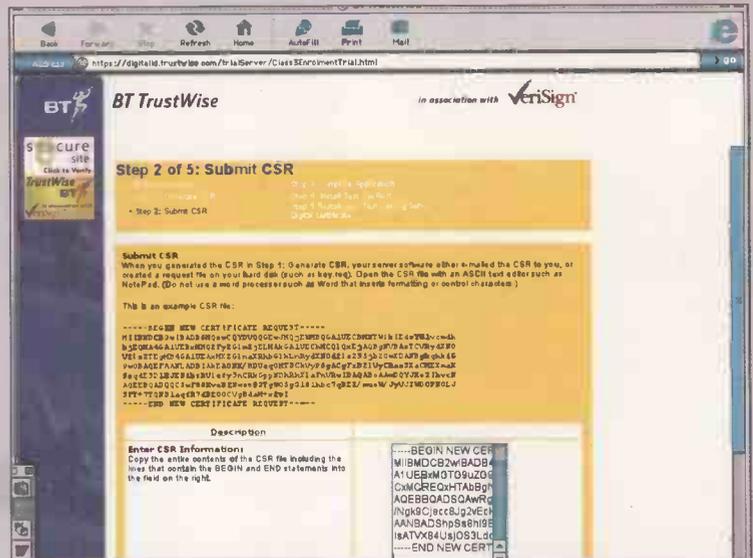
We've covered that problem for a number of different systems, with plenty of tips and tricks that should make it easier for you to transfer all your products online without having to spend ages slaving over a browser rekeying information you already have.

There are other considerations, too, besides the purely technical. And ecommerce itself isn't necessarily just about selling things online.

One of the current Government's stated aims is that a large proportion of our transactions with it should be possible online. For many businesses, one of the most important of those is filing your VAT return, something that is now possible via the Government gateway. You might find, however, that doing so isn't quite such plain sailing as the officials might have you believe.

Marketing is another big problem. Just how do you get people to visit your online store? Direct email is one

We've covered Information such as securing parts of your site and installing secure certificates



solution, but one that I'd certainly discourage and, despite some of this column's correspondents saying 'How else do we promote our business?' I don't think I'll ever be persuaded that polluting the inboxes of people who haven't asked for your email creates a good impression.

As one reader who tried it found, it did little for his sales, but certainly ensured he received lots of junk in return.

And finally, there are the trials and tribulations of taking payment from people. Are your margins good enough to absorb the cost of processing credit

cards, especially if you have to use a bureau service? And what about other mechanisms, such as Paypal, or reverse billing via SMS?

Every method has its pros and cons, depending on what sort of business you're running, and who'll be buying from you. I hope that over the past two years, I've given many of you enough information to at least make you think about the best ways of approaching these problems.

Farewell

There is, of course, no one answer to anything, and there are plenty of different ways to approach ecommerce. Though this column may be ending, I'll still be delighted to hear from people with their views and ideas, though I can't promise a reply to everyone's email.

And in the context of both the Hands On Web Development and Ecommerce column and occasional features, PCW will still be looking at some of the issues affecting people who want to do business online.

I hope you've found this column as informative to read as I have to write and research it. Please join me over in the new Web Development and Ecommerce column in coming months.

Meanwhile, I'll be putting as many of the past ecommerce columns as I can together online at www.nigelwhitfield.com.

CONTACTS

Nigel Whitfield welcomes your comments on the new Web Development and Ecommerce column. Contact him via the PCW editorial office or email: webdev@pcw.co.uk. Please do not send unsolicited file attachments.

INDEX OF ECOMMERCE COLUMNS

Issue date	Subject covered
2000	August September October November December
2001	January February March April May June July August September October November December
2002	January February March April May June



The correct protocol

Roger Gann continues his look at TCP/IP with explanations of IP addresses and subnetting

Last month I began exploring the mysteries of the Transmission Control Protocol/Internet Protocol – TCP/IP to you and me. I'll conclude this month by looking at IP addresses and the vexed matter of subnetting.

So let's start with an easy one – what's an IP address? As we saw last month, it's a unique number used to identify a particular interface on a PC or other host. At the moment, an IPv4 address contains 32 bits of data, but if IPv6 becomes more widespread, then this will double to 64 bits. Thirty-two ones and zeros are less than memorable and so to make things more palatable to human eyes, IP addresses are normally rendered in a decimal notation that uses periods to separate each byte (more correctly, an 'octet'). For example, the IP address 00001010 00000000 00000000 00000001 is a lot easier to remember when expressed as 10.0.0.1. Which notation would you prefer?

So far so good. However, the IP address has to do two jobs – it has to indicate both the network and the host within the network. Back in the mists of techno-antiquity, it was imagined that eventually there would be lots of IP networks. Most would be small, and 24 bits could represent all the different IP networks. It was also felt that some very big networks might need 24 bits to represent all their hosts, which would lead to 48bit addresses. A compromise was therefore reached – 32 bits. Assuming that most networks would be small, the original TCP/IP specifiers set up different ranges or classes of IP address, where the values of the leftmost four bits of an address determine its class.

All 'Class A' addresses, for example, have the leftmost bit set to zero, thus: 0xxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx

Converting this template to decimal notation shows that Class A addresses



include all values in the range 0.0.0.0 to 127.255.255.255. Addresses beginning with 1 to 126 use only the first octet for the network number. Thus 24 bits are available for hosts. As you might imagine, few normal organisations qualified for a Class A address.

Class B addresses must have the leftmost bit set to one, and the next bit set to zero, but all other bits may vary. Thus network numbers are 128.1.x.x through to 191.254.x.x. Addresses commencing 127.x.x.x are avoided – these have a special use – for example the 'dummy' loop-back connector used for testing purposes is usually 127.0.0.1. The last two octets are available for host addresses, giving 16 bits of host address. This allows for 65,534 computers, which should be enough for most organisations.

The runt of the litter is the Class C address. Class C addresses use three octets, in the range 192.1.1 to 223.254.254. These allow only 254 hosts on each network, but there can be lots of these networks. Addresses above 223.x.x.x are reserved for future use – Class D has been pencilled in for multicasting, while Class E remains undefined. Table 1 (below) summarises the overall breakdown of all IP addresses into this class system.

Computing the required subnet mask for a given range of IP addresses is mind-boggling – it's easier to download the free IP Subnet Calculator from www.wildpackets.com/products/ipsubnetcalculator

Nearly all of the Class A and Class B IPv4 address domains have already been assigned to large organisations. Addresses in the Class D and E ranges have been reserved for special purposes by the IP administrative authorities. Effectively this leaves only the Class C address ranges available.

In any event, the class concept is now legacy terminology, superseded by CIDR – Classless Inter Domain Routing, effectively a type of subnetting. Network address classes failed to scale up with the size of the Internet. There were two problems with them. The first is that network address classes are not an efficient way to allocate IP addresses. A network of 12 workstations really doesn't need a class C network but had little choice, meaning the unused addresses in the class C went to waste.

Class A networks were far too large for anyone to justify needing the space, and were difficult to allocate. Class C networks were too small for most organisations. The most commonly requested size of network was the Class B network; so much so that there weren't enough to go around. When that happened, the authority responsible for allocation started forcing smaller organisations to apply for several class C networks rather than a class B network.

Since the result is neither one thing nor the other, in CIDR terminology, they're not called classes any more. Instead, the network number is quoted, followed by a / and then the number of bits that indicate the network.

An old class C, then, becomes a /24, for example 192.168.1.0/24. Four adjacent class-C style networks could be described as a /22. CIDR makes even smaller network allocations possible too – a /27 gives 32 addresses, for example, while a /28 gives 16. But to understand more, we need to look at netmasks and subnetting.

Subnets

Lans consist of individual segments of network cable. Gateway devices such as routers and bridges are used to link these segments together.

There are administrative reasons to want to partition a network as well, and it is possible to break a network down in to virtual network segments that partition

TABLE 1

IP ADDRESSES

Class	Leftmost bits	Start address	Finish address	Default mask
A	0xxx	0.0.0.0	127.255.255.255	255.0.0.0
B	10xx	128.0.0.0	191.255.255.255	255.255.0.0
C	110x	192.0.0.0	223.255.255.255	255.255.255.0
D	1110	224.0.0.0	239.255.255.255	N/A
E	1111	240.0.0.0	255.255.255.255	N/A

the traffic flowing through the cable rather than the cables themselves. These virtual segments are known as subnets.

Subnetting allows network administrators some flexibility in defining relationships among network hosts. Hosts on different subnets can only 'talk' to each other through gateway devices such as routers. The ability to filter traffic between subnets can make more bandwidth available to applications and can limit access in desirable ways. It can improve manageability, too: for any given /16 (class B) network, there are 65,534 usable addresses. This is usually way too many computers to have on any one physical segment of the Lan.

Subnet masks

Just like IP addresses, subnet masks contain 32 bits of data and usually appear in the same 'dotted decimal' notation. For example, a very common subnet mask in its binary representation: 11111111 11111111 11111111 00000000 will usually be shown in the equivalent, more human-readable form: 255.255.255.0

Applying a subnet mask to a full IP address has the effect of splitting it into two parts, an 'extended network address' and a host address. For a subnet mask to be valid, its leftmost bits must be set to one and its rightmost bits must be set to zero. Put simply, subnets take some of the bits that represent hosts and use them to represent a subnet instead.

Nowadays you'll often see addresses written in the form 192.168.1.13/25 to indicate that the address has a 25bit netmask. The concept of subnetting can be tricky to grasp. Let's say my company uses a private address network in the 192.168.1.x range for its internal hosts. It is a /24 (class C) network and its default subnet mask of 255.255.255.0 will allow all PCs to be peers on the network by default. But we don't want that as we'd like to keep the accounts and HR sections private. To subnet this network, more than 24 bits must be set to one on

A TWO-SUBNET NETWORK

Network address (24 bits)	Subnet number (1 bit)	Extended network	Host address range
11000000 10101000 00000001	0	192.168.1.0	192.168.1.1 – 192.168.1.127
11000000 10101000 00000001	1	192.168.1.128	192.168.1.129 – 192.168.1.255

```

C:\>ipconfig /all

Windows IP Configuration

Host Name . . . . . : althon-1000
Primary Dns Suffix . . . . . : smallbusiness.local
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  : 
   Description . . . . . : 3Com 3C9951X-based Ethernet Adapter
   (Generic) . . . . . : 
   Physical Address. . . . . : 00-60-97-01-C8-29
   Dhcp Enabled. . . . . : Yes
   Autoconfiguration Enabled . . . . . : Yes
   IP Address. . . . . : 10.0.0.11
   Subnet Mask . . . . . : 255.255.255.0
   Default Gateway . . . . . : 10.0.0.2
   DHCP Server . . . . . : 10.0.0.2
   Lease Obtained. . . . . : 23 March 2002 10:58:42
   Lease Expires . . . . . : 31 March 2002 10:58:42
    
```

IPConfig is a handy little command utility that sums up all your IP settings – Windows 9x users get the slightly sexier WinIPCFG

Windows XP users get a slightly prettier view of their IP settings if they check the Status of their Network Connection

the left side of the subnet mask. For instance, the 25bit mask 255.255.255.128 creates a two-subnet network as shown in table 2.

For every additional bit set to one in the mask, another bit becomes available in the subnet number to index additional subnets. A two-bit subnet number can support up to four subnets, a three-bit number supports up to eight, and so on.

Just as the netmask can be used to route information on your Lan, so it's now used in CIDR to specify routing over the Internet, helping to allocate addresses much more flexibly than in the past.

Special numbers

In TCP/IP-speak, 0 and 255 have special meanings. 0 is reserved for machines that don't know their address. In certain circumstances it is possible for a machine not to know the number of the network it is on, or even its own host address. For example, 0.0.0.23 would be a machine that knew it was host number 23, but didn't know on what network.

255 is used for 'broadcast'. A broadcast is a message that you want every system on the network to see. Broadcasts are used in some situations where you don't know who to talk to.

For example, if you need to look up a host name and get its Internet address; sometimes you don't know the address of the nearest name server. In that case, you might send the request as a broadcast.

In order to send a broadcast, you use an address that is made by using your network address, with all ones in the part of the address where the host number goes. For example, if you are on network 62.104.200, you would use 62.104.200.255 for broadcasts. For convenience, the TCP/IP standard also allows 255.255.255.255 to be used. This refers to all hosts on the local

network. It is often simpler to use 255.255.255.255 instead of finding out the network number for the local network and forming a broadcast address such as 62.104.200.255.

So, because 0 and 255 are used for unknown and broadcast addresses, normal hosts should never be given addresses containing 0 or 255 – which is why, as those adept at binary arithmetic will have noticed, a /16 network only gives you 65,534 host addresses and not 65,536. Addresses should never begin with 0, 127 or any number above 223.

Private number

Some TCP/IP networks are set up with the intent that they will never be connected to the global Internet. This type of network is usually referred to as a Private Network and they use 'private' IP addresses.

Some private networks are set up for security reasons and others simply because their purpose does not require Internet connectivity. The Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP addresses space for private Internets aka local networks, using the old class system:

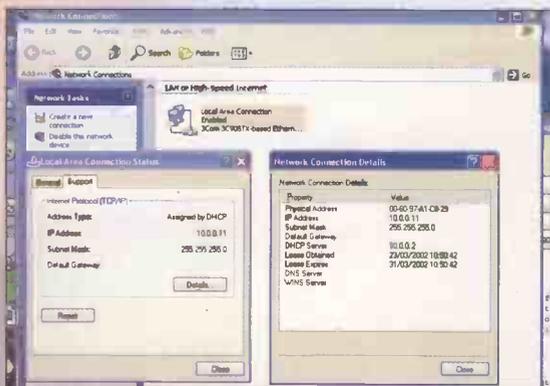
- Class A 10.0.0.0 – 10.255.255.255
- Class B 172.16.0.0 – 172.31.255.255
- Class C 192.168.0.0 – 192.168.255.255

As you see, you can have multiple class C networks with about 250 computers in each one. That allows you to have multiple sites with a coherent addressing scheme, especially if you take advantage of CIDR. Additionally, IP addresses in the range of 169.254.0.0 – 169.254.255.255 are reserved for Automatic Private IP Addressing (APIPA).

Needless to say, these are private (as opposed to public) IP addresses and so shouldn't be used on the Internet. And because they are not connected to the Internet, it means that private IP addresses can be reused (ie duplicated) by various networks.

CONTACTS

Roger Gann welcomes your comments on the Networks column. Contact him via the PCW editorial office or email: networks@pcw.co.uk. Please do not send unsolicited file attachments.



FREE UK carriage
on all online orders over £75 ex VAT (£88.12 inc VAT)
placed at...

www.dabs.com

**direct
FOCUS**



Buyer's Guide

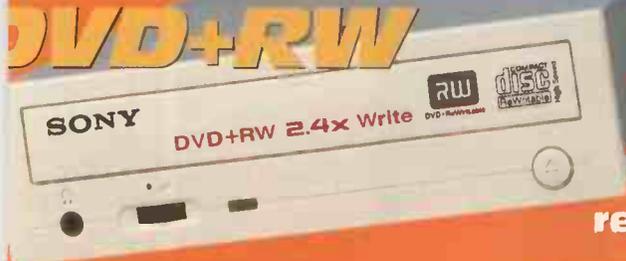
July 2002 edition

issue 85

**Superb value
all-in-one device!**

SONY

DRU-120A
DVD+RW



quicklink > 1YSRPW **Go**

only
£289
(£339.57)

NEW

**Combining
DVD+R/RW
& CD-R/RW
recording with
DVD-ROM &
CD-ROM playback.**

X writing speed for DVD+R/+RW discs
included software includes:

B's CLIP packet writing software for drag-and-drop data recording to DVD+RW and CD-RW B's
Recorder GOLD for all-purpose CD recording and DVD backup and data recording
Retrospect Express for back-up and disaster recovery
CyberLink's PowerDVD for DVD-Video and VideoCD playback
MusicMatch Jukebox for personalised music programming and playback
MedioStream's neoDVDstandard for creation of custom DVD-Video and Video CDs

also available: Sony DRX-120L DVD+RW External iLINK
£359 (£421.82) quicklink > 1YSSPW **Go**

visit: www.dabs.com/sony



**Get the
Pictures
you
really
want
or your
money
back!**

Purchase any HP Camera, Printer or
Scanner from the list below and if you are
not completely satisfied, HP will refund
your purchase.

cameras

318 Digital Camera	£145 (170.37)	quicklink > 118FPW
612 Digital Camera	£180 (211.50)	quicklink > 131FPW
715 Digital Camera	£265 (311.37)	quicklink > 114CPW
812 Digital Camera	£279 (327.82)	quicklink > 110CPW

printers

PhotoSmart P1000	£99 (116.32)	quicklink > 131FPW
PhotoSmart P1115	£138 (162.15)	quicklink > 131FPW
PhotoSmart P1215	£175 (205.62)	quicklink > 131FPW
PhotoSmart P1315	£229 (269.07)	quicklink > 131FPW

scanners

ScanJet 4470C	£89 (104.57)	quicklink > 110CPW
ScanJet 5470C	£160 (188.00)	quicklink > 110CPW

offer valid from
1st May until
15th June 2002



for full details visit: www.dabs.com/hp/trydigital



Official Sponsor

Official online sponsor of Starchaser Industries
www.dabs.com/starchaser

0%

online finance option

Available when you order over £500 of
equipment from dabs.com see page 2
www.dabs.com/finance

easy
on the
wallet

dabs.com

top ten deals



**NEW NINTENDO
GAMECUBE (BLACK) 1**
PowerPC 485MHz Processor 40MB RAM
£145 (£170.37 inc VAT)
quicklink > 17H6PW



**DABSVALUE
ADSL PCI 2**
Conexant Chipset Modem
£44 (£51.70 inc VAT)
quicklink > 14XCPW



**EPSON
STYLUS PHOTO 950 3**
PRINT Image matching enabled
£281 (£330.17 inc VAT)
quicklink > 1YRQPW



**CARDSCAN
EXECUTIVE 500/V6 4**
USB & Parallel Scanner
£149 (£175.07 inc VAT)
quicklink > 1YSPFW



**SHARP SL5500D
HANDHELD 5**
A new generation PDA
£379 (£445.32 inc VAT)
quicklink > 1Y13PW



**SONY DCR-TRV340
DIGITAL HANDYCAM 6**
25x Optical/700x Digital zoom
£479 (£562.82 inc VAT)
quicklink > 17YGPW



**SYMANTEC NORTON
GHOST 2002 7**
High performance utilities
£33 (£38.77 inc VAT)
quicklink > 10H8PW



**DABSVALUE 128MB
COMPACT FLASH 8**
For PDAs and Digital Cameras
£38 (£44.65 inc VAT)
quicklink > 11KCPW



**GARMIN
ETREX SUMMIT 9**
Inc. Barometric Altimeter
£165 (£193.87 inc VAT)
quicklink > 16BCPW



**DABSVALUE
15" TFT 10**
Lowest priced TFT
£249 (£292.57 inc VAT)
quicklink > 10G7PW

delivering technology

www.dabs.com

e-mail sales@dabs.com

choose from over 16,500 products

the UK's largest online IT reseller



0%

online finance option available now

www.dabs.com/finance

Available from dabs.com in conjunction with Halifax-Cetelem, Europe's leading consumer credit provider. Take up our 0% finance option, via the online acceptance, when you order over £500 of equipment from dabs.com

easy
on the
wallet

(This is an interest bearing personal loan with 36 monthly repayments @ 29.8% APR. Customers have an option to settle interest free within the first 10 months. Typical example: Cash Price: £999.00, 10% deposit: £99.90, Amount of loan: £899.10, Total charge for credit: £411.92, Balance payable: £1,311.02, Total amount payable: £1,410.92 36 monthly repayments of: £36.42, APR: 29.8%, Interest free option period first 10 months. Dabs are licensed credit brokers, credit is subject to status and written quotations are available on request. Payment Protection Insurance is available to those that apply)

Introduction.

Welcome to Issue 85 of Direct Focus, which as usual is packed full of great offers on a wide range of IT and technology products.

Don't forget, when you spend over £75 (excluding VAT) online at dabs.com, you'll get FREE delivery under our standard 1-3 day delivery scheme AND you can earn AIR MILES too, the world's number one loyalty award, provided you're registered under our dabspoints collection scheme.

Visit www.dabs.com/dabspoints today for details.

NEW: Pocket Dabs Download for Your Handheld Computer

Take dabs.com with you wherever you go with our special Pocket Dabs download, designed especially for use on your Pocket PC 2000 or 2002 handheld computer.

As one of the UK's most progressive online retailers, we're constantly developing tools to make dealing with dabs.com easier, and the launch of Pocket Dabs is yet another example of how we're pushing back the boundaries!

It's absolutely ideal for those who need to check prices and stock availability, or reference basic product information whilst they're out and about and can be downloaded FREE from the dabs.com website now! Visit www.dabs.com/products for details.

David Atherton

David Atherton,
Managing Director
dabs.com plc
datherton@dabs.com

LIFE® Professional Internet PC

• Install • Connect • Register
• Surf the Internet •

- Intel® Pentium® 4 Processor
- 16x DVD drive
- CD-ReWriter 32x12x48x
- nVidia GeForce 4MX420 64MB SDRAM
- 40GB Hard Disk
- 256MB DDRAM Memory
- IEEE 1394 FireWire
- AC 97 Sound on board
- 4 x USB
- 56K PCI v.90 Data-Fax Modem
- 3.5" Floppy Disk Drive
- Wheel Mouse incl. Pad
- OS/2 Keyboard with Multimedia Hotkeys



only
£637
(£748.47)

quicklink 1Y3KPW

Included Software

WIN DVD OEM version
Nero Burning ROM OEM version
Microsoft® Windows® XP

For more details please visit: www.dabs.com/life

Getting More From Your IT Purchases

At dabs.com, we always endeavour to bring you the very best value for money and work hard to find exclusive special offers. But in addition to enjoying our great prices, there's another way to get more from your IT purchases at dabs.com...

Introducing dabspoints

dabspoints are our way of saying thank you to our customers for choosing dabs.com. Every product in the Dabs portfolio, large or small, has a dabspoints value set against it, indeed some products even offer bonus dabspoints - look out for these when you're browsing our range. dabspoints are awarded at a rate of one dabspoints for every full pound* spent at dabs.com so the more you spend with us, the more dabspoints you'll accrue.

*dabspoints are calculated on each individual item, not overall order total

Redeeming your dabspoints

dabspoints can be redeemed in exchange for either AIR MILES, which in turn can buy you flights, mini-breaks and even fun days out, or a range of quality products from our new Dabs Merchandise Store. For more details on redemption, visit www.dab.com/dabspoints.

Who is Eligible to Collect dabspoints?

In a nutshell, any customer with an online credit/debit card account is eligible to collect dabspoints.

How Do I Register to Collect dabspoints?

It's easy and there's no time consuming registration process! To start accruing dabspoints immediately, just log into the dabs.com website and choose the 'Edit Preferences' option from the Account Administration menu. Then set the 'Accrue dabspoints' button to YES. And that's it!

AIR MILES and the Flying Boat logo are trademarks of AIR MILES International Holdings N.V. AIR MILES awards are held and issued for use subject to AIR MILES Customer and Booking Terms and Conditions

Contact information

Sales e-mail sales@dabs.com
Customer Support Centre e-mail cs@dabs.com
(Technical Support/Customer Services)

For contact numbers see
www.dabs.com/contactus
opening times please see
www.dabs.com/contactus/openingtimes.asp

Consumer Payment terms

Credit/Debit Card payments: We accept payment by VISA, MASTERCARD and Switch

Business Payment terms

Credit/Debit Card payments: We accept payment by VISA, MASTERCARD and Switch.
New Account Opening: Please call our business only sales team on 0870 129 3010 to arrange to open a credit account now (subject to status).
Business Leasing: We can offer very competitive rates on Business Leasing (subject to status) for companies.
Corporate Account Facilities: 14 day credit terms available to public sector & quoted PLCs.

Carriage charges for Phone, Fax, or Email orders

Phone/fax/email orders - Hardware/software (per order)		
Standard GB/N.Ireland/IOM	1-3 working days	£10.00 (£11.75)
	Next working day	£15.00 (£17.62)
All PC System deliveries		£20.00 (£23.50)
Channel Islands/Eire 1-3 days		£20.00 (£23.50)
Saturday (Malnland GB & N. Ireland)		£20.00 (£23.50)
Phone/fax/email orders - Small/Low cost items		
Standard UK 1-3 working days		£5.00 (£5.87)
Next working day		£7.50 (£8.81)

Carriage charges for online orders

UK internet orders via www.dabs.com*
UK Carriage 1-3 working days ... FREE
Orders under £75 ex VAT are subject to a small order surcharge ... £2.95 (£3.46)
*Only on purchases made over the internet at www.dabs.com, placed from and delivered to a UK postcode.

Other Information
PRICES ARE PER ORDER NOT PER BOX. Prices in brackets include VAT. All delivery times subject to cleared funds, being in stock and unsold. Call for quotes on other areas/times

Product News & Price Guide

©2002 dabs.com plc
Designed and produced by dabs.com plc
Direct House
Wingates Industrial Park
Westhoughton
Bolton
BL5 3XD
Directors: David Atherton; Simon Brayshaw; Dianne Dillon; Jonathan Wall; Helen Slinger
Product Marketing Manager: Louise Derbyshire
Communications Manager: Peter Bretherton; Lesley Kay; Jane King; Craig Morris
Marketing Production: Peter Bretherton; Lesley Kay; Jane King; Craig Morris

If you have any comments or suggestions about Direct Focus please e-mail: marketing@dabs.com

Business Terms & Conditions of sale

Prices subject to change without notice - please visit www.dabs.com for latest prices. All prices exclude carriage. All prices exclusive of VAT are for businesses only. All prices inclusive of VAT are for EU residents (VAT at appropriate rate, currently 17.5%) Non-EU/exempt pay the exclusive price. A full copy of the business terms & conditions is available on request. Calls may be monitored to ensure levels of service and for training purposes (19.04.02) E8/OE

Collect & convert dabspoints to AIR MILES

Visit www.dabs.com/dabspoints for details & conditions

AIR MILES and the Flying Boat logo are trademarks of AIR MILES International Holdings N.V. AIR MILES awards are held and issued for use subject to AIR MILES Customer and Booking Terms and Conditions



delivering technology

quicklinx > shop faster

corporate sales 0870 429 3010

www.dabs.com

500,000 customers can't be wrong

Scaleo 600i PC Intel® Pentium® 4 Multimedia PCs

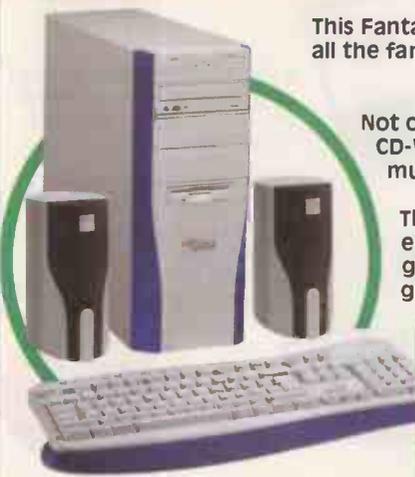
www.dabs.com/fsc

This Fantastic "Ready to go" PC Bundle is perfect for all the family.

Not only is it Internet ready, but also has a CD-WRITER and DVD, perfect for recording music or watching films.

The Geforce 2 graphics with TV-OUT not only enables you to get some of the best 3D graphics from the games supplied but also gives you the capability of recording back to your VCR or playing DVDs on your TV.

Includes Microsoft® Windows XP Home Edition
Microsoft® Worksuite 2001
Microsoft® Word and Works



from
£594.89
(£699.00)

Features Include:

- Intel® Pentium® 4 processor
- 256MB SDRAM Memory
- 56K Modem
- 16xDVDROM
- 16x10x32 CD-RW
- GeForce2 MX400 64MB Card with TVOUT
- Stereo Sound
- Speakers
- Microsoft® Word and Works
- Microsoft® Windows® XP Home Edition



FUJITSU COMPUTERS SIEMENS C500 15" CRT Colour Display

13.7" viewable area
Rec. Resolution 800 x 600
Dot Pitch 0.28mm

See the full range at www.dabs.com/fsc

£85 (£99.87 inc VAT)

99 dabspoints

FUJITSU COMPUTERS SIEMENS C700 17" CRT Colour Display

16.0" viewable area
Rec. Resolution 1024 x 768
Dot Pitch 0.28mm

See the full range at www.dabs.com/fsc

£97.87 (£114.99 inc VAT)

114 dabspoints



FUJITSU COMPUTERS SIEMENS C900 19" CRT Colour Display

18.1" viewable area
Maximum Resolution 1600 x 1200
Plug and Play

See the full range at www.dabs.com/fsc

£169 (£198.57 inc VAT)

198 dabspoints

Scaleo 600i PC

quicklinx 16NSPW

£594.89
(£699.00)

Scaleo 600i PC

quicklinx 12T2PW

£702.13
(£825.00)

Intel® Pentium 4 Processor 1.80GHz, 80GB Hard Disk Drive

Scaleo 600i PC

quicklinx 173LPW

£753.18
(£885.00)

Intel® Pentium 4 Processor 2.0GHz, 40GB Hard Disk Drive



Amilo-D 6500

quicklinx 16M9PW

with Intel® Pentium® III 1GHz processor

www.dabs.com/fsc

This AMILO D Series is a powerful entry-level notebook offering performance at an affordable price.

Clear and sharp 14" display and a built in Combo DVD CD/RW drive to satisfy your everyday work needs.

After hours fun has also been thought about. A FireWire port makes it possible to connect to external devices such as a camera or other external data storage devices.

You can connect to a TV through the standard S-Video port for the ultimate home theatre experience.

only
£949
(£1115.07)

- Intel® Pentium® III 1GHz
- 256MB RAM
- 20GB HDD
- 14.1" TFT High Quality Display
- DVD-CDRW Combo Drive
- Modem & LAN
- Works Suite 2001
- Windows XP



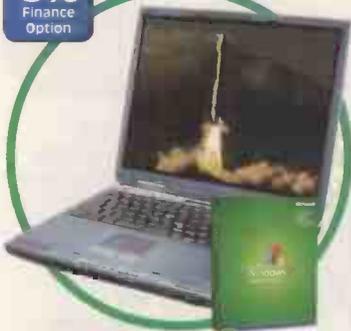
FUJITSU COMPUTERS SIEMENS CTM5010 15" TFT with Speakers

same viewable image size as a conventional 17" display with stereo speakers

See the full range at www.dabs.com/fsc

£285 (£334.87 inc VAT)

334 dabspoints



Amilo-D

quicklinx 1547PW

with Intel® Pentium® III 1.2GHz processor

www.dabs.com/fsc

This AMILO D Series is a powerful entry-level notebook offering performance at an affordable price.

Clear and sharp 15" display and a built in Combo DVD CD/RW drive to satisfy your everyday work needs.

After hours fun has also been thought about. A FireWire port makes it possible to connect to external devices such as a camera or other external data storage devices.

You can connect to a TV through the standard S-Video port for the ultimate home theatre experience.

only
£1105.54
(£1299.00)

- Intel® Pentium® III 1.2GHz
- 256MB RAM
- 30GB HDD
- 15" TFT High Quality Display
- DVD-CDRW Combo Drive
- Modem & LAN
- MS Windows XP (pre-installed)



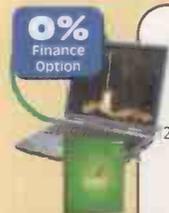
FUJITSU COMPUTERS SIEMENS 17" TFT Display Model CTM7010

17-inch LCD TFT + stereo speakers. Same viewable image size as a conventional 19" display

See the full range at www.dabs.com/fsc

£425 (£499.37 inc VAT)

499 dabspoints



FUJITSU COMPUTERS SIEMENS Amilo-D 6500 notebook

Celeron 1.1GHz processor 28MB, 10GB, 14.1" TFT, DVD, Modem/LAN Works Suite 2001, WinXP. See the full range at www.dabs.com/fsc

£765 (£898.87 inc VAT)

898 dabspoints

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the internet at www.dabs.com, placed from and delivered to a UK postcode



www.dabs.com

e-mail sales@dabs.com

choose from over 16,500 products

HP Omnibooks from only £745 (£875.37)

0% Finance Option

Omnibook XT6200

P4-M 1.4GHz
256MB/30GB
DVD, 56k Modem, LAN
14.1" TFT, MS Windows XP Pro

See the full range at
www.dabs.com/hp

£1399 (£1643.82 inc VAT)

1643 dabspoints

quicklink 1YDKPW

HP XE3 C1060MHz

quicklink 1YDKPW

www.dabs.com/hp



Whether you run your own business or work for a large enterprise, you need a notebook PC that helps you stay on top of it all.

- Intel® Celeron® 700MHz
- 13.3" XGA TFT
- 128MB 10GB
- 56K Modem & LAN
- CD-ROM Drive
- Windows® XP Home Edition



Omnibook XE3 PIII 1.06GHz

quicklink 1YDMPW

www.dabs.com/hp



A convenient, reliable notebook PC that comes with everything you need to do business, and have a little fun, too.

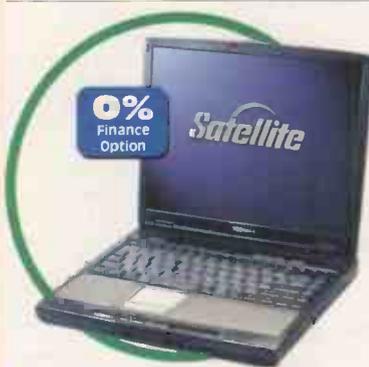
- Intel® Pentium® 1.06GHz
- 14.1" XGA TFT Display
- 128MB 10GB
- 56K Modem & LAN
- CD-ROM Drive
- Windows® 98



Satellite 1800-354S

quicklink 16VMPW

www.dabs.com/toshiba



0% Finance Option

- Intel® Celeron® 1.1GHz processor
- 128MB SDRAM • 15GB Hard Disk Drive
- 14.1" TFT colour high resolution display
- Integrated 24XCD-ROM, FDD
- Integrated Ali M1632 AGP graphics accelerator 3D graphic acceleration, 16MB Video RAM

quicklink TOSHIBA

16VPW Sat 1800-314	679	797.82
16VPPW Sat 3000-x4 C935 128/15/DVD/WXP	739	868.32
16VMPW Sat 1800-354S C1100 128/15/CD/W98	765	898.87
16VQPW Sat 1800-514 C1000 128/15/DVD/WXP	865	1016.37
16VNPW Sat 1800-654S C1100 128/20/DVD/W98	959	1126.82

ex VAT inc VAT

only £765 (£898.87)

Visit www.dabs.com/toshiba to see live stock displays, up to the minute pricing, product information and special offers



TOSHIBA

Sony Vaio NV109M 256MB/30GB

quicklink 1YRSPW

www.dabs.com/sony



0% Finance Option

This state-of-the-art desktop alternative solution combines the latest Intel processing power with the most complete set of features available.

- Mobile Intel® Pentium®4 1.60GHz-M Processor - Enhanced Speedstep
- 15" TFT XGA Screen
- CDRW/DVD Combo Drive
- 256DDR-DSRAM (512MB Max)
- MG Memory Stick Slot
- Net MD Drive & Compact Subwoofer
- 30GB HDD
- i-Link (IEEE1394) Port
- V90 56K Flex Modem
- Adobe® Premiere LE

Net MD



SONY

Sony Clie NR70V Colour

quicklink 1YSCPW

www.dabs.com/sony



- Palm 4.1 OS
- Dragonball VZ66MHz Processor
- Flip and Rotate High Resolution Colour Screen
- Integrated Miniature Keyboard
- In Built Digital Still Camera
- Memory Stick Slot
- Jog Dial Interface
- World Alarm Clock
- IR Remote Control Function
- USB Cradle Included

SONY

Compaq iPaq 3870 Pocket PC

quicklink 13CTPW

www.dabs.com/compaq



Slim and Powerful - TFT screen with 65,000+ colors, increased battery life, fastest available processor in a sleek, award-winning design.

- 206 MHz Processor
- Touch Screen
- 240 x 320 Resolution
- 64MB RAM, 32MB RAM
- 6.7 oz. Weight including battery

COMPAQ

Portables

quicklink	APPLE iBook	ex VAT	inc VAT
13BPW	G3 500 128/15/CD/12.1"	865	1016.37
13BPW	G3 500 128/15/DVD/12.1"	1065	1250.20
16HDPW	G3 600 256/20/CD-RW/DVD/14.1"	1299	1526.32
APPLE PowerBook			
160KPW	G4 550 256/12/CD-RW/DVD/15.2"	1635	1921.12
160LPW	G4 667 512/30/CD-RW/DVD/15.2"	2115	2485.12
SONY			
168CPW	FX503 PIII1GHz 256/20 CD-RW/DVD	1089	1279.57
16MTPW	SRX41P PIII800A 256/30 LAN/WXP	1499	1761.32
1775PW	R600HFPD PIII1GHz 256/30 CD-RW/DVD	1469	1726.07
12D2PW	GR214MP PIII1GHz 256/20 CDRW/DVD	1290	1515.75
12D5PW	GR215MP PIII1GHz 256/30 CDRW/DVD	1850	2173.75
12D2CPW	GR215SP PIII1.2GHz 256/40 CDRW/DVD	2399	2818.82

0% Finance Option

Omnibook 510

PIII 933MHz Intel®
Mobile Pentium® Processor
128MB/10GB/Modem/LAN
Windows XP Pro

See the full range at
www.dabs.com/hp

£1199 (£1408.82 inc VAT)

1408 dabspoints

quicklink 18M4PW

Handhelds (PDAs)

quicklink	COMPAQ	ex VAT	inc VAT
13CTPW	iPAQ 3870 64MB SD Bluetooth	489	574.57
13ONPW	iPAQ H3850 64MB PC2002 Colour	429	504.07
1372PW	iPAQ H3760 Pocket PC Colour 64	379	445.32
HEWLETT PACKARD			
11JGPW	Jornada 565 32MB	330	387.75
11JKPW	Jornada 568 64MB	370	434.75
PNKPW	Jornada 720 32MB	495	581.62

0% Finance Option

FUJITSU COMPARE SIEMENS

Pocket Loox Coming Soon

Pocket Loox 600 - 64MB
Wireless data and voice,
SD/MM CF slots,
TFT screen, MS2002

See the full range at
www.dabs.com/fsc

£399 (£468.82 inc VAT)

468 dabspoints

quicklink 1YLLPW

0% Finance Option

FUJITSU COMPARE SIEMENS

Amilo-D 6500 notebook

Celeron 1.1GHz, 256MB,
20GB, 14.1" TFT, DVD/CDRW
Combo, Modem/LAN,
Works Suite 2001, WinXP.

See the full range at
www.dabs.com/fsc

£892.77 (£1049.00 inc VAT)

1049 dabspoints

quicklink 1544PW

See our website for latest prices

0% online finance option
Available when you order over £500 of equipment from dabs.com see page 2
www.dabs.com/finance

easy
on the
wallet

delivering
technology

quicklinx > shop faster

corporate sales 0870 429 3010

www.dabs.com

HP PCs from only £345 (£405.37)

HP XE310 Essential Line PC



monitor not inc.

www.dabs.com/hp

quicklinx 160WPW

The most affordable business PC from HP, configured to meet the needs of day-to-day office work.

- Intel Celeron™ 1GHz Processor
- 128MB SDRAM Memory
- 20GB Ultra ATA/66HDD
- 48x CDROM Drive • 10/100 Base-T LAN
- Microsoft Windows XP Home Edition

160ZPW	XE310 Intel Pentium III 1GHz 128MB 20GB CD LAN Windows XP Professional Edition	ex VAT	inc VAT
260ZPW	HP 15" Monitor Square CRT 0.28mm 13.8" Viewable	88	105.40
YRBPW	HP 17" Monitor Square CRT 0.28mm 15.9" Viewable	119	139.82



only
£359
(£421.82)

HP 15" TFT Flat Panel Display
£299 (351.32)

Model:15" TFT

quicklinx > 11XPW **Go**

0% Finance Option

HP Vectra VL420
Pentium 4 1.6GHz
256MB/20GB/CD/LAN
Windows XP Pro*
Monitor not included

See the full range at www.dabs.com/hp

£505 (£593.37 inc VAT)
598 dabspoints

quicklinx 1575PW

0% Finance Option

HP e-PC
Pentium 4 1.8GHz
256MB 133MHz SDRAM
20GB/CD/LAN
Windows XP Pro*
Monitor not Included

See the full range at www.dabs.com/hp

£599 (£703.82 inc VAT)
703 dabspoints

quicklinx 1YDJPW

0% Finance Option

COMPAQ
Evo D300v
P4 1.7GHz 256/40
DVD/CD-RW
nVidia GeForce2 32MB
Speakers
Microsoft®
Windows XP Pro

See the full range at www.dabs.com/compaq

£799 (£938.82 inc VAT)
938 dabspoints

quicklinx 17JPPW



0% Finance Option

NEW

Sony Vaio RX300 Series

www.dabs.com/sony

The VAIO PCV-RX Series allows you to explore the top-end of the audio-visual world.

- Perfect gateway for broadband connectivity
- iLINK port and memory stick slot
- Powered for audio/video convergence
- Built-in modem
- Microsoft Works 6.0
- Software for picture & video editing & web design

quicklinx	SONY VAIO	ex VAT	inc VAT
1YR1PW	RX301 AMD 1800XP 256MB 40GB CD-RW & DVD	475	558.12
1YR2PW	RX302 Pentium4 1.8GHz 256MB 40GB CD-RW & DVD	975	1145.62
1YR3PW	RX305 Pentium4 2.2GHz 256MB 80GB DVD-RW & CD	1139	1338.32
1YR4PW	RX306 Pentium4 2.2GHz 512MB 120GB DVD-RW & CD	1435	1686.12

from
£759
(£891.82)

- Intel Pentium 4 Processor 1.8, 2 or 2.2GHz or
- AMD 1800 XP Processor models available
- 256 or 512 MB DDR RAM
- Microsoft Windows XP Home Edition



SONY



Palm™ m515 Handheld
16MB OS 4.1

www.dabs.com/palm

The Palm™ m515 handheld is the ultimate combination of style and power. A new, brighter colour display offers outstanding readability with more than 65,000 colours and an adjustable backlight for maximum viewing control. 16MB of memory allows you to store large databases, applications and video clips with room to spare. And a powerful operating system is contained within a sleek platinum design that's lightweight yet durable. The Palm m515 handheld has the ability to grow with your needs. Simply plug in a stamp-sized expansion card to add software applications, eBooks, additional memory, backup and more, without taking up built-memory space.

only
£275
(£323.12)

- Vivid colour
- Intuitive and versatile
- 16MB memory
- Expansion card slot
- Universal connector
- Wireless internet
- USB ready for Mac and Windows

Toshiba Pocket PC e570 64MB Colour

quicklinx 12Y4PW

www.dabs.com/toshiba



Combines high performance with a superb user interface, giving you maximum power and convenience in the palm of your hand

- High performance
- Wide range of connectivity - also enabled for wireless communication
- 64MB
- Lightweight - Slim case
- pre-installed software

Zaurus SL-5500 Handheld

quicklinx 1Y13PW

www.dabs.com/sharp



Offering everything from mobile communications to mobile multimedia; keyboard integration and dual expansion delivering one of the most versatile and flexible PDA solutions on the market today.

- 206MHz Processor
- Integrated Keyboard
- CF & SD Expansion Slots
- 64Mb SDRAM
- Wireless Communications

only
£379
(£445.32)

0% Finance Option

Apple
iMac G4 800
with 15" Display
256MB Memory, 40GB HD
DVD-R/CD-RW & Modem
Stereo Speakers, Keyboard & Mouse, Great Software

See the full range at www.dabs.com/mac

£1309 (£1538.07 inc VAT)
1538 dabspoints

quicklinx 16F5PW

FUJITSU powered by SIEMENS
Scenic-T MicroTower
Intel® Celeron® 1GHz
128MB, 20GB, CD-ROM
WinME preloaded, Win98 on CD
3 Years on-site warranty

See the full range at www.dabs.com/fsc

£365 (£428.87 ex VAT)
405 dabspoints

quicklinx 177WPPW

NEW

Palm™ m130 Handheld
Colour display.
Compact, lightweight & durable with protective cover

See the full range at www.dabs.com/palm

£173 (£203.27 inc VAT)
203 dabspoints

quicklinx 177WPPW

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode



'16" TFT LCD Panel'
SDM-M61 1280 x 1024 resolution • TCO '99
quicklink ZQCPW
www.dabs.com/sony

£539
(£633.32)

SONY

www.dabs.com

e-mail sales@dabs.com

choose from over 16,500 products

FREE internet printing software with

iiyama
VM1411 17" DiamondTron
15.9" viewable
Max resolution 1024x768
Simple to operate
See the full range at
www.dabs.com/iiyama

£129.99 (€152.73 inc VAT)
152 dabspoints

Sony HMD-A230 17"
quicklink 12NZPW
www.dabs.com/sony

£209 (€245.57)

SONY

- 1.3 MegaPixel resolution (1280 x 1024) at 85 Hz
- Unique tiltable casing design with silver metallic bezel
- L-SAGIC electron gun

CTX VL700 17" FST
quicklink 7C8PW
www.dabs.com/ctx

£99 (€116.32)

CTX
The Monitor Specialists

- Resolution 1024 x 768@114Hz
- 17" FST (16" viewable)
- Pixel Pitch: 0.27mm
- Plug and Play
- PC/MAC
- 3 Year on-site warranty

MS75F 17" Monitor
quicklink 162DPW
www.dabs.com/mitsubishi

£119 (€139.82)

NEC/MITSUBISHI
NEC-MITSUBISHI ELECTRONICS DISPLAY

- 16" viewable screen area
- 0.24mm aperture grille
- 1600 x 1200 resolution
- Invar shadow mask
- Anti-glare
- Plug and Play
- 3 Year Warranty

NEW

iiyama
VM1451 19" FST Display
18" viewable
Max resolution 1600x1200
0.26mm dp
See the full range at
www.dabs.com/iiyama

£159 (€186.82 inc VAT)
186 dabspoints

Sony CPD-E430 19"
quicklink 12PCPW
www.dabs.com/sony

£299 (€351.32)

SONY

- 1.3 MegaPixel resolution (1280 x 1024) at 91 Hz
- Stylish design and great Images
- Visually flat screen
- L-SAGIC electron gun
- 3 Year Warranty

CTX VL950T 19"
quicklink 7CFPW
www.dabs.com/ctx

£165 (€193.87)

CTX
The Monitor Specialists

- Resolution 1600x 1200 @75Hz
- 19.0" CRT (18.0" viewable)
- Pixel Pitch: 0.26mm
- Plug and Play
- PC/MAC
- 3 Year on-site warranty

iiyama VM Pro 454 19"
quicklink 1689PW
www.dabs.com/iiyama

£289 (€339.57)

iiyama

- 19" CRT (18" viewable)
- Max resolution 1800 x 1440 @ 85Hz
- 0.25mm dp
- Mac & PC compatible
- 3 years warranty

Belnea
10 80 80 22" CRT Display
Great quality 1920 x 1440
20.3" viewable
0.24mm dot pitch
2 Years Warranty
See the full range at
www.dabs.com/belnea

£489 (€574.57 inc VAT)
574 dabspoints

Sony CPD-E530 21"
quicklink 14KCPW
www.dabs.com/sony

£499 (€586.32)

SONY

- 1.9 MegaPixel resolution (1600x1200) @95 Hz
- Stylish design and great Images
- Visually flat screen
- L-SAGIC electron gun
- 3 Year Warranty

CTX VL1300 21"
quicklink 14PLPW
www.dabs.com/ctx

£389 (€457.07)

CTX
The Monitor Specialists

- Resolution 1600 x 1200@91Hz
- 21" FST (20" viewable)
- Pixel Pitch: 0.26mm
- Plug and Play
- PC/MAC
- 3 Year on-site warranty

iiyama VM Pro 512 22"
quicklink 12LDPW
www.dabs.com/iiyama

£539 (€633.32)

iiyama

- 20" viewable
- Maximum resolution 1800 x 1440@82Hz
- PC/Mac compatible
- Plug & Play
- 0.24mm AG Pitch
- Tilt & Turn Stand
- On-screen display

Relisys
TL540 15" TFT Monitor
Portrait/Landscape
Swivel Panel
Silver/Carbon Trim
Includes speakers
See the full range at
www.dabs.com

£269 inc VAT
269 dabspoints

Sony SDM-M51D 15.1"
quicklink XPZPW
www.dabs.com/sony

£369 (€433.57)

SONY

- Designer TFT LCD
- 1024 x 768
- DVI-I
- Digital/Analogue Input
- Intelligent Auto-Adjust
- Double pivot stand

CTX PV505 15.1" TFT
quicklink VJ7PW
www.dabs.com/ctx

£249 (€292.57)

CTX
The Monitor Specialists

- 1024 x 768
- Pixel Pitch: 0.30mm
- 16.7 million colours
- TCO '99
- Pivot Screen (software extra)

Dabsvalue 15" TFT LCD
quicklink 10C7PW
www.dabs.com/value

£249 (€292.57)

dabsvalue

- TCO '99
- 1024 x 768
- 250:1 Contrast
- Great quality at a great price!
- 3 Year On site Warranty

iiyama
VL770 17" FST Display
18" viewable
Max resolution 1280x1224
0.264mm dp
See the full range at
www.dabs.com/iiyama

£449 (€527.57 inc VAT)
527 dabspoints

Relisys TL770 17"
quicklink 17J9PW
www.dabs.com

£435 (€511.12)

RELISYS
SPECIALLY DESIGNED

- 1280 x 1024
- 60-75Hz
- 0.264mm pitch
- Built in speakers and headphone socket

CTX PV720A 17.1" TFT
quicklink 138BPW
www.dabs.com/ctx

£459 (€539.32)

CTX
The Monitor Specialists

- 17.1" TFT LCD Panel
- 0.26 mm Pixel Pitch
- Resolution 1280 x 1024
- 24-bit (16.7M colour)
- 3 years warranty

Dabsvalue 17" TFT LCD
quicklink 10C8PW
www.dabs.com/value

£375 (€440.62)

dabsvalue

- TCO '99
- 1280 x 1024 @60Hz
- 16million colours
- Great quality at a great price!
- 3 Year On site Warranty

iiyama
AS4611UT 18" LCD Display
18" viewable
Max resolution 1280x1024
0.28mm pixel
See the full range at
www.dabs.com/iiyama

£569 (€668.57 inc VAT)
668 dabspoints

Sony SDM-M81 18.1"
quicklink X8FPW
www.dabs.com/sony

£799 (€938.82)

SONY

- Max. resolution 1280 x 1024
- Ultimate modern design
- Integrated speakers
- PC & Mac Compatible
- 3 Year Warranty

CTX PV880C 18.1" TFT
quicklink 16DSPW
www.dabs.com/ctx

£679 (€797.82)

CTX
The Monitor Specialists

- 18.1" LCD
- 0.28 mm Pixel Pitch
- Resolution 1280 x 1024
- On Screen Display
- USB
- Plug and Play
- 3 Year on-site warranty

LCD 1830 18" LCD TFT
quicklink Y97PW
www.dabs.com/mitsubishi

£699 (€821.32)

NEC/MITSUBISHI
NEC-MITSUBISHI ELECTRONICS DISPLAY

- 18" LCD TFT Panel
- 1280 x 1024 @ 60Hz
- TCO '99
- Energy Star
- On-Screen Manager (OSM)
- Plug & Play
- Low Power Consumption
- 3 Year Warranty

See our website for latest prices

Get 5
FREE
Prints

Get amazing prints
& more from YOUR
digital photos

dabs
dabsxpose.com

delivering
technology

quicklink >shop faster

dabspoints with every purchase

www.dabs.com

all Digital Cameras sold at dabs.com

**FinePix
601 Zoom**

quicklink 177KPW

www.dabs.com/fuji



The latest addition to the FinePix range of signature series compact digital cameras.

- 3.1 megapixel
- VGA movie cap 128MB Smartmedia
- USB connectivity
- 1.5" TFT display

quicklink	FUJIFILM	ex VAT	inc VAT
YBKPW	FinePix 6900 zoom Digital Camera	505	593.37
14CKPW	Axia-ix 100 Digital Camera	82	96.35
11JWPW	FinePix 2600 Zoom Digital Camera	209	245.57

FUJIFILM

**Sony DCR-TRV340
Digital Handycam D8**

quicklink 17YGPW

www.dabs.com/sony



Take exceptional-quality digital video & great digital still photos that you can quickly & easily transfer to your computer using Memory Stick® or the built-in USB connection.

- 25X Optical/700X Digital Zoom
- Digital Still Memory Mode
- MPEG Movie Mode
- 2.5" SwivelScreen™ LCD Display
- Super SteadyShot®
- 12-Bit/16-Bit PCM Digital Stereo

SONY

Minolta Dimage X

quicklink 1740PW

www.dabs.com



A Revolutionary Digital Camera Design Incorporating a 3x Optical Zoom

- 2.0 million pixel digital
- 20 mm depth
- 3.8cm TFT colour - Total number of pixels: 110,000

quicklink	MINOLTA	ex VAT	inc VAT
XZ1PW	Dimage S	419	492.32
ZZFPW	Dimage 5304	279	327.82

MINOLTA

**Sony VPL-CS4 Ultra
Portable Projector**

quicklink 13MTPW

www.dabs.com/sony



0% Finance Option

Designed to work with almost any computer and video source, this projector offers "true plug and play" operation

- SVGA 1000ANSI Lumens
- Weighs just 2.4kg
- Auto pixel alignment
- Stereo Speakers
- Quiet operation

SONY

only
£1275
(£1498.12)

**Canon Ixus V2 2.0
Megapixel DC**

quicklink 1YCHPW

www.dabs.com/canon



NEW

Canon
Imaging across networks

- 2 Megapixel CCD
- 2x optical zoom
- 3-point Artificial Intelligence Auto Focus (AI AF)
- Optical and LCD viewfinder
- USB Interface

quicklink	CANON	ex VAT	inc VAT
XNMDC	Digital IXUS V	309	363.07
10HXDC	PowerShot G2	539	633.32
13VCDC	PowerShot S30	399	468.82

only
£299
(£351.32)

**DX-4900
EasyShare**

quicklink 1Y75PW

www.dabs.com/kodak



- 4.0MP resolution
- 6X zoom (2X optical, 3X Advanced Digital Zoom)
- COMPACTFLASH memory card expansion slot
- Compatible with the KODAK EASYSHARE camera dock

quicklink	KODAK	ex VAT	inc VAT
1YJ5PW	DX3600 Easyshare	189	222.07
1YJ6PW	Easyshare Dock	37	43.47

Kodak

only
£299
(£351.32)

SONY

**HP 812 Digital
Camera**

quicklink 1Y1DPW

www.dabs.com/hp



- 4 Megapixel Digital Camera
- Exceptional image quality
- Easy-to-use
- Destination pre-selection
- HP Instant share
- Docking station (optional)

quicklink	HP	ex VAT	inc VAT
1Y1BPW	120 Digital Camera	75	88.12
11H7PW	318 Digital Camera	145	170.37
13J1PW	612 Digital Camera	180	214.50
11HCWP	715 Digital Camera	265	311.37

hp
invent

only
£299
(£351.32)

**Nikon
CoolPix 885
Digital Camera**



3.2 Megapixel Resolution
16MB Flash Card
Built-in Flash
1.5" Colour LCD-display
See the full range at www.dabs.com

£315 (£370.12 inc VAT)
1128 dabspoints

**NEC
VT45G LCD
Projector**



1000 ANSI Lumens
SVGA (800X600) with
three 0.7" LCD panels
Weights only 2.5kg
3-year warranty
See the full range at www.dabs.com

£1349 (£1585.07 inc VAT)
1585 dabspoints

**OLYMPUS
C220 Zoom
Digital Camera**



2.1 Megapixel
8MB SmartMedia Card
3x optical zoom
2.5x digital zoom
See the full range at www.dabs.com

£167 (£196.22 inc VAT)
196 dabspoints

**CREATIVE
Webcam
USB 1.1 Interface**



Video resolutions from
160x120 to 352x288
Advanced CMOS sensor
(352x288 resolution)
See the full range at www.dabs.com/creative

£19 (£22.32 inc VAT)
22 dabspoints

**SONY
DSC-P5 Cyber-shot
Digital Camera**



3.2 MegaPixel
Super HAD CCD
3x optical zoom
MPEG Movie EX/HQ
See the full range at www.dabs.com/sony

£389 (£457.07 inc VAT)
457 dabspoints

**CTX
PS-5100
1000 Lumens**



Built-in speakers
Manual Zoom and
focus lens
Auto-Sync function
quick/easy set-up
See the full range at www.dabs.com/ctx

£1249 (£1467.57 inc VAT)
1467 dabspoints

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode



'Great Value Bundle'
Epson Stylus C60/Perfection 1250 Photo
quicklink 1725PW
www.dabs.com/epson

£133
(£156.27)

EPSON

www.dabs.com

e-mail sales@dabs.com

corporate sales 0870 429 3010

new Epson Stylus C40 only £52 (£61.10)

Digital Audio Players

quicklink	CREATIVE	ex VAT	inc VAT
12FPFW	Jukebox 20GB	254.47	299.00
	NAPA		
XCSPW	DAV311 CD Player	55	64.62
14CLPW	DAV316 CD Player	59	69.32
14CMPW	MCD380	79	92.82
	SONY		
1101PA	NW-E7 Network Walkman	165	193.87
T6TPW	NWE3 Network Vers	175	205.62

Speakers

quicklink	CREATIVE	ex VAT	inc VAT
11YFPW	inspire 5.1 5300	75	88.12
13WTPW	inspire 5.1 5700	212	249.10
12PGPW	CSW Megaworks 5100	255	299.62
	VIDEOLOGIC		
GCOPW	Digitheatre	175	205.62
16YFPW	ZXR-500	57	66.97
WHHPW	Digitheatre LC	89	116.32

Inkjet Printers

quicklink	Canon	ex VAT	inc VAT
1646PW	S200	48	56.40
1648PW	S300	79	92.82
1649PW	S520	119	139.82
	Epson		
X4GPW	Stylus Color C20	44	51.70
X4HPW	Stylus Color C40	52	61.10
10VPPW	Stylus Color C80	131	153.92
11LHPW	Stylus Color C70	103	121.02
119JPW	Stylus Photo B10	89	104.57
Y2JPW	Stylus Photo B95	133	156.27

FS-1000+
12ppm ECOSYS
12 pages A4 per minute
Cartridge-free ECOSYS
Technology only toner
5 standard emulations

See the full range at
www.dabs.com/kyocera

£235 (£276.12 inc VAT)

276 dabspoints

quicklink ZJLPW

Laser Printers

quicklink	CANON	ex VAT	inc VAT
Z51PW	LBP-810	165	193.87
	KYOCERA		
ZJLPW	FS-1000+	237	278.47
R2SPW	FS-1800	575	675.62
R2TPW	FS-3800	755	887.12
	LEXMARK		
10TSPW	E210	145	170.37
13LGPW	E320	189	222.07
13LHPW	E322	232	272.60
	MINOLTA QMS		
MQLPW	PagePro 1100L	145	170.37
MQKPW	PagePro 1100	195	229.12
	OKI		
LC3PW	OkPage 8p Plus	199	233.82
R2SPW	OkPage 14ex	209	245.57
	PANASONIC		
SQ2PW	KX-P6300	165	193.87
SQ1PW	KX-P6500	199	233.82

Multifunction Devices

quicklink	Brother	ex VAT	inc VAT
QW1PW	MFC-9060	255	299.62
V1JPW	MFC-840	335	393.62
	Canon		
M4MPW	MultiPass C70	209	245.57
M4NPW	MultiPass C80	219	257.32
1Y27PW	Smartbase MPC600F	309	363.07
1Y38PW	Smartbase MPC400	299	269.07
1Y39PW	Smartbase PC1210D	469	551.07
1Y3BPW	Smartbase P1230D	565	663.87
	HP		
TY2PW	OfficeJet V40	155	182.12
KX5PW	OfficeJet G55	230	270.25
KX6PW	OfficeJet G85	309	363.07
	LEXMARK		
Z2SPW	X73 All-in-One Imaging Centre	135	158.77
Z2TPW	X83N All-in-One Print Centre	159	186.82

HP DeskJet 940C 2400 x 1200dpi

quicklink 11GVPW
www.dabs.com/hp



only
£79
(£92.82)



Explore your creative powers with HP's brilliant photo-quality colour InkJet printers.

- 12ppm black, 10ppm colour
- 2400x1200dpi, 2MB built in RAM
- HP PCL Level 3

quicklink	HP DESKJETS	ex VAT	inc VAT
11GMPW	DeskJet 656C	6ppm black 3ppm colour 600dpi	40 47
11GPPW	DeskJet 845C	8ppm black 5ppm colour 600 x 1200 dpi	60 70.50
11GSPW	DeskJet 920C	9ppm black 7.5ppm colour 2400 x 1200 dpi	59 69.32
Q3VPW	DeskJet 990Cxi	17ppm black 13ppm colour 2400 x 1200 dpi	155 182.12
11HOPW	DeskJet 995C	16ppm black 12ppm colour Bluetooth Technology	245 287.87
GLJPW	SupportPack	3 Year Next Day Replacement for the above	40 47.00

Epson Stylus Photo 950

quicklink 1YRQPW
www.dabs.com/epson

only
£281
(£330.17)



EPSON

- 2880 x 1440 dpi resolution
- Unique EPSON software for easy photo printing, finishing and CD printing
- Edge-to-edge printing all round on A4 prints and 100 x 150mm
- Maximum cost efficiency with 7 resealable individual ink cartridges
- PRINT Image Matching enabled
- Roll paper holder, auto cutter and photo catcher included

HP LaserJet 1000w 10ppm 600dpi

quicklink 120GPPW
www.dabs.com/hp



only
£170
(£199.75)



HP's most affordable LaserJet printer.

- Up to 10ppm print speed, A4
- 600 dpi
- USB (plug & play)
- Windows printer

quicklink	HP LASERJETS	ex VAT	inc VAT
VYBPW	LaserJet 1200 14ppm 1200dpi 8MB	225	264.37
VYCPW	LaserJet 1200n 14ppm 1200dpi 16MB	345	405.37
VYDPW	LaserJet 1220 Printer/Copier/Scanner	295	346.62
12NHPW	LaserJet 2200 18ppm 1200dpi 8MB	450	528.75
VYGPW	LaserJet 4100 24ppm 1200dpi 16MB	760	893.00

Epson EPL-5900 Laser Printer

quicklink 116GSPW
www.dabs.com/epson

only
£199
(£233.82)



EPSON

The new EPSON EPL-5900 is the ideal laser printing solution for the PC or Mac user, offering high speed black and white laser printing at speeds up to 12PPM. EPSON's advanced resolution technologies such as EPSON RITech for professional business documentation.

quicklink	EPSON	ex VAT	inc VAT
160RPW	EPL 5900L	159	186.82
14WRPW	AcuLaser C1000	765	898.87
14WSPW	AcuLaser C1000N	849	997.57

Lexmark Z45 A4 Colour Jetprinter

quicklink 18CSPW
www.dabs.com/lexmark

only
£79
(£92.82)



NEW

- 3600 x 1200 dpi resolution (colour)
- Up to 17 pages per minute (mono) and 13 pages per minute (colour)
- Drivers & Utilities

LEXMARK

quicklink	LEXMARK	ex VAT	inc VAT
18GNPW	Z25	41	48.17
18CPPW	Z35	47	55.22
18GVPW	Z65	99	116.32

Canon S9000 Colour Printer

quicklink 164GPPW
www.dabs.com/canon

only
£365
(£428.87)



Canon

- MicroFine Droplet Technology, using six individual ink tanks - black, cyan, magenta, yellow, photo magenta, and photo cyan.
- 2400x1200dpi
- MicroFine Droplet Technology™
- 6-colour ink system
- Prints A4 and A3
- USB and Parallel

Samsung ML-6060 12MB Laser Printer

quicklink 1N91PW
www.dabs.com/samsung

only
£209
(£245.57)



The ML-6060 is ideal for the smaller workgroup.

- 12 ppm print
- 1200dpi image quality
- 12MB memory
- 6000 page one piece drum toner cartridge
- PCL 6 Emulation
- 550 sheet standard paper tray

SAMSUNG

quicklink	SAMSUNG	ex VAT	inc VAT
YTQPW	ML-1210 Mono Laser printer	99	116.32
PWQPW	ML-6040 Mono Laser printer	165	193.87
ZGJPW	ML-1250 Mono Laser printer	99	116.32
N92PW	ML-6040N Ethernet Mono Laser	299	351.32

Brother HL-1230 Mono Laser printer

quicklink 10GMPW
www.dabs.com/brother

only
£152
(£178.60)



The HL-1230 printer is quick and easy to install and includes the benefit of comprehensive, state of the art technical support with Windows Interactive Animations.

- 600 x 600 dpi resolution
- 12 ppm - max speed
- 250 sheet paper capacity

brother

quicklink	BROTHER	ex VAT	inc VAT
10GNPW	HL-1440	179	210.32
10GPPW	HL-1450	214	251.45
10GTPW	HL-1470N	315	370.12

go wireless for £60 under **ex vat**

quicklink ACTIONTEC

178BPW	WiFi PC/MCIA Card	59.99
178DPW	WiFi USB Adaptor	59.99
178FPW	WiFi PCI Card	59.99

visit www.dabs.com/actiontec

delivering technology

quicklink > shop faster

dabspoints with every purchase

www.dabs.com

Cordless Mice from only £33 (£38.77)

Epson Perfection 1250 Photo inc. Trans

quicklink 10G6PW

www.dabs.com/epson



- True 1200dpi high quality scanning
- 48-bit colour scanning
- 35mm Transparency Unit
- New EPSON TWAIN 5.5
- QuickStart buttons
- USB connectivity

quicklink	EPSON	ex VAT	inc VAT
10GD PW	Epson Perfection 1250	67	78.72
10GGPW	Epson Perfection 1650	127	149.22
10GHPW	Epson Perfection 1650 Photo	134	157.45
11LKPW	Epson Perfection 2450 Photo	224	263.20

EPSON

only **£90**
(£105.75)

Canoscan D1250U2F 48-bit colour scanner

quicklink 1643PW

www.dabs.com/canon



Canon
Imaging across networks

- 48-bit colour flatbed scanner
- 9600 x 9600 dpi (Interpolated)
- 1200 dpi x 2400 dpi (Optical)
- Software Included: Drivers & Utilities, Adobe PhotoShop Elements, ArcSoft PhotoBase, Canon PhotoRecord, ScanGear CS-U 6.3, plus lots more

quicklink	CANON	ex VAT	inc VAT
1642PW	D1250U2	97	113.97
1643PW	D1250U2F	132	155.10
10TWPW	FS4000US	555	652.12

only **£132**
(£155.10)



MICROTEK ScanMaker 5600 A4 Flatbed Scanner

2400x4800dpi
True 48bit colour
5 function buttons
USB Mac & Windows
See the full range at
www.dabs.com/microtek

£155 (£182.12 inc VAT)
182 dabspoints



UMAX Astra 4450 Flatbed Scanner

48-bit, colour CCD
1200 x 2400 dpi (optical)
9600 x 9600dpi (maximum)
Scan area up to 8.5" x 11.7"
See the full range at
www.dabs.com/umax

£101 (£118.67 inc VAT)
118 dabspoints



visioneer One-Touch 8700 Flatbed Scanner

48-bit, colour CCD
1200 x 4800 dpi (optical)
FlashBack Bi-directional
AutoScan Technology
See the full range at
www.dabs.com/visioneer

£76 (£89.30 inc VAT)
89 dabspoints

HP All-in-One products help you conserve space, money and time.



OfficeJet V40 The OfficeJet V40 is ideal for home and office users who want to print, scan and copy - with great performance.

£155
(£182.12)



OfficeJet K80 For microbusinesses and telecommuters who need an integrated product to print, fax, copy, scan all in colour.

£199
(£233.82)



OfficeJet d135 The OfficeJet d135 combines brilliant photo quality printing with faxing, scanning and copying.

£305
(£358.37)

www.dabs.com/hp

HP ScanJet series - value for money combined with ease of use.



ScanJet 4470C true 1200dpi with 48-bit colour scanning. 35mm transparency unit also included. HP PrecisionScan Pro software with optical character recognition (OCR)

£89
(£104.57)



ScanJet 5400C 2400dpi with true 48-bit colour scanning. One touch buttons optimise each scan for effortless photo quality results.

£120
(£141.00)



ScanJet 7400C 2400dpi with true 48-bit colour scanning - With twice the resolution of most scanners in its class and a 4 second preview scan.

£289
(£339.57)

www.dabs.com/hp

Netgear Wireless Access Point & Card

quicklink XXWPW

www.dabs.com/netgear



- Wireless connectivity at 11Mbps
- Reliable, 802.11b standard-based networking
- 40-bit WEP encryption security
- 5 Year Limited Warranty

quicklink	NETGEAR	ex VAT	inc VAT
NSPPW	FA311 10/100 PCI NIC	12	14.10
Q13PW	FA312 10/100 PCI NIC WOL	14	16.45
6K2PW	8 Port Hub	27	31.72
6K5PW	16 Port Hub	69	81.07
132WPW	USB Wireless Adaptor	75	88.12
YKNPW	PC/MCIA Wireless Adaptor	68	79.90
YKQPW	Wireless Access Point	125	146.87
Q2KPW	Netgear Network Starter Kit	30	35.25

NETGEAR

only **£149**
(£175.07)

Belkin USB 4 Port Economy Hub

quicklink QXCPW

www.dabs.com/belkin



BELKIN

- Fast 12Mbps data rate
- Quick, easy Plug-&-Play installation
- 5 power & port status lights
- Fully compatible with Windows*95, Windows*98, Windows*2000, OSR2 and Mac*OS 8.1 or higher

quicklink	BELKIN	ex VAT	inc VAT
Q6CPW	IEEE 1394 Firewire PCI Card PC	50	58.75
108HPW	USB 2.0 PCI Card	42	49.35
SF1PW	QuadraBus 4 Port USB PCI Card	29	34.07
1785PW	USB Media reader/Writer - CF I/II	25	29.37
1786PW	USB Media reader/Writer - SM	25	29.37
1787PW	USB Media reader/Writer - MMC/SD	25	29.37

only **£19**
(£22.32)

Microsoft Internet Keyboard Pro

quicklink G53PW

www.dabs.com/Microsoft



Launch your browser and surf the web directly from your keyboard. 19 Hot Keys to give you superior control over your PC. Two desktop USB ports for easy plug and play. Detachable palm rest. USB and PS/2 compatible keyboard.

quicklink	MICROSOFT	ex VAT	inc VAT
G54PW	Internet PS/2	14	16.45
G53PW	Internet Pro USB & PS/2	24	28.20
G52PW	Natural Pro USB & PS/2	29	34.07
Z1WPW	Office Keyboard PS/2 USB	35	41.12

Microsoft

Logitech Cordless Optical Mouse

quicklink 1670PW

www.dabs.com



Logitech

Everything you want in a mouse: cordless, precise and comfortable. Logitech, the creator of the cordless mouse, combines digital radio technology and exclusive Agilent optical technology to give you the greatest accuracy in a hand-fitted design for the ultimate mouse.

quicklink	LOGITECH	ex VAT	inc VAT
W78PW	Cordless Mouseman Optical USB	33	38.77
SX3PW	Wheel Mouse Optical	19	22.32
TOVWPW	Pilot Wheel Mouse - PS2 & USB	13	15.27
KR7PW	Pilot Mouse PS/2 & Serial	10	11.75

only **£28**
(£32.90)

Scanners

quicklink	MICROTEK	ex VAT	inc VAT
PD3PW	ScanMaker X12 USL Photo-inc TMA	185	217.37
SQJPW	FilmScan 35 USB 1800dpi 36-bit	129	151.57
VB8PW	Dimage Scan Dual II USB	279	327.82

UPS & Surge Protection

quicklink	BELKIN	ex VAT	inc VAT
QBWPW	Regulator Gold Series 325VA	59	69.32
QBXPW	Regulator Gold Series 425VA	69	81.07
OXMPW	Single Outlet Surge Protector+Tel	10	11.75
OQKPW	4Way Strip Surge Protector 2M	11	12.92
QF9PW	6Way Strip Surge Protector 2M	20	23.82
QCNPW	8Way Strip Surge Protector 2M	35	41.12

Gaming Devices

quicklink	LOGITECH	ex VAT	inc VAT
PRMPW	Wingman Formula Force GP USB	52	61.10
MFBPW	Wingman Extreme Digital 3D USB	17	19.97
RVKPW	Wingman Force 3D - Force Feedb	32	37.60

MICROSOFT

quicklink	MICROSOFT	ex VAT	inc VAT
9YCPW	Sidewinder GamePad Pro USB	22	25.85
K5GPW	Sidewinder ForceFeedback Wheel	64	75.20
QR5PW	Sidewinder ForceFeedback 2 USB	59	69.32

Keyboards

quicklink	CHERRY	ex VAT	inc VAT
G5HPW	Soft Touch 105key Win95 PS/2	15	17.62
G5CPW	Soft Touch 105key Win95 AT	15	17.62
G5RPW	83key Mini Keyboard PS/2	39	45.82

LOGITECH

quicklink	LOGITECH	ex VAT	inc VAT
S92PW	Cordless Desktop Keyboard	39	45.82
S93PW	Deluxe Access Keyboard	11	12.92
12P5PW	Internet navigation Keyboard	18	21.15
135PPW	Cordless Desktop iTouch & Mouse	55	64.62

Mice

quicklink	MICROSOFT	ex VAT	inc VAT
ZPMPW	WheelMouse Optical PS/2 USB	15	17.62
Z1XPW	Wireless Intellimouse Explorer	36	42.30
WDBPW	Trackball Explorer USB/PS2	29	34.07
Z1YPW	Intellimouse Explorer USB/PS2	32	37.60

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode

www.dabs.com

[e-mail sales@dabs.com](mailto:sales@dabs.com)

choose from over 16,500 products

GeForce Titanium Cards now Available

AGP Video cards

quicklink	ABIT	ex VAT	inc VAT
XMPW	Siluro MX200 Retail 32MB	38	44.65
XYNPW	Siluro T200 Retail VO 32MB	42	49.35
XYRPW	Siluro T400 Retail VO 64MB	51	59.92
14R1PW	Siluro Ti-200 64MB	107	125.72
17NDPW	Siluro GF4 MX440 64MB ACP AOPEN	82	96.35
177JPW	GF2Ti-V032 32MB	64	75.20
147LPW	GF2Ti-V64 64MB	75	88.12
17QMPW	GF3-Ti200 DV128 128MB	128	150.40
177XPW	GF3-Ti500 DV64 64MB ASUS	233	273.77
17PMPW	GeForce 3 Ti 200 VIVO 64MB	130	152.75
17PQPW	GeForce 4 MX 440 VO 64MB	89	104.57
17PTPW	GeForce 4 Ti 4400 DVI 128MB	239	280.82
17PXPW	GeForce 4 Ti 4400 DVI VO 128MB	250	295.75
17QPPW	GeForce 4 Ti 4600 DVI 128MB	327	384.22
17OQPW	GeForce 4 Ti 4600 DVI VO 128MB CREATIVE	334	392.45
1356PW	GeForce 2 Titanium 64MB	72	84.60
17NBPW	3D Blaster 4 MX 440 VO 64MB	91	106.92
17NCPW	3D Blaster 4 Ti4600 VO 128MB MERCULES	261	306.67
X23PW	3D Prophet 4500 Retail 64MB	84	98.70
X25PW	3D Prophet 4500 Retail VO 64MB	96	112.80
13VNPW	3D Prophet II Titanium Retail VO 64MB	121	142.17
13VQPW	3D Prophet III Ti 200 Retail VO 64MB	177	207.97
13VTPW	3D Prophet III Ti 500 Retail DVI VO 64MB	252	296.10
17RYPW	3D Prophet III All in Wonder 7500 64MB	155	182.12
17SOPW	3D Prophet FOX 8500 LE VO 64MB	129	151.57
1753PW	3D Prophet All in Wonder 8500DV 64MB LEADTEK	230	270.23
18GDPW	WinFast GeForce4 Ti 4400 Retail 128MB	230	270.23
18GFPW	WinFast GeForce4 UltraTi 4600 128MB MATROX	300	352.50
11H5PW	Millenium G550 Dual Retail 32MB	83	97.52
TP2PW	Marvel G450 eTV 32MB VIDEOLOGIC	161	189.17
13WVPW	VIVID! YS Retail 64MB	80	94.00

Sound Cards

quicklink	CREATIVE	ex VAT	inc VAT
130TPW	SoundBlaster 4.1 Digital	23	27.02
130VPW	SoundBlaster 5.1 Digital	45	52.87
113PPW	SB Audigy Platinum eX MERCULES	179	210.32
VCYPW	Game Theatre XP	39	46.32
Y3QPW	Gamesurround Fortissimo II RP	33	38.77
Y3SPW	Gamesurround Muse XL RP ABIT	17	19.97
XV9PW	AU-10R	30	35.25
XVBPW	UA-10	42	49.35
XVCPW	UA-11 AOPEN	39	45.82
YPLPW	Yamaha YMF744 4 Channel PCI	19	22.32
YPMPW	Crystal CS4614 PCI	11	12.92
YPNPW	AOpen AS9200 PCI VIDEOLOGIC	8	9.40
VHOPW	SonicFury PCI OEM	43	50.52
P19PW	SonicFury PCI RP	56	65.80

DVD Drives

quicklink	ASUS	ex VAT	inc VAT
11JVPW	DVD-E616 IDE 16xDVD 40xCD Int AOpen	44	51.70
X99PW	DVD-1648 Pro Bonus IDE 16xDVD 48xCD	48	56.40
16KSPW	DVD-1640 Pro-A Retail IDE 16xDVD 40xCD	48	56.40
16KTPW	DVD-1640 Pro-A BD* IDE 16xDVD 40xCD	45	52.87
16KVPW	RWS120A Bonus Pack	348	408.90
16KWVW	RWS120A BD* (*BareDrive) FREECOM	335	393.62
1223PW	16982 TRAVELLER II Graphite 8xDVD	140	164.50
VGHVW	15877 Starter Kit IDE 16xDVD 48xCD	69	81.07
XT1PW	15116 PORTABLE II Graphite	99	116.32
1631PW	17338 DV+RW LITE-ON	381	447.67
12VTPW	IDE 16xDVD 48xCD Int PANASONIC	38	44.65
12RFPW	SR-8587 IDE 16xDVD 48xCD Int PIONEER	47	55.22
N32PW	DVD-116 IDE 16xDVD Int	46	54.05
X15PW	DVD-1065 IDE 16xDVD Int	54	63.45
14YLPW	DVD-1065 IDE 16xDVD 40xCD	63	74.02
1V6NPW	DVR-A04 IDE 4xDVD 24xCD Int RICOH	346	406.55
13MPPW	MPS120A-DP IDE INT TOSHIBA	325	381.87
136LPW	SD-M1612B OEM IDE 16xDVD 48xCD Int	46	54.05

Radeon 8500™ 64MB DDR AGP Retail Video Out

quicklink **136VWP**

www.dabs.com/ati



- Features ATI's TRUFORM™, SMARTSHADER™, SMOOTHVISION™, and HYPER™ Z II technologies
- The only GPU to support DirectX® 8.1
- Supports OpenGL® 1.3 features
- 64MB of powerful double data rate (DDR) memory

quicklink	ATI	ex VAT	inc VAT
136RPW	RADEON™ 7000 VO 32MB	53	62.27
136TPW	RADEON™ 7500 DVI VO 64MB	95	111.62
136VPW	RADEON™ 8500 DVI VO 64MB	186	218.55
506PW	ALL-IN-WONDER RADEON™ VIVO 32MB	136	159.80

only **£186**
(£218.55)

Pinnacle Studio Deluxe

quicklink **17PYPW**

www.dabs.com



- Create stunning home movies on any format, with any type of video source
- For Windows

quicklink	PINNACLE	ex VAT	inc VAT
PLOPW	Studio PCTV 'Rave' PCI	49	57.57
PKMPW	Studio PCTV PCI	43	50.52
V8PPW	Studio PCTV Sat PCI	99	116.32
Q48PW	Studio DV PCI	66	77.55
Q1TPW	Studio DVplus PCI	129	151.57
Q49PW	microVIDEO Studio DC10plus PCI	105	123.37
DJ4PW	microVIDEO DV200 PCI	219	257.32

only **£209**
(£245.57)

Hauppauge WinTV PVR PCI

quicklink **RHHPW**

www.dabs.com/hauppauge



With its 125-channel cable ready TV receiver, you can watch TV in a resizable window or full screen. Or listen to FM radio with its built-in stereo FM receiver.

quicklink	HAUPPAUGE	ex VAT	inc VAT
X61PW	WinTV Primio FM PCI 793	55	64.62
DHQPW	WinTV FM PCI 747	72	84.60
DHLPW	WinTV Theater PCI 498	89	104.57
DHMPW	WinTV GOI PCI 607	34	39.95
DHNPW	WinTV USB 566	63	74.02
L9CPW	WinTV FM USB 573	80	94.00
L85PW	WinTV DVB-S PCI 717	199	233.82
Q7JPW	DV-Wizard Pro PCI 848	110	129.25
Z9FPW	WinTV Nova-T USB	159	186.82
Z9QPW	WinTV Nova-T PCI	119	139.82

only **£159**
(£186.82)

Dabs value Sis 62326 8MB

quicklink **10MJPW**

www.dabs.com/value



SIS 6326AGP features 8MB of powerful memory and presents leading edge 3D capability.

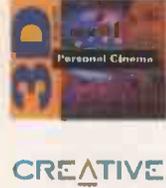
quicklink	dabsvalue	ex VAT	inc VAT
10MJPW	SIS 6326 8MB AGP	12	14.10
111PPW	SIS 6326 8MB PCI	13	15.27
16YSPW	Rage 128 Pro 32MB AGP	23	27.02
14BJPW	Radeon RV100 64MB AGP	35	41.12
10MMPW	GeForce 2 MX 200 32MB AGP	31	36.42
10MNPW	GeForce 2 MX 400 64MB AGP	40	47.00
16Y3PW	Radeon 7500 DVI VO 64MB DDR ACP	65	76.37
17Z3PW	GeForce 4 MX440 VO 64MB DDR ACP	75	88.12
14BYPW	GeForce 2 Ti 64MB AGP	64	75.20
14C2PW	GeForce 3 Ti 200 64MB ACP	91	106.92

only **£12**
(£14.10)

3D Blaster Cinema

quicklink **14RGPW**

www.dabs.com/creative



- 3D Blaster™ Personal Cinema gives users complete control over video editing, TV and 3D gaming
- Full GeForce2™ MX400™ 3D gaming performance

£149
(£175.07)

Abit GeForce3 Ti200

quicklink **14R4PW**

www.dabs.com/abit



- 64MB
- DDR AGP RP VO
- Siluro
- DVI & VideoOut

£107
(£125.75)

GF4 Ti4400 128MB DDR

quicklink **17NBPW**

www.dabs.com/creative



- GeForce4™ graphics for users in search of excellence.
- 128MB DDR AGP RP VO

£211
(£247.92)

Audigy Player PCI

quicklink **113KPW**

www.dabs.com/creative



- HIGH DEFINITION 5.1 multi-channel audio
- Audigy processor and EAX ADVANCED HD
- Connect SB1394 compatible devices
- Gold connectors

£67
(£78.72)

Audigy Platinum

quicklink **113MPW**

www.dabs.com/creative



- Dual SB1394™ digital connectivity
- 24bit and 100dB SNR performance
- Complete digital home recording studio

£134
(£157.45)

GeForce3 Ti 200 64MB

quicklink **136NPW**

www.dabs.com/creative



- Graphics Core: 256-bit
- Memory Interface: 128-bit DDR
- Fill Rate 2.8 Billion AA Samples/Sec.
- Operations per Second: 700 Billion
- Memory Bandwidth: 6.4GB/Sec

£116
(£136.30)

Siluro MX400 64MB

quicklink **XYPPW**

www.dabs.com



- NVIDIA Geforce2 MX400
- 64MB SDRAM (128-bit SDR bus)
- 200MHz Core Speed
- 166MHz RAM Speed
- 640x480@240Hz to 2048x1536@75Hz

£47
(£55.22)

F/wire DVD-RW/CD-RW

quicklink **13DTPW**

www.dabs.com



A unique combination of two optical technologies: DVD-R/RW and CD-RW. This LaCie solution is also a universal reader which can read almost all types of CDs and DVDs.

£413
(£485.27)

DVD-RW Int IDE

quicklink **1Y6NPW**

www.dabs.com



- Removable disk drive
- 4.7GB DVD formatted
- IDE/EIDE
- 1x DVD-R-W 5.25" X 1/2H
- Software- Drivers & Utilities
- 1 year warranty

£346
(£406.55)

Get 5
FREE
Prints

Get amazing prints
& more from YOUR
digital photos

dabs
dabsxpose.com

delivering
technology

quicklinx > shop faster

dabspoints with every purchase

www.dabs.com

700MB CD-R disc 50 pack just £10 (£11.75)



Traveller II Graphite
20r 4w 4rw quicklinx XSHPW

www.dabs.com/freecom

only
£164
(£192.70)

quicklinx	DESCRIPTION	ex VAT	inc VAT
YSRPW	15239 TRAVELLER II Graphite Firewire	24r 8w 4rw	200 235.00
121VWP	16725 TRAVELLER II Graphite Use Cable	20r 4w 4rw	140 164.50
121WWP	16726 TRAVELLER II Graphite Use Cable	24r 8w 4rw	164 192.70
121XPW	15231 TRAVELLER II Graphite Use Cable	24r 8w 4rw	246 289.05
XSNPW	15114 PORTABLE II Graphite Use Cable	32r 8w 4rw	115 135.92
1220PW	15142 PORTABLE II Graphite Use Cable	40r 16w 10rw	123 144.52
14J7PW	15987 PORTABLE II Graphite USB 2.0	40r 24w 10rw	164 192.70
RS4PW	15398 FC CLASSIC USB	6r 4w 4rw	96 112.80
RS5PW	15400 FC CLASSIC Parallel	6r 4w 4rw	96 112.80
1221PW	FREecom DVD-ROM/CD-RW 17033 PORTABLE II Graphite Combo Use Cable	8xDVD-ROM 32r 8w 4rw	164 192.70
XSHPW	FREecom CABLES Series II USB		25 29.37
XSJWP	FREecom CABLES Series II FireWire		37 43.47

FREecom
TECHNOLOGIES

CDW-3200E-VK
40r 24w 10rw Internal

quicklinx 1553PW

www.dabs.com



Trust your important data to Yamaha CD-RW drives. Recordable and ReWritable CDs are the ideal storage media: with up to 700MB or 80 minutes capacity.

YAMAHA

quicklinx	DESCRIPTION	ex VAT	inc VAT
1552PW	YAMAHA CRW-3200 40r 24w 10rw IDE Internal	87	102.22
1553PW	CRW-3200E-810 IDE Internal	95	111.62
1554PW	CRW-3200E-XX IDE Internal	161	189.17
1555PW	CRW-3200SX-VK SCSI External	178	209.15
1556PW	CRW-3200UX-VK KIT USB 2.0 External	163	191.52

Dabsvalue CD-R 50pk

quicklinx 13LXPW

www.dabs.com/value



dabsvalue

- dabs value Silver 80min 700MB CD-Rs
- CDs on spindle (no jewel cases)
- 24x Rated
- Just 20p each (ex VAT)

£10
(£11.75)

CD-RW 40r 24w 10rw

quicklinx ZVKPW

www.dabs.com



LITEON

- IDE/EIDE
- 40x CD/DVD Read
- 32MB min RAM size/min Hard Drive space
- Removable disk drive

£58
(£68.15)

12xDVD-ROM Int

quicklinx 120BPW

www.dabs.com



RICOH

- Buffer memory: 2MB
- Internal E-EIDE (ATAPI) combination drive
- 20x 10x 40x & 12x
- JustLink
- Access time: 100 msec

£123
(£144.52)

Lacie 40r24w10rw

quicklinx 12TXCS

www.dabs.com



LACIE

- Features the new Hi-Speed USB 2.0 Interface.
- Hot swappable
- Complete with the LaCie CD Recording Utilities software suite & USB cable

£125
(£146.87)

PlexWriter 40r40w12w

quicklinx 174GPW

www.dabs.com



PLEXTOR

- The perfect all-in-one product for backup, duplication and all multimedia applications. CDs can be written, rewritten and read on a single unit, and at the highest possible speed.

£105
(£123.37)

Cyclone 40r32w10rw

quicklinx 16VLWP

www.dabs.com



TDK
at the heart of it

- Fitted with BURN-PROOF™ technology to prevent buffer under run errors that would render a CD-R unreadable
- Ensures full PC multitasking even during CD recording

£90
(£105.75)

CD-RW 48r32w12rw

quicklinx 16KQPW

www.dabs.com



AOpen

- IDE Interface
- 2MB Data Buffer memory
- Average access time 100ms
- Writes CD-R at 32x and CD-RW at 12x speed
- Inc. Media & Nero 5x

£79
(£92.82)

CD-RW 40r 40w 12rw

quicklinx 180CPW

www.dabs.com



LITEON

- IDE/EIDE
- 40x CD Read
- 12x CD Rewrite
- Removable disk drive

£83
(£97.52)

CD-RW 40r24w10rw

quicklinx 12NYPW

www.dabs.com



AOpen

- IDE Interface
- 2MB Data Buffer memory
- Average access time 120ms or less
- Writes CD-R at 24x and CD-RW at 10x speed
- Firmware Upgradeable

£64
(£75.20)

CD-ROM Drives

quicklinx	DESCRIPTION	ex VAT	inc VAT
HSCPW	CD952E PRO OEM IDE 52x Internal	20.50	24.08
12NTPW	CD956E PRO Retail IDE 56x Internal	22	25.85
12OSPW	CD-5520 IDE 52x Internal	29	34.07
1224PW	16981 TRAVELLER II Graphite 24x External	71	83.42
XT3PW	15115 PORTABLE II 48x External	58	68.15
HSFPW	FX-4820 OEM IDE 48x Internal	23.50	27.61
9MWPW	UltraPlex PX40TSI RP SCSI 40x Internal	58	68.15
ZZDPW	SC-152 IDE 52x Internal	20	23.50
HSXPW	CD-540E OEM IDE 40x Internal	31	36.42
9PXPW	CD-5525 OEM SCSI 32x Internal	46	54.05
MCJPW	CD-224PEK PCMCIA 24x External	76	89.30

AOpen
52x IDE CD Drive
Internal OEM

Plug & Play
IDE/EIDE Interface
1 Year warranty
128KB Cache/Buffer size

See the full range at
www.dabs.com

£20.50 (£24.08 inc VAT)

24 dabspoints

quicklinx HSCPW

CD-ReWriters

quicklinx	DESCRIPTION	ex VAT	inc VAT
12NYPW	CRW2440 Bonus Pack IDE 40r 24w 10rw	64	75.20
16KSPW	CRW3248 Bare Drive IDE 48r 32w 12rw	76	89.30
16KQPW	CRW3248 Bonus Pack IDE 48r 32w 12rw	79	92.82
16KRPW	CRS446U USB External 6r 4w 4rw	103	121.02
V89PW	FC CLASSIC Write Proof IDE 32r12w10rw	61	71.67
1222PW	FC CLASSIC Write Proof IDE 32r16w10rw	66	77.55
15M2PW	FC CLASSIC Write Proof IDE 40r32w10rw	101	118.67
1409PW	CD-RW 40r 16w 10rw External USB	107	125.72
16YJPW	Predator 32r 24w 10rw External USB	169	198.57
ZVKPW	LTR21018-30YC IDE 40r 24w 10rw Int	58	68.15
15NFPW	LTR32123S IDE 40r 32w 12rw Int	60	70.50
V4YPW	CRD-BP4-M 40r 16w 10rw SCSI Int	107	125.72
YGWPW	CRD-BP1500P-M 40r 24w 10rw IDE Int	70	82.25
136MPW	CR48091E IDE 40r 24w 12rw Internal	58	68.15
130CPW	PCRW1610K 40r16w10rw IDE Internal	53	62.27
175LPW	PCRW2412K 40r 24w 12rw IDE Internal	70	82.25
15HPW	RWDV2010K 12xDVD 40r 20w 10rw Int	103	121.02
ROCPW	PX-W1210S1 32r 12w 10rw SCSI Int	150	176.25
174GPW	PX-W4012TA 40r 40w 12rw Int IDE	105	123.37
13R8PW	PX-S88TU 24r 8w 8rw USB External	183	215.02
R1LPW	MP9120A-DP IDE 8xDVD 32r 12w 10rw	113	132.77
120BPW	MP9200A-DP IDE 12xDVD 40r 20w 10rw	123	144.52
16VLWP	Cyclone IDE 40r 32w 10rw Internal	90	105.75
14JNPW	CD-W54E-002 IDE 40r 24w 10rw Int	77	90.47
14JPPW	CD-W524EK IDE 40r 24w 10rw Int	81	95.17

Pioneer
DVD-RW
Internal IDE
Removable disk drive
4.7Gb DVD formatted
IDE/EIDE
Software- Drivers & Utilities

See the full range at
www.dabs.com

£346 (£406.55 inc VAT)

406 dabspoints

quicklinx VGNPW

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode

www.dabs.com

e-mail sales@dabs.com

choose from over 16,500 products

Athlon XP now available

Processors

quicklink	INTEL Boxed	ex VAT	inc VAT
1064PW	Celeron 1GHz 100MHz	56	65.80
1065PW	Celeron 1.10GHz 100MHz	61	71.67
131XPW	Celeron 1.2GHz 100MHz	70	82.25
1603PW	Celeron 1.3GHz 100MHz	74	86.95
1557PW	Pentium III 1.13GHz 133MHz	102	119.85
097PW	Pentium III 1.13GHz 133MHz	117	137.47
1558PW	Pentium III 1.26GHz 133MHz	129	151.57
096PW	Pentium III 1.26GHz 133MHz	148	173.90
AMD			
X6LPW	Athlon™ 1.4GHz 266MHz	82	96.35
12NPPW	AthlonXP 1500+1.35GHz 266MHz	85	99.87
12NQPW	AthlonXP 1600+1.4GHz 266MHz	89	104.57
12NRPW	AthlonXP 1700+1.47GHz 266MHz	89	104.57
12NSPW	AthlonXP 1800+1.53GHz 266MHz	96	112.80
13TJPW	AthlonXP 1900+1.6GHz 266MHz	121	142.17
1605PW	AthlonXP 2000+1.67GHz 266MHz	179	210.32
1Y2MPW	AthlonXP 2100+1.73GHz 266MHz	221	259.67

AMD Duron 1GHz Socket A

quicklink **10K4PW** **AMD**
www.dabs.com/amd



Offering value-minded buyers access to technology that stands out among that of other processors in its class. Its innovative architectural features deliver remarkable performance across many of today's standard and data-rich applications



quicklink	AMD	ex VAT	inc VAT
SWPW	Duron 850 200MHz	32	37.60
WKGPW	Duron 900 200MHz	35	38.77
XPSPW	Duron 950 200MHz	34	39.95
14H5PW	Duron 1.2GHz 200MHz	50	58.75

only **£39**
(£45.82)

Pentium 4 Processor 1.8GHz Socket 478

quicklink **1600PW**
www.dabs.com/intel



Intel's most powerful processor.

quicklink	INTEL	ex VAT	inc VAT
1066PW	Pentium 4 1.7GHz Socket 478	146	171.55
1066PW	Pentium 4 1.8GHz Socket 478	172	196.22
1066PW	Pentium 4 1.9GHz Socket 478	197	242.05
1066PW	Pentium 4 2.0GHz Socket 478	248	291.40
1562PW	Pentium 4 2.0GHz Socket 478	249	292.57
1565PW	Pentium 4 2.2GHz Socket 478	368	432.40



UDMA Hard Disks

quicklink	ExcelStore	ex VAT	inc VAT
10WMPW	20.4 UDMA66 5400RPM	48	56.40
FUJITSU			
10Q3PW	PicoBird 16 40.9 UDMA100 7200RPM	87	102.22
Maxtor			
Z0HPW	541DX 20.0 5400RPM	49	57.57
Z0TPW	D540X 40.0 5400RPM	58	68.15
Z0VPW	D540X 60.0 5400RPM	72	84.60
Z0WPW	D540X 80.0 5400RPM	88	103.40
Z10PW	D540X 120.0 5400RPM	137	160.97
Z211PW	D540X 160.0 5400RPM	196	230.30
WESTERN DIGITAL			
10LWPW	Protege 20.0 5400RPM	54	63.45
10LZPW	Caviar 60.0 5400RPM	76	89.30

SCSI Hard Disks

quicklink	IBM Ultrastar	ex VAT	inc VAT
16TKPW	73LZX Ultra 160 18.3 10000RPM	155	182.12
16TMPW	73LZX Ultra 160 36.7 10000RPM	288	338.40
16TSPW	73LZX Ultra 160 73.4 10000RPM	610	716.75
16TXPW	36215 Ultra 160 18.4 15000RPM	236	277.30
Maxtor			
1373PW	Atlas 10k III Ultra 160 18.4 10000RPM	145	170.37
1375PW	Atlas 10k III Ultra 160 36.7 10000RPM	254	274.95
1375PW	Atlas 10k III Ultra 160 73.4 10000RPM	519	609.82

Notebook Hard Disks

quicklink	FUJITSU	ex VAT	inc VAT
10Y7PW	MHN 20.0 UDMA100 4200RPM	68	79.90
10Y9PW	MHN 30.0 UDMA100 4200RPM	98	115.15
IBM Ultrastar			
ZZ5PW	Travelstar 15CN 10.0 UDMA100 4200RPM	56	65.80
ZZ7PW	Travelstar 30CN 20.0 UDMA100 4200RPM	73	85.77
ZZ9PW	Travelstar 48CN 48.0 UDMA100 5400RPM	257	301.97
16W0PW	Travelstar 40CN 20.0 UDMA100 4200RPM	73	85.77

MEMORY

quicklink	SONY	ex VAT	inc VAT
J7KDC	Memory Stick 64MB	38.00	44.65
YZVDC	Memory Stick 128MB	69.00	81.07
DABSVLUE			
KNJDC	64MB CompactFlash	21.00	24.67
LNODC	64MB Smartmedia	19.00	22.32
Z0CDC	128MB Smartmedia	39.00	45.82

128MB CompactFlash™

Exceptional value memory Store even more photos on your Digital Camera

£38 (£44.65)

quicklink **KTKDC**

See the full range at www.dabs.com/value

Crucial 256MB 184 Pin DIMM PC2100 DDR-RAM

quicklink **1WVLPW**
www.dabs.com/crucial



see web

- 256MB
- 184Pin DIMM
- PC2100 DDR RAM
- Non-Parity CL2.5



The right memory at the right price. Just one reason why the world's leading computer manufacturers buy their memory from Crucial.

IBM Deskstar 120GXP 41.2GB UDMA100

quicklink **15BDPW**
www.dabs.com



- 41.2GB IDE Hard Disk Drive
- 7200rpm
- 8.5ms
- 3 Year Warranty



quicklink	IBM	ex VAT	inc VAT
WQJPW	Deskstar 60GXP 41.2 7200	65	76.37
18F1PW	Deskstar 120GXP 61.5 7200	78	91.65
15BDPW	Deskstar 120GXP 41.2 7200	65	76.37
15BPPW	Deskstar 120GXP 82.3 7200	97	113.97
15BGPW	Deskstar 120GXP 123.5 7200	170	199.75

only **£53**
(£62.27)

256MB 168 Pin DIMM PC133 SDRAM

quicklink **SHVPW**
www.dabs.com/crucial



- 32M x 64 Non Parity Unbuffered CL3

BEST BUY

quicklink	PC100 SDRAM	ex VAT	inc VAT
SCTPW	128MB 168 Pin DIMM 16Mx64 Non Parity 8ns Unbuffered CL2	-	see web
SGXPW	256MB 168 Pin DIMM 32Mx64 Non Parity 8ns Unbuffered CL2	-	see web
PC133 SDRAM			
SHVPW	128MB 168 Pin DIMM 16Mx64 Non Parity 7.5ns Unbuffered CL3	-	see web
SHHPW	128MB 168 Pin DIMM 16Mx64 Non Parity 7.5ns Unbuffered CL2	-	see web
SHWPW	256MB 168 Pin DIMM 32Mx64 Non Parity 7.5ns Unbuffered CL2	-	see web

DiamondMax Plus D740X 40.0GB 7200rpm

quicklink **1214PW**
www.dabs.com/Maxtor



Expand your computer's storage capacity with the high performance DiamondMax Plus D740X hard drive from Maxtor.

- 8.5ms Access
- 2MB Cache
- 3 year warranty



quicklink	MAXTOR DiamondMax Plus D740X	ex VAT	inc VAT
1213PW	20.0 UDMA133 7200 rpm	58	68.15
1214PW	40.0 UDMA133 7200 rpm	65	76.37
1215PW	60.0 UDMA133 7200 rpm	82	96.35
1216PW	80.0 UDMA133 7200 rpm	99	116.32

only **£152**
(£178.60)

Seagate U6 20410 20GB 5400rpm

quicklink **20XPW**
www.dabs.com/seagate



- 512KB Cache
- 8.9ms
- 3 Year Warranty
- Picture for illustrative purposes only



quicklink	SEAGATE	ex VAT	inc VAT
Z0XPW	U6 20410 20.0 UDMA100 5400rpm	53	62.27
Z0ZPW	U6 40810 40.0 UDMA100 5400rpm	56	65.80
Z10PW	U6 60020 60.0 UDMA100 5400rpm	69	81.07
Z11PW	U6 80020 80.0 UDMA100 5400rpm	97	113.97
1012PW	Barracuda ATA IV 40.0 UDMA100 7200rpm	64	75.20
1020PW	Barracuda ATA IV 60.0 UDMA100 7200rpm	81	95.17
1021PW	Barracuda ATA IV 80.0 UDMA100 7200rpm	102	119.85

Caviar 120.0GB 7200rpm

quicklink **12NLPW**
www.dabs.com



- Seek Time 8.9ms
- 2MB Memory
- UDMA 100
- Spindle Speed 7200rpm
- 3 year warranty



quicklink	WESTERN DIGITAL	ex VAT	inc VAT
10M1PW	Caviar 20.0GB	57	66.97
10M3PW	Caviar 40.0GB	66	77.55
10M4PW	Caviar 60.0GB	84	98.70
10M5PW	Caviar 80.0GB	99	116.32
10M6PW	Caviar 100.0GB	141	165.67
12NLPW	Caviar 120.0GB	152	178.60



'lowest priced Zip discs'

iomega Zip 250MB disc 4 pack for PC

quicklinx JC9PW

www.dabs.com/iomega

iomega

£39 (£45.82)

delivering technology

quicklinx >shop faster

dabspoints with every purchase

www.dabs.com

Socket A motherboards from £42 (£49.35)

Abit KR7A-133R KT266A Socket A ATX Motherboard

www.dabs.com



ABIT's highly anticipated Socket A motherboard has arrived.

- Four 184-pin DIMM
- PC1600/PC2100 DDR SDRAM
- SoftMenu™ III Technology
- 1 AGP
- 6 PCI



Iomega Zip 250 USB Host Powered

quicklinx I13LYPW

www.dabs.com/iomega



- The quick way to save, share and manage your information
- Connects to any USB port or notebook PC
- Hot-swappable
- Media not included

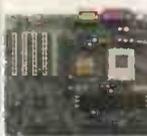


quicklinx	IOMEGA	ex VAT	inc VAT
100BPW	Peerless USB 200B Bundle	289	339.57
109PPW	Zip 100MB Kit inc 3 disk	60	70.50
10BPBW	Zip 100MB Host Powered	50	58.75
10PCPW	Ultimate Slim Zip 100MB Host Powered	65	76.37

Socket A KT133A

quicklinx WKMPW

www.dabs.com



- ATX
- 3DIMM
- 5PCI
- OISA
- AGP4x
- UDMA100



£67 (£78.72)

SL-75DRV5 VIA KT333A

quicklinx I182VPW

www.dabs.com



- 3DDR
- 5PCI
- 333Mhz
- OISA
- AGP 4x
- U133, Audio



£84 (£98.70)

Socket A AMD 761/VIA

quicklinx I17NHPW

www.dabs.com



- GA-7DX+
- ATX
- 2xDDR RAM DIMM
- 5PCI
- OISA
- AGP 4x
- UDMA
- 1 Year Warranty



£66 (£77.55)

Trackball Explorer

quicklinx IWBPPW

www.dabs.com/microsoft



- Operated using the finger, rather than the thumb
- Programmable forward and back buttons for easier web navigation
- Scroll & zoom directly from your trackball.



£35 (£41.12)

Midi Tower KOB-24

quicklinx I14WQPW

www.dabs.com/value



- 3xExt 5.25"
- 2xExt 3.5"
- 1xInt 3.5"
- AMD/P4 PSU



£25 (£29.37)

Full Tower ATX (Blue)

quicklinx I17KPPW

www.dabs.com



- 300W
- ATX12V PSU for P4
- 42 x 41.4 x 19.8cm
- 1 Year Warranty



£70 (£82.25)

1.44MB Internal Drive

quicklinx IFSQPW

www.dabs.com



- Cream/White
- 3.5" standard model Floppy disk drive
- 1 Year Warranty



£6.50 (£7.63)

USB ModemBlaster

quicklinx I16Q5PW

www.dabs.com/creative



- Simple, reliable and fast access to the world of online entertainment.
- Data, fax and voice capability.
- V.90 support as standard.
- V.92* compliant via free driver upgrade.



£42.50 (£49.93)

H600A Super Tower

quicklinx I14P1PW

www.dabs.com



- 300W
- ATX/microATX/Full AT 5.25" x 4/0, 3.5" x2/1 (external/Internal)
- 3.5" HDD cage x2(option)



£58 (£68.15)

quicklinx I16P2PW

only £114 (£133.95)

quicklinx	ABIT	ex VAT	inc VAT
167RPW	B07 Intel 845D Socket 478 ATX	96	112.80
167SPW	S07-533 SIS 645 Socket 478 ATX	81	95.17
TNCPW	K7A VIA KT133A Socket A ATX	62	72.85
TNDPW	K7A-RAID VIA KT133A Socket A ATX	76	89.30
14VQPW	K7A KT266A Socket A ATX	89	104.57
YVQPW	K7A-RAID KT266A Socket A ATX	108	126.90
16P1PW	K7A-133 KT266A Socket A ATX	97	113.97
ZTSPW	KG7-LITE AMD 761 Socket A ATX	75	88.12
YVHPW	KG7 AMD 761 Socket A ATX	81	95.17
YVJPPW	KG7-RAID AMD 761 Socket A ATX	86	101.05
16G7PW	SoA nForce 420D A MATX	112	131.60

CREATIVE
Modem Blaster V.92 PCI
Internal Data, Fax and Voice Capability. Speed, Flexibility and Reliability.
See the full range at www.dabs.com/creative

£34 (£39.95 inc VAT)
39 dabspoints

NETGEAR
Broadband Router RP114
100 Mbps Fast Ethernet TCP/IP, PPTP 1x network external
See the full range at www.dabs.com/netgear

£69 (£81.07 inc VAT)
81 dabspoints

Motherboards

quicklinx	AOPEN	ex VAT	inc VAT
155CPW	MX34-U VIA 694T FC-PCGA2 MATX	49	57.57
155KPW	AX48 Intel 845D Socket 478 ATX	94	110.45
155LPW	AX48 Pro Intel 845D Socket 478 ATX	101	118.67
160ZPW	MX48 Intel 845D Socket 478 MATX	93	109.27
155QPW	AX4TII Intel 850 Socket 478 ATX	102	119.85
155RPW	AX45-V SIS 645 Socket 478 ATX	69	81.07
1101PW	AK73(A) VIA KT133A Socket A ATX	49	57.57
WKMPW	AK73 Pro(A) VIA KT133A Socket A ATX	67	78.72
Y6KPW	AK73-139(A) VIA KT133A Socket A ATX	78	91.65
155SPW	AK77 Plus(A) VIA KT266A Socket A ATX	88	103.40
1102PW	AK77 Pro(A) VIA KT266 Socket A MATX	62	72.85

quicklinx	ASUSTEK	ex VAT	inc VAT
16VBPW	TUSI-M SIS 630ET FC-PCGA2 MATX	51	59.92
13VFPW	P4T-E Intel 850 Socket 478 ATX	137	160.97
15FPWP	P4B266/Audio Intel845D Socket478 ATX	132	155.10
15FPQW	P4S333/Audio SIS 645 Socket 478 ATX	80	94.00
108YPW	A7M266-D AMD 760MPX 2xSocket A ATX	196	232.65

quicklinx	GIGABYTE	ex VAT	inc VAT
135XPW	CA-6VTXE VIA 694T FC-PCGA2 ATX	53	62.27
136PPW	CA-8ITXE Intel 850 Socket 478 ATX	89	104.57
1632PW	CA-BIRX Intel 845D Socket 478 ATX	91	106.92
16P4PW	CA-BIRXP Intel 845D Socket 478 ATX	125	146.87
1633PW	CA-BIRM Intel 845D Socket 478 MATX	83	97.52
16P6PW	CA-BIRML Intel 845D Socket 478 MATX	86	101.05
16P7PW	CA-BSRX SIS 645 Socket 478 ATX	78	91.65
16P8PW	CA-BSDX SIS 645 Socket 478 ATX	68	79.90
136FPW	CA-7XEH VIA KT133E Socket A ATX	42	49.35
2HNPPW	CA-7ZMMH VIA KM133A Socket A MATX	67	78.72
16PBPW	CA-7VTXE+ VIA KT266A Socket A ATX	72	84.60
16PDPW	CA-7VTKH+ VIA KT266A Socket A ATX	83	97.52
17NHPW	CA-7ZXE VIA KT133A Socket A ATX	59	69.32
1XVPPW	CA-7DXR AMD 761/VIA Socket A ATX	89	104.57
16PNPW	CA-7DXR+ AMD 761/VIA Socket A ATX	85	99.87
16Q3PW	CA-7DPXDW AMD 762 2xSocket A ATX	227	266.72

quicklinx	JETWAY	ex VAT	inc VAT
14J1PW	I401 Intel 845 S478 ATX	78	91.65
14J2PW	B30CH SIS 7305 Socket A MATX	47	55.22
128CPW	MS6309 694T PRO-LE VIA 694X ATX	56	55.22
13TNPW	MS6545 850 PR05 intel 850 ATX	104	122.20
13TPPW	MS6330 K7T Turbo KT133A ATX	64	75.20
13TPQW	MS6380 K7T Pro2RU KT266A ATX	97	113.97
13TSPW	MS6380 K7T Pro2 KT266A ATX	82	96.35
13V1PW	MS6373 K7N420 PRO nForce ATX	99	116.32

quicklinx	SOLTEK	ex VAT	inc VAT
16XVPW	SL-75LV VIA KLE133 Socket A MATX	52	61.10
11V5PW	SL-75KAV VIA KT133A Socket A ATX	59	69.32
11V6PW	SL-75DRV VIA KT266 Socket A ATX	62	72.85
16XPPW	SL-75DRV4 VIA KT266A Socket A ATX	76	89.30

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode



www.dabs.com

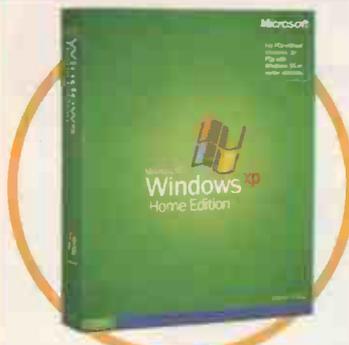
e-mail sales@dabs.com

choose from over 16,500 products

check our website for over 2000 software lines

PC Software

quicklink	ACCOUNTING	ex VAT	inc VAT
14YPPW	Intuit QuickBooks 2002 Standard	89	104.57
14YQPW	Intuit QuickBooks 2002 Pro	175	205.62
151WPW	Quicken 2002 Deluxe	39	45.82
151VPW	Quicken 2002 Standard	21	24.67
2P6PW	MS Money 2002 Standard	18	21.15
2P8PW	MS Money 2002 Deluxe	29	34.07
W6YVPW	MYOB Accounting	159	186.82
W6ZPW	MYOB Accounting Plus	239	280.82
11HFPW	Sage Accountant v8	575	675.62
17XDPW	Sage Instant Accounts v8	105	123.37
87FPW	Sage Accountant Plus v7.0	575	675.62
17XCPW	Sage Instant Payroll v8	84	98.70
ANTIVIRUS/SECURITY			
1Y6HPW	Total Virus Defense 5-user 2yr	229	269.07
PFPWP	McAfee Total Virus Def 10Node 2yr	429	504.07
10NDPW	McAfee VirusScan v6.0 Classic	20	23.50
10NFPW	McAfee VirusScan Professional v6.0	21	24.67
15FMWP	Symantec Norton Antivirus SB 5-user	189	222.07
27NWP	Symantec Norton Internet Security Std	39	45.82
BACKUP			
15JQPW	Dantz Retrospect v5.5 Wgroup Ed	255	299.62
15OBPW	Orlogix Backup myPC v4.7	49	57.57
YR4PW	Roxio GoBack v3	24	28.20
10H8PW	Symantec Norton Ghost 2002	33	38.77
CAD			
XZBPW	AutoCAD LT2002	535	628.62
420TPW	Autodesk Volo View	119	139.82
15B6PW	Autodesk AutoSketch v8.0	125	146.87
COMMUNICATIONS			
14LFPW	Laplink Gold v11	99	116.32
15W6PW	Laplink PC Sync	45	52.87
14PGPW	Symantec PC Anywhere H+R v10.5	115	135.12
M5LPPW	Symantec Procomm Plus v4.8	69	81.07
LG9PW	Symantec WinFax Pro v10.0	41	48.17
CONTACT MANAGEMENT			
WVDPW	Microsoft Outlook 2002	79	92.82
16ZRPW	Act! + Bonus Pack	119	139.82
16ZSPW	Act! 5 User + Bonus Pack	529	621.57
DATABASES			
XW8PW	Filemaker Pro v5.5	195	229.12
WV4PW	MS Access 2002	239	280.82
Y83PW	MS Visual FoxPro Pro v7.0	345	405.37
DIAGRAMMING			
WMPPW	Visio Standard 2002	125	146.87
WMRPW	Visio Professional 2002	305	358.37
DTP			
N14PW	Adobe FrameMaker v6	599	703.82
13NPPW	Adobe InDesign v2.0	549	645.07
XZ0PW	Adobe Pagemaker v7	370	434.75
15SWPW	Adobe Publishing Collection v11	759	891.82
16M0PW	Adobe Design Collection v5	755	887.12
W1NPPW	MS Publisher 2002	85	99.87
1741PW	Quark Xpress v5	969	1138.57
GRAPHICS			
VS4PW	Adobe Acrobat v5.0	165	193.87
W1SPW	Adobe After Effects v5.0	505	593.37
10D7PW	Adobe Dimensions v3.0	89	104.57
113NPPW	Adobe Illustrator v10	295	346.62
17V8PW	Adobe Photoshop v7	449	527.57
VKZPW	Adobe Photoshop Elements	57	66.97
SVXPW	Adobe Premiere v6	415	487.62
Q1JWPW	Adobe Type Manager Deluxe v4.1	44	51.70
QHRPW	Corel Draw v10	295	346.62
8PRPW	Extensis QX Tools v4.0	99	116.32
QRWPW	Extensis Suitcase 9 Desktop	52	61.10
10CZPW	JASC Paintshop Shop Pro Anniversary	57	66.97
WVZPW	Macromedia Freehand v10.0	305	358.37
XJRPW	Micrografix Picture Publisher	45	52.87
WVFPW	MS Powerpoint 2002	239	280.82
INTEGRATED PACKAGES/OFFICE			
NJXPW	Office XP Standard	345	405.37
WJQPW	Office XP Professional	435	511.12
WJVPW	Office XP Standard Upgrade	155	182.12
WK0PW	Office XP Professional Upgrade	209	245.57
12JLPPW	Office XP Student	85	99.87
WP3PW	MS Personal Portfolio 2002	15	17.62
ZPLPW	MS Personal Collection 2002	29	34.07
P1WPW	MS Works v6	47	55.22
YXXPW	MS Works Suite 2002 Inc. Word 2002	69	81.07
OCR			
W76PW	Abby Fine Reader Pro	39.99	46.98
Y8BPW	Scansoft OmniPage Pro v11	295	346.62
NW4PW	Scansoft Scansuite Plus v10.0	315	370.12
P8LPW	Scansoft TextBridge Pro Millenium	39	45.82
OPERATING SYSTEMS			
16VPW	MS Windows 98 2nd Edition Full	108	126.90
ZZ2PW	MS Windows 98 2nd Edition Upgrade	62	72.84
P1TWP	MS Windows ME Win 98 Upgrade	59	69.32
N29PW	MS Windows ME FULL	115	135.12
JLQPW	MS Windows 2000 server	709	833.07



Windows XP Home Edition Upgrade

www.dabs.com/microsoft

only
£69
(£81.07)

Unlock the full potential of your personal computer with Windows XP Home Edition. Windows XP Home Edition gives you the freedom to experience more than you ever thought possible with your home computer and the Internet. If you've always imagined you could do more with your computer, your vision is about to become reality. From digital photos, music, and video to building a home network, Windows XP Home Edition brings you into the digital age with ease.

A new visual design, a new Windows engine and new Internet security features combine with capabilities for sharing your computer and keeping it in shape.

quicklink	MICROSOFT	ex VAT	inc VAT
ZL4PW	Windows XP Home - Full Version	139	163.32
ZL6PW	Windows XP Professional	199	233.82
ZL7PW	Windows XP Professional Upgrade	135	158.62

Microsoft

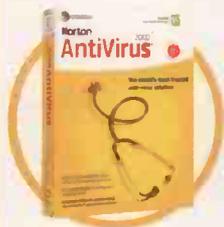
Norton Antivirus 2002

www.dabs.com/symantec

The world's leading anti-virus software



only
£34
(£39.95)



Norton Antivirus™ is the world's leading antivirus software. Just install it and forget it! It's always working in the background to protect your PC

Adobe Acrobat v5

www.dabs.com/adobe

Adobe Acrobat 5.0 software lets you convert any document to an Adobe Portable Document Format (PDF) file.



only
£165
(£193.87)



- Convert any document into a PDF file
- Easy to use
- Share documents across the web
- Allows reviewers to add comments
- Secure your documents

Internet Security 2002

www.dabs.com/symantec



Norton Antivirus™ is the world's leading anti-virus software. Just install it and forget it! It's always working in the background to protect your PC.

£39
(£45.82)

PaperPort Deluxe v8

www.dabs.com



This new version of PaperPort Deluxe brings static paper documents into the digital environment enabling you to organise, retrieve and use paper documents.

£49
(£57.57)

Photoshop Elements

www.dabs.com

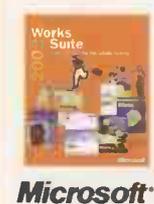


Powerful yet easy-to-use digital imaging solution designed specifically for amateur photographers, hobbyists, and business users

£57
(£66.97)

Works Suite 2002

www.dabs.com/microsoft



Combines six complete products, including the latest version of Microsoft Word - a great value for a great price.

£69
(£81.07)

Linux Professional v8

www.dabs.com



Innovative, state-of-the-art Linux technology, bundled with convenience of use - is unmatched by any other operating system.

£35
(£41.12)

ViaVoice Pro v9.0

www.dabs.com



Now your voice becomes a premier productivity tool. With IBM ViaVoice for Windows Pro Edition, you can simplify the creation of letters, briefs, memos and faxes.

£65
(£76.37)

Paint Shop Pro Anniv.

www.dabs.com



Retouch, repair, and edit photos. Create and optimize Web graphics. Design cool animations. Easily add custom images. Share photos electronically.

£35
(£41.12)

Nero v5.5

www.dabs.com

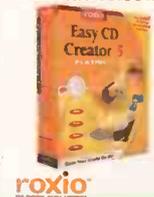


Nero 5.5 adds several significant enhancements including a complete and non-destructive audio editor, the ability to create compatible MPEG data for Video CD recording.

£35
(£41.12)

Easy CD Creator v5.0

www.dabs.com



Specifically designed to provide an optimized solution for the most demanding value conscious business & home users, without compromising their budgets.

£32
(£37.60)



visit our software download store
download hundreds of software titles available now
www.dabs.com/downloadshop

delivering technology

quicklinx >shop faster

corporate sales 0870 429 3010

www.dabs.com

great software - great prices



Flash MX

quicklinx 17W3PW

www.dabs.com/macromedia

Macromedia Flash MX provides everything you need to create and deliver rich Web content and powerful applications. Whether you are designing motion graphics or building data-driven applications, Flash MX has the tools you need to produce great results and deliver the best user experiences across multiple platforms and devices.

quicklinx	MACROMEDIA	ex VAT	inc VAT
RP1PW	DreamWeaver v4	215	252.62
WV2PW	Freehand v10	305	358.37
1YM0PW	DreamWeaver MX	299	351.32
17W5PW	Flash MX Upgrade	145	170.37
RPSPW	Fireworks v4	219	257.32



only
£365
(£428.87)

visit our online shop to see live stock displays, up to the minute pricing, product information and special offers



PC Software

quicklinx	OPERATING SYSTEMS cont...	ex VAT	inc VAT
JLRPW	MS Windows 2000 Professional	229	269.07
1233PW	Mandrake Linux v8.1 Standard	18	21.15
1YHLPW	Mandrake Linux v8.2 Standard	27	31.72
12VCPW	Red Hat LINUX v7.2 Deluxe	49	57.57
12VHPW	Red Hat LINUX v7.2 Professional	119	139.82
1Y0GPW	SuSe Linux v8 Personal	25	29.37
1Y0HPW	SuSe Linux v8 Professional	35	41.12
PROGRAMMING			
XW5PW	Borland Delphi v6.0 Personal	69	81.07
XW7PW	Borland Delphi v6.0 Professional	599	703.82
145NPW	Borland JBuilder v6 Personal	39	45.82
145LPW	Borland JBuilder v6 Professional	579	680.32
W7WHPW	Borland Kylix Desktop Dev Ed	345	405.37
ZPJPW	MSDN Universal Subscription	1615	1897.62
ZPCPW	MSDN Professional Subscription	689	809.57
159PPW	MS Visual Basic .NET Standard	75	88.12
159XPW	MS Visual C++ .NET Standard	75	88.12
K68PW	MS Visual Interdev v6.0	339	398.32
163PW	MS Visual J++ v6.0	65	76.37
15B2PW	MS Visual Studio .NET Standard	639	750.82
REFERENCE			
YXMPW	MS Encarta 2002 Reference Suite	21	24.67
YXNPW	MS Encarta 2002 Reference Suite DVD	21	24.67
YXLPW	MS Encarta 2002 Deluxe	19	22.32
YXGPW	MS Encarta 2002 Standard	10	11.75
ROUTING			
YXKPW	MS Autoroute 2002 Europe	41	48.17
WXPWPW	Route 66 Britain 2001 STS	17	19.97
SPEECH RECOGNITION			
ODPPW	Dragon Nat Speak Essential	17	19.97
QHPPW	IBM ViaVoice v8.0 Standard	29	34.07
QHQPW	IBM ViaVoice v8.0 Pro	62	72.85
ODQPW	L and H VoiceXpress Standard	25	29.37
OS4PW	L and H VoiceXpress Advanced	45	52.87
SPREADSHEETS			
WMHPW	MS Excel 2002	239	280.82
UTILITIES			
VPBPW	Nero v505 CD Burning	35	41.12
11D3PW	Ontrack Fix-It Utilities v4	23	27.02
11D4PW	Ontrack SystemSuite v4	32	37.60
YVPWPW	Power Quest DriveCopy v4	27	31.72
11FBPW	Power Quest Drive Image v5.0	35	41.12
10W2PW	Power Quest Partition Magic v7.0	35	41.12
16V1PW	Roxio Easy CD Creator v5 Platinum	32	37.60
10HBPW	Symantec Norton Ghost 2002	33	38.77
ZNFPW	Symantec Norton CleanSweep 2002	24	28.20
ZNBPW	Symantec Norton Utilities 2002	27	31.72
10GLPW	Norton SystemWorks 2002 Std	49	57.57
10GSPW	Norton SystemWorks 2002 Pro	63	74.02
WORD PROCESSING			
WMGPW	MS Word 2002	239	280.82
YXCPW	MS Works Suite 2002 inc. Word 2002	69	81.07
WEB PUBLISHING/SHOPS			
M5GPW	Adobe Golive v5.0	225	264.37
163HPW	Adobe Golive v6 Windows	279	327.82
13RDPW	Equology E-Commerce Edition	29	34.07
WV8PW	MS FrontPage 2002	109	128.07
17XRPW	Namo Web Editor v5	59	69.32
SR9PW	NTM WEB! Professional Edition	29	34.07
133WPW	Serif Web Plus v7	23	27.02
VIDEO EDITING			
SVXPW	Adobe Premier	415	487.62
ZLCPW	MGI VideoWave DV Suite	62	72.85
YBRPW	MGI VideoWave v5	55	64.62
YZ1PW	Pinnacle Studio v7	49	57.57
13PJPW	Ulead DVD Movie Factory	28	32.90

VirusScan v6 Standard

quicklinx 10NDPW



only
£20
(£23.50)

www.dabs.com/mcafee

McAfee VirusScan is the only anti-virus solution to monitor for malicious activity and protect your computer from the latest virus threats.



- floppy disks
- e-mail attachments
- shared files
- online services
- internet downloads

quicklinx	MCAFFEE	ex VAT	inc VAT
10NFPW	VirusScan v6 Deluxe	25	29.37
1Y6HPW	Total Virus Defense 5-user 2 year	229	269.07

Quicken 2002 Standard

quicklinx 151VPW



only
£21
(£24.67)

www.dabs.com/intuit

Complete financial management for you and your business. The smarter way to comprehensive personal financial planning made easy



- New in 2002
- Simplify and organise your personal finances

quicklinx	INTUIT	ex VAT	inc VAT
151WPW	Quicken 2002 Deluxe	39	45.82
151XPW	Quicken 2002 Home and Business	49	57.57
14YPPW	QuickBooks 2002 Standard	89	104.57
14YQPW	QuickBooks 2002 Pro	175	205.62

AutoCAD LT2002

quicklinx XZBPW

only
£535
(628.62)

www.dabs.com/autodesk

The future of CAD is here - If you're not using the latest Autodesk design software, you're working in the past.

New timesaving drawing tools minimize the number of steps you have to take, freeing you and your team to explore more design options and create even more outstanding designs.



quicklinx	AUTODESK	ex VAT	inc VAT
XZCPW	AutoCAD LT 2002 Upgrade	159	186.82

Corel Draw v10

quicklinx QHRPW



only
£285
(£334.87)

www.dabs.com/corel

A comprehensive graphics solution that delivers vector illustration, layout, bitmap creation, image-editing, painting and animation all in one package!



Includes
KPT 6
& more

- customizable UI
- easier-to-use colour management
- enhancements to drawing tools
- easier navigation
- Web Image Optimizer
- re-engineered preflight engine

Partition Magic v7

quicklinx 110W2PW



only
£35
(£41.12)

www.dabs.com

Manage disks and run multiple operating systems.



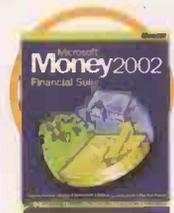
- Create
- Resize
- Split
- Merge
- Undelete
- Convert partitions
- All without destroying data!

Microsoft Money 2002 Financial Suite

quicklinx ZP8PW

at only
£29
(£34.07)

www.dabs.com/Microsoft



- Manage today's finances, achieve tomorrow's goals.
- Microsoft Money 2002 is an easy to use personal finance management software application that helps people manage their personal finances, to include balancing a chequebook, budgeting, reducing debt, planning for the future and managing your investments and taxes

Palm Software

quicklinx	PALM SOFTWARE	ex VAT	inc VAT
13MSPW	Dataviz Documents to go v4	65	76.37
42DPW	Dataviz Desktop to Go	42	49.35
12XPPW	Laplink PDA Synchron	19	22.32
1743PW	Map & Guide GB 2002 for Palm PCC	18	21.15
V18PW	PalmSpring Pocket Money	16	18.80
Z7JWPW	Puma Intellisynch v4	45	52.87

Mac Software

quicklinx	APPLE	ex VAT	inc VAT
1276PW	Apple Mac OS X v10.1	78	91.65

Student Software

quicklinx	SOFTWARE	ex VAT	inc VAT
12JLPW	Microsoft Office XP	85	99.87
TMCPCW	Microsoft Windows 2000/ME	39	45.82
MKCPW	Microsoft Developer Tools	62	72.85
13THPW	Symantec SystemWorks	25	29.37

To see our full listing of software for Mac OS please visit...
www.dabs.com/MSD

FREE UK carriage on all online orders over £75*

*On all orders over £75 ex VAT (£88.12 inc VAT) made over the Internet at www.dabs.com, placed from and delivered to a UK postcode

Get ready for your holidays with dabs.com

Cameras

HP 812 Digital Camera

quicklink > 1Y1DFW



£299
(£351.32)

- 4 Megapixel Digital Camera
- Exceptional image quality
- Easy-to-use
- Destination pre-selection
- HP Instant Share
- Docking station (optional)

Canon Powershot A40

quicklink > 1Y35PW



£225
(£264.37)

- 2.0 Megapixel
- 3x Optical Zoom
- 2.5x Digital zoom
- Movie Mode
- Flash Modes: Fill-in mode, slow synchro, auto mode, flash OFF mode, red-eye reduction

Portable Audio

Creative 10GB Jukebox

quicklink > 17T8PW



£195
(£229.12)

- 10GB hard drive stores over 170 hours of near CD-quality audio, or over 250 albums and thousands of personal play lists
- Supports 4-channel surround sound
- Offers MAC OS Support

Sony MZ-N505S MiniDisc Walkman

quicklink > 1752PW



£135
(£158.62)

- Network MiniDisc Walkman
- High speed data transfer from PC
- C-Protection Jog Proof
- Remote controller with editing functions
- Up to 56hrs battery life

Camcorders

Panasonic NV-GS4B

quicklink > 1Y6DPW



£609
(£715.57)

- 10 x optical zoom
- 500 x digital zoom
- 2.5" LCD Monitor
- 8MB SD Card
- 800k pixel CCD
- Colour nightview

Canon MV550i Digital Camcorder

quicklink > 18HUPW



£599
(£703.82)

- 2.5" LCD
- Night Mode
- Audio Dubbing
- 22X Optical Zoom
- 440X Digital Zoom
- MMC Memory Card

Sony DCR-TRV140 Digital Handycam

quicklink > 17YCPW



£579
(£445.32)

- 1/4" Colour CCD, 460K Pixels
- 20X Optical/560X Digital Zoom
- SteadyShot*
- Super NightShot with Colour Slow Shutter
- i.LINK* DV Interface (IEEE1394)
- 2.5" SwivelScreen™ LCD Display

Gaming

Nintendo Gameboy Advance (Clear Blue)

quicklink > 18UPV



£55
(£64.62)

- 32-bit colour graphics
- Multiplayer action
- L and R Buttons
- New horizontal design

For more information visit www.dabs.com

delivering technology

Look out ahead!

Carrera SSC

OCTAN SPECIAL - Machine of the Year! Special Offer from **£521** +vat

PCPlus
BEST PERFORMER

PCPlus
BEST VALUE

JUNE 2002 "It produced the highest PC Plus index we've seen"

- ◆ Asus Motherboard (voted best motherboard brand) ◆ 256Mb High Performance Memory
- ◆ 40Gb UDMA HDD ◆ 1.44Mb Floppy Drive
- ◆ 17" SVGA Colour Monitor ◆ nVIDIA GeForce 4 64Mb Graphics ◆ 16x DVD-ROM Drive
- ◆ CD ReWriter (Burn Proof Technology)
- ◆ 6 Channel Audio (AMD) & Dolby 5.1 Audio on P4 ◆ Sub Woofer Speakers ◆ 56kbps Voice/Fax Modem ◆ High Speed USB Ports ◆ High Quality Keyboard & Mouse ◆ Windows'98
- ◆ Five Year Warranty - 1st Year On-site, 4yrs RTB Labour ◆ FastTrak (72hr) delivery available
- ◆ On-Line Special Offers www.ssc.co.uk
- ◆ Price UpDate Line: 0700 5622347

OPTIONS/UPGRADES/DELIVERY - SEE PAGE 4

12 Months Interest Free Credit with PPI

*Speakers shown do not come with this system.



AMD® Athlon®		No Monitor	Inc.VAT	17" Monitor	Inc.VAT
Athlon	1800 XP	£521	£612.18	£599	£703.83
Athlon	1900 XP	£534	£627.45	£618	£726.15
Athlon	2000 XP	£569	£668.58	£651	£764.93
Athlon	2100 XP	£599	£703.83	£683	£802.53

Intel® Pentium® 4		No Monitor	Inc.VAT	17" Monitor	Inc.VAT
P4	1.7Ghz	£549	£645.08	£625	£734.38
P4	1.9Ghz	£588	£690.90	£662	£777.85
P4	2Ghz	£599	£703.83	£679	£797.83
P4	2.2Ghz/2.26	£627	£736.73	£719	£844.83

check out the web site for great offers:

- ◆ full listing of over 100 reviews & awards ◆ special offers on-line ◆ referral reward program
- ◆ employee purchase program ◆ factory outlet ◆ cash for schools ◆ ssc university ◆ charity support

WWW.SSC.CO.UK

online configurator & offers Offer ends 30th June 2002



Mobil 1 Rally Championship (rrp £29.99) **FREE** when you visit ssc.co.uk



FALLING PRICE ZONE!

OVER 100 AWARDS

including:
Best PC Manufacturer!
Best Sales Team!

FREE 5x DVD FILMS

with online orders

what a combination

Mission Statement

"Carrera SSC - a partnership built on integrity"...

Carrera SSC join forces working 24x7 to offer high quality performance PC systems at fair prices. We believe that by offering exceptional customer service and support we build a long lasting partnership with you our customer. Maybe this explains why we supply a large percentage of the trade and corporate sector and why we have seen others going by the wayside. Perhaps, it is also why Carrera SSC's customer loyalty is among the highest in the computer mail-order industry. At Carrera SSC, we consider it a privilege to have you as a customer and we understand our continued success depends on people like you. To this end our mission is very simple: to make you one of our many satisfied customers by providing exceptional value coupled with an unmatched level of service and support.

THIS MONTH'S SPECIAL OFFER!

Fantastic Option:

Remote Control
+ Win DVD
+ 2x DVD
Films

£29.95 +vat



CHECK OUT THE WEB SITE FOR GREAT OFFERS:

- ◆ full listing of over 100 reviews & awards
- ◆ special offers on-line
- ◆ referral reward program
- ◆ employee purchase program
- ◆ factory outlet
- ◆ cash for schools
- ◆ ssc university
- ◆ charity support

www.ssc.co.uk

online configurator & offers

0% APR AVAILABLE



Monitor for illustration purpose only

Microsoft
Windows xp
Ready

vision value

from **£263**+vat

- ◆ Intel® Celeron™ / AMD® Duron™ / AMD® Athlon™ Processors
 - ◆ Micro ATX Case
 - ◆ 128Mb High Performance Memory
 - ◆ 40Gb UDMA-100 HDD
 - ◆ 1.44Mb Floppy Drive
 - ◆ 15" SVGA Colour Monitor
 - ◆ All Monitor options available on this model
 - ◆ 52x CD-ROM
 - ◆ Crystal CS4280 sound + high quality speakers
 - ◆ 128-bit 3D AGP Graphics 24bit 230Mhz RAMDAC graphics accelerator with 64Mb (max) frame buffer
 - ◆ 56kbps Voice/Fax Modem with internet software
 - ◆ 2 High Speed USB Ports
 - ◆ High Quality Keyboard & Mouse
 - ◆ Five Year Warranty (1 Year parts & labour + bonus 4yrs labour)
 - ◆ **6 Months Interest Free Credit**
 - ◆ Free Software package with all orders
 - ◆ Free Internet access (local rate call charges)
 - ◆ FastTrak (72hr) delivery available
 - ◆ On-Line Special Offers
 - ◆ www.ssc.co.uk
 - ◆ Price UpDate Line: 0700 5622347
- OPTIONS/UPGRADES/DELIVERY SEE PAGE 4**



0% APR AVAILABLE



Monitor for illustration purpose only

Microsoft
Windows xp
Ready

vision plus

from **£369**+vat

- ◆ Intel® Celeron™ / Pentium® 4 / AMD® Duron™ / Athlon™ Processors
 - ◆ Asus Motherboard (voted best motherboard brand)
 - ◆ ATX Mid Tower Case
 - ◆ 256Mb High Performance Memory
 - ◆ 40Gb UDMA-100 HDD
 - ◆ 1.44Mb Floppy Drive
 - ◆ 17" SVGA Colour Monitor
 - ◆ All Monitor options available
 - ◆ Choice of CD ReWriter or 16x DVD-ROM Drive
 - ◆ nVIDIA GeForce 2mx Graphics
 - ◆ 6 Channel Audio (AMD) & Dolby 5.1 Audio on P4
 - ◆ Sub Woofer Speakers
 - ◆ 56kbps Voice/Fax Modem
 - ◆ 2 High Speed USB Ports
 - ◆ High Quality Keyboard & Mouse
 - ◆ Five Year Warranty - 1st Year On-site, 4yrs RTB Labour
 - ◆ FastTrak (72hr) delivery available
 - ◆ On-Line Special Offers
 - ◆ www.ssc.co.uk
 - ◆ Price UpDate Line: 0700 5622347
- OPTIONS/UPGRADES/DELIVERY SEE PAGE 4**



12 Months Interest Free Credit with PPI

AMD™	No Monitor	inc.VAT	17" Monitor	inc.VAT
Duron 1100	£369	£433.58	£444	£521.70
Athlon 1300	£388	£455.90	£463	£544.03
Athlon 1700 XP	£404	£474.70	£479	£562.83
Athlon 1800 XP	£410	£481.75	£485	£569.88
Athlon 2000 XP	£467	£548.73	£542	£636.85
Athlon 2100 XP	£499	£586.33	£575	£675.63

Intel™	No Monitor	inc.VAT	17" Monitor	inc.VAT
Celeron 1.1Ghz	£374	£439.45	£472	£554.60
Celeron 1.7Ghz	£405	£475.88	£480	£564.00
P4 1.7Ghz	£445	£522.88	£520	£611.00
P4 1.9Ghz	£481	£565.18	£556	£653.30
P4 2.0Ghz	£498	£585.15	£573	£673.28

SPECIAL OFFER!

Colour Printer & Flat Bed Colour Scanner (48Bit 19200 DPI) **ONLY £99** +VAT **£116.33**
Digital Camera Extra £45

WHEN YOU PURCHASE ANY PC FROM THE Carrera SSC RANGE



Carrera SSC
SPECIALIST SALES TEAM

◆ Servers ◆ Audio System
◆ Video Editing System
Call: 0870 066 0601

Over 100 Awards...
Won for Carrera Technology!



All prices exclude V.A.T. unless otherwise stated. Next day delivery is subject to availability. All trademarks & registered trademarks are acknowledged. The Intel® Inside logo, Pentium® and Celeron™ are registered trademarks of Intel® Corporation. Carrera SSC part of Digital Network plc reserve the right to change advertised system price, configuration and cases without prior notice. System photographs are for illustrative purposes only, exact configuration may differ. Carrera SSC terms & conditions apply & are available on request. Despatch charged @ £29+VAT per system. Prices apply from 1st June 2002 onwards. Free Internet access features free unlimited high speed Internet access, unlimited POP3 email accounts and 20Mb Web space. Calls to free Internet service are charged at local rates. Delivery prices quoted are for mainland UK only. All prices are subject to change without notice or obligation. E&OE. Finance available subject to status over 12/24/36 months. Software packages shown are for illustration purposes only, actual packaging may differ from that shown. Software is shipped with on-line documentation only unless otherwise stated. Returned goods may be subject to a restocking charge. Software and third party peripherals (e.g. printers and scanners) are non-refundable. All credit card transactions are free of surcharge. Monitor sizes quoted are manufacturers CRT dimensions, and do not necessarily reflect actual viewable area. Software bundles supplied are OEM versions designed for sale with a new PC. 0% Finance available with Cygnus Pro, Octan Foresight, Octan Ultimate and Focus Extreme.

SALES OFFICE: Carrera SSC, Digital House, The Old Hall, Off Blackwood Road, Two Gates, B77 1JB. Telephone calls charged at the normal rate.

yours from only £263+vat



octan ultimate from **£645+vat**

- ◆ AMD® Athlon™/Intel® Pentium®4 Processors
- ◆ Asus Motherboard (voted best motherboard brand) ◆ ATX Midi Tower Case ◆ 1.44Mb Floppy Drive ◆ 256Mb High Performance Memory
- ◆ 60Gb Ultra DMA HDD 100 with buffer
- ◆ 17" NEC Mitsubishi Ultraflat Monitor
- ◆ All Monitor options available on this model
- ◆ nVidia GeForce 4 - 64Mb Graphics
- ◆ 16x DVD-ROM Drive (40x CD ROM)
- ◆ 32x12x48 with "Burn Proof Technology" CD ReWriter ◆ Software for DVD movie playback
- ◆ Dolby 5.1 Surround Sound (AMD) & Sound Blaster Audigy Dolby Surround (P4)
- ◆ Cambridge Soundworks DT5300 Inspire 5 Point Surround Speakers

5x DVD FILM TITLES FREE with online orders



- ◆ 56kbps Voice/Fax Modem
- ◆ High Speed USB Ports ◆ Carrera High Quality Keyboard/Carrera Wheel Mouse
- ◆ Five Year Warranty - 1st Year On-site, 4yrs RTB Labour
- ◆ FastTrak (72hr) delivery available
- ◆ On-Line Special Offers www.ssc.co.uk
- ◆ Price UpDate Line: 0700 5622347



12 Months Interest Free Credit with PPI

AMD®	No Monitor	inc.VAT	17" Nec Monitor	inc.VAT
Athlon 1800 XP	£584	£686.20	£674	£791.95
Athlon 1900 XP	£608	£714.40	£698	£820.15
Athlon 2000 XP	£641	£753.18	£731	£858.93
Athlon 2100 XP	£672	£789.60	£762	£895.35

Intel®	No Monitor	inc.VAT	17" Nec Monitor	inc.VAT
P4 1.7Ghz	£633	£743.78	£723	£849.53
P4 1.8Ghz	£655	£769.63	£745	£875.38
P4 1.9Ghz	£669	£786.08	£759	£891.83
P4 2Ghz	£686	£806.05	£776	£911.80
P4 2.2Ghz/2.26	£727	£854.23	£817	£959.98
P4 2.4Ghz	£861	£1011.68	£951	£1117.43

focus extreme from **£916+vat**

- ◆ AMD® Athlon™/Intel® Pentium®4 Processors
- ◆ Asus Motherboard (voted best motherboard brand) ◆ ATX Midi Tower Case
- ◆ 256Mb High Performance Memory
- ◆ 80Gb Ultra DMA 100 with buffer HDD
- ◆ 1.44Mb Floppy Drive ◆ 15" TFT Monitor
- ◆ All Monitor options available on this model
- ◆ nVidia GeForce 4 - 128MbTi4400 + DVI Graphics (minus £104 for std card) ◆ 16x DVD-ROM Drive
- ◆ CD-RW (32x12x48) with Burn Proof Technology (DVD Writer + £270) ◆ Sound Blaster Audigy Platinum 5.1 with FireWire Port ◆ Cambridge Soundworks DT5300 Inspire 5 Point Surround Speakers ◆ 56kbps Voice/Fax Modem

5x DVD FILM TITLES FREE with online orders



- ◆ High Speed USB Ports
- ◆ Carrera High Quality Keyboard /Carrera Wheel Mouse
- ◆ Five Year Warranty - 1st Year On-site, 4yrs RTB Labour
- ◆ FastTrak (72hr) delivery available
- ◆ On-Line Special Offers www.ssc.co.uk
- ◆ Price UpDate Line: 0700 5622347



12 Months Interest Free Credit with PPI

AMD®	No Monitor	inc.VAT	15" TFT Monitor	inc.VAT
Athlon 1900 XP	£916	£1076.30	£1146	£1346.55
Athlon 2000 XP	£949	£1115.08	£1179	£1385.33
Athlon 2100 XP	£969	£1138.58	£1199	£1233.83

Intel®	No Monitor	inc.VAT	15" TFT Monitor	inc.VAT
P4 1.9Ghz	£950	£1116.25	£1180	£1386.50
P4 2Ghz	£967	£1136.23	£1197	£1406.48
P4 2.2Ghz/2.26	£999	£1173.83	£1237	£1453.48
P4 2.4Ghz	£1142	£1341.85	£1372	£1612.10
P4 2.5Ghz/2.53	£1343	£1578.03	£1573	£1848.28

Mobil 1 Rally Championship (rrp £29.99) **FREE** when you visit www.ssc.co.uk



space walker from **£436+vat**

- ◆ Intel® Celeron™ / Pentium®III Processors
- ◆ 128Mb High Performance Memory
- ◆ 60Gb Hard Drive
- ◆ 1.44Mb Floppy Drive
- ◆ 15" TFT Monitor
- ◆ All monitor options available on this model
- ◆ 24bit graphics accelerator with 64Mb (max) frame buffer TV out
- ◆ 16x DVD-ROM Drive

5x DVD FILM TITLES FREE with online orders



- ◆ Choice of 56kbps Modem or TV Tuner
- ◆ Firewire, USB & Lan
- ◆ Carrera High Quality Keyboard / Carrera Wheel Mouse
- ◆ High quality Speakers
- ◆ Five Year Warranty - 1st Year On-site, 4yrs RTB Labour
- ◆ FastTrak (72hr) delivery available
- ◆ On-Line Special Offers www.ssc.co.uk
- ◆ Price UpDate Line: 0700 5622347



12 Months Interest Free Credit with PPI

AMD®	No Monitor	inc.VAT	15" TFT Monitor	inc.VAT
Celeron 1Ghz	£436	£512.30	£699	£821.33
Celeron 1.4Ghz	£479	£562.83	£744	£874.20

5 YEAR WARRANTY
1st Year on-site & up to 4yrs RTB Labour



NO CREDIT CARD SURCHARGES

Sales: 0870 066 0682

www.ssc.co.uk

online configurator & offers

Faxline: 0870 066 0683 Sales Lines: 9am-6pm Weekdays & 10am-4pm Saturday

Offer ends 30th June 2002

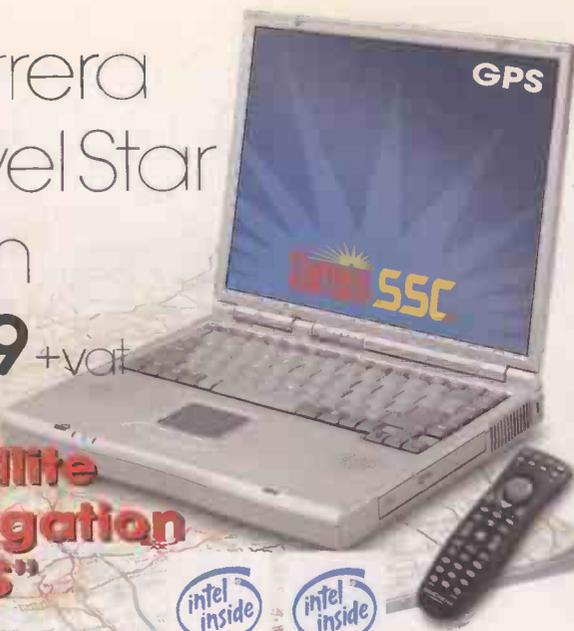
Carrera SSC
what a combination...

Carrera
Travel Star
from

£849 +vat

Including

Satellite
Navigation
"GPS"



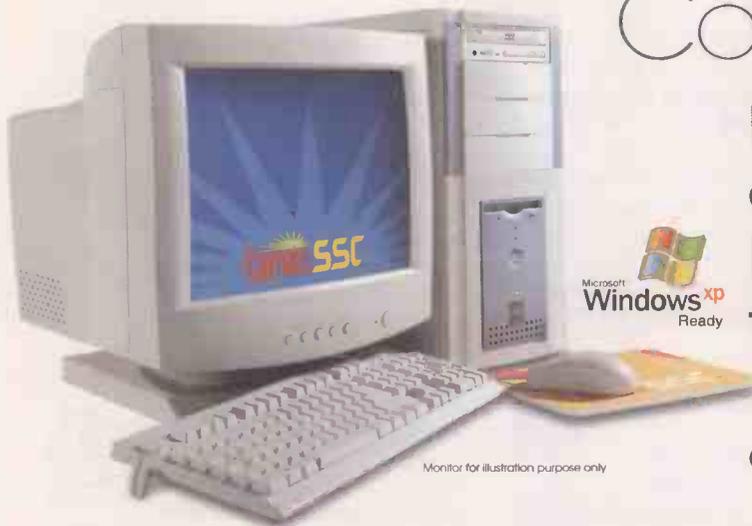
Plan your route with GPS Satellite Navigation



Get on track with our range of
Carrera Travel Star Notebooks

Model	T510-C90-CD	T510-C1-DVD	T510-P1-DVD	T510-P1-CMB
Processor	Cel 900Mhz	Cel 1Ghz	PIII 1Ghz	PIII 1Ghz
Ram	128Mb	128Mb	256Mb	256Mb
Hard Drive	15Gb	20Gb	20Gb	20Gb
Screen Size	13.3" XGA TFT	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT
CD/DVD	CD	DVD	DVD	DVD/CD RW
Sat Nav GPS	Yes	Yes	Yes	Yes
Remote Control	No	Yes	Yes	Yes
Win '98 / ME	Yes	Yes	Yes	Yes
Price	£849 +vat	£948 +vat	£1099 +vat	£1184 +vat

For more models & options call the dedicated sales team



Carrera 2 Business

Power for everyday business tasks -

example spec from **£339 +vat**

- ◆ AMD® Athlon™ 1800 XP
- ◆ Asus Endurance Motherboard
- ◆ Midi Tower Case
- ◆ 256Mb High Performance Memory
- ◆ 40 Gb Hard Drive
- ◆ 52x CD ROM
- ◆ nVIDIA GeForce II Graphics
- ◆ All Monitor Options available on this model
- ◆ 10/100 Network
- ◆ High Speed USB
- ◆ Carrera High Quality Keyboard/Mouse
- ◆ On-site Warranty

Call for details!

Options/Upgrades/Delivery

MONITOR OPTIONS	Price inc VAT	SYSTEM UPGRADES	Price inc VAT
15" Carrera SVGA	£77 £90.48	Storage Upgrades	
17" Carrera SVGA	£89 £104.58	CD ReWriter 24x10x40 burnproof	£59 £69.33
19" Carrera SVGA	£148 £173.90	CD ReWriter 32x12x48 burnproof	£69 £81.08
17" NEC Mitsubishi Ultraflat	£108 £126.90	Upgrade to DVD RAM/R	£245 £287.88
19" NEC Mitsubishi Ultraflat	£175 £205.63	Logitech cordless keyboard & mouse	£49 £57.68
17" Iiyama Visionmaster 1402	£121 £142.18	Memory & Graphics Upgrades	
17" Iiyama Visionmaster 407	£185 £217.38	128Mb > 256Mb	£28 £32.90
19" Iiyama Visionmaster 1451	£156 £183.30	256Mb > 512Mb	£54 £63.45
15" TFT Carrera	£245 £287.88	GeForce 2MX > GeForce 4 64Mb 440	£58 £68.15
15" TFT NEC Mitsubishi	£275 £323.13	GeForce 4 440 > 128Mb TI4400	£118 £138.05
17" TFT Carrera	£389 £457.08	GeForce 4 440 > 128Mb TI4600	£179 £210.15
18" TFT NEC Mitsubishi	£599 £703.83		

Call 0870 066 0682 for full list of upgrades!



Software Option 1	◆ WINDOWS '98 £59 +vat or Windows XP home £69 +vat
Software Option 2	◆ EDUCATION PACK £39 +vat or ◆ GAMES PACK £39 +vat or ◆ BUSINESS PACK £39 +vat
Software Option 3	◆ McAfee ANTI VIRUS £7 +vat
Software Option 4	◆ DELUXE DVD SOFTWARE PLUS 2 DVD FILMS £19 +vat

ON-SITE DELIVERY, INSTALLATION & TRAINING!

DELIVERY OPTION 1	DIRECT FROM FACTORY	£29 +vat
DELIVERY OPTION 2	FastTrak (72hr)	£49 +vat
DELIVERY OPTION 3	DIRECT FROM FACTORY Saturday	£39 +vat
DELIVERY OPTION 4	TECHNICAL ENG. WILL DELIVER & INSTALL, INC. 45 MINUTES ON-SITE, AT A COST OF	£70 +vat

Sales: 0870 066 0682

www.ssc.co.uk

online configurator & offers

Faxline: 0870 066 0683 Sales Lines: 9am-6pm Weekdays & 10am-4pm Saturday

Carrera SSC
what a combination...



Technology Matters



Don't miss a goal
with the Hauppauge USB TV tuner card.
Ideal for your office or home PC & Notebook!



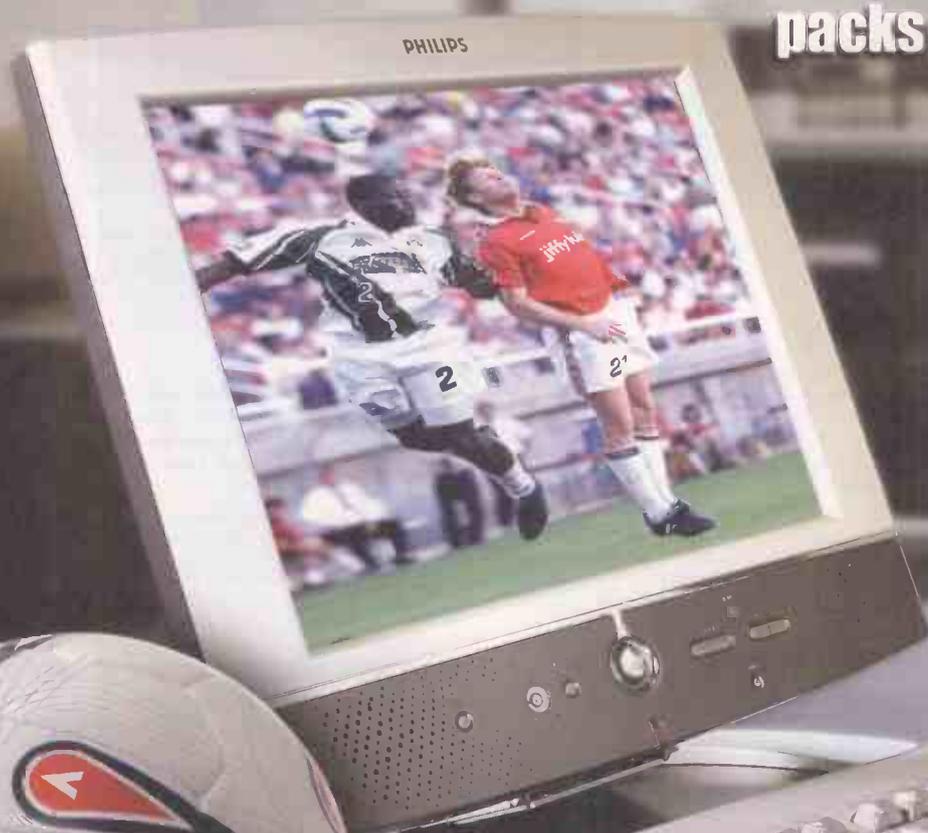
Only **£49.99**



SpaceCube

Now the First console sized PC
packs an affordable punch

from **£399** Ex VAT



**Claim your Mitre ISO England match
quality replica football**

with qualifying PC systems purchased during the World Cup competition.

Introduction



Welcome to the June edition of Green Pages. Whether working from home or an office, the chances are you will not want to miss this year's world cup competition. With this in mind we've negotiated the best deals on TV tuner cards from Hauppauge so you'll get the opportunity to enjoy the action where ever you need to be. We are also giving away thousands of Mitre's popular ISO England match quality replica football with a selection of our PC's (look out for the footballs for qualifying systems).

If you want a great deal on the latest PC technology you should definitely check out our brand new Aries offerings for June which include the Precision 1900 Intel Pentium 4 notebooks incorporating a 15" TFT and DVD or DVD/CDRW Combo drive all from only £1132 Ex VAT & the SpaceCube sporting the brand new Intel Celeron 1.7Ghz processor from only £499 Ex VAT.

We hope you all enjoy the world cup and we hope you'll join us in wishing our teams the best of luck!

I would like to thank you all for your custom and continued enthusiasm in our products and services. During this, our 30th year in business we will continue to bring you special deals and new innovations so make a mental note to visit us again here or online!

Shiraz Jessa
Managing Director
sj@watford.co.uk



6 Easy Ways to Order

Sales: 0870 220 0700

Payment can be made using Visa, MasterCard, Switch or Delta cards. Note: Your Credit/Debit card will not be charged until goods are dispatched.

Fax: 0870 220 0707

(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.

On-Line:

www.watford.co.uk

Experience the convenience and security of electronic commerce. We have invested in advanced technology to enable you to choose from our extensive range of products, customise your own PC or search our technical site for help and advice. Free Standard Delivery UK Deliveries - See Terms above. When your order has been received, you will be contacted by email with a price.

E-mail:

sales@watford.co.uk

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.

Post:

Watford Electronics Ltd.
Jessa House, Finway,
off Dallow Road, Luton.
LU1 1WE

FASTTRACK

Collect your new PC, Notebook or Peripherals direct!

Call 0870 220 0700 to order and pre-pay. Then simply turn up and go straight to the Fast Track desk where your order will be ready and waiting for you. **It will be handed over immediately!**

If you're in the Luton area and just passing by, you're welcome to call in, we'll be happy to serve you at the usual Sales Counter. We accept Visa, MasterCard, Switch and can also provide a cheque clearing service if the amount of purchase is higher than your cheque guarantee limit. **Card holder must present their card when collecting their goods.**

Fast Track Online

You can now place Fast Track orders online with Watford Electronics Log on **www.watford.co.uk** and use our advanced search system to find the products you need. When you wish to checkout, simply click the **"Collect from shop option"** in the basket and continue to place your order as normal. When your order has been picked and is ready for collection you will be sent an e-mail, all you have to do is come and collect your goods.



LUTON Store

Jessa House, Finway, off Dallow Road, Luton. LU1 1WE
Tel: 0870 220 0902 Fax: 0870 220 0903

Terms & Conditions of Sale

- All items, offers, specifications and prices are correct and believed in good faith to be available at the time of going to press, but this may change due to circumstances beyond our control.
- Goods are not sold on a trial basis.
- Goods offered subject to being unsold. In the event of non availability of goods, we reserve the right to rescind the contract.
- We do not warrant the suitability of goods. Please check the suitability of the products with your system and/or the manufacturer before ordering.
- Photographs of products featured may be for illustration and identification purposes only. Minor specification variations do not entitle the purchaser to rescind the contract.
- A full copy of the Terms and Conditions is supplied on the reverse of every Invoice, and is available on request.

Warranty & Returns

- All goods supplied, except software, mice, joysticks, keyboards, consumables and clearance offer items, carry a minimum of 12 months return to base warranty (unless otherwise stated).
 - For certain products a warranty may be available direct with the manufacturer. Any manufacturer/on-site arrangement are to be used by the purchaser.
 - Where items are returned to us for repair under warranty, we do not provide goods on loan.
 - Claims for damage and mis-shipping must be made within 24 hours of receipt.
 - Claims for non-functionality must be made within 7 days of receipt, after this date, and in all circumstances after 28 days, repair and not replacement will be offered.
 - A restocking fee of up to 25% is charged on returns, which prove to be non-defective and we reserve the right to return the goods to you.
 - No opened software will be accepted for refund.
 - It is imperative that items returned for refund are sent in their original packaging.
 - We are not liable for any consequential loss or expenses, however caused (including acts of God), including incidental returns costs.
 - All manufacturer "money back" guarantees are dealt with by the relevant manufacturers and you should contact them to arrange return and refund.
- 0% Finance offer. Finance available subject to status. Written details available upon request. All trademarks are acknowledged. E&OE.

Special Offer Bundles

CD software is subject to availability, and may be in promotional packaging (packaging may refer to boxes, manuals, etc.). In most instances, a digital copy of the manual or on-line support will be included within the software package. Software pack shots are for illustrative purposes only.

Price Effectiveness

ALL PRICES QUOTED IN THIS ADVERT ARE EFFECTIVE FROM 01.06.02 TO 30.06.02. Some specifications may change after 01.06.02.

For latest and most up-to-date prices, please check our web site www.watford.co.uk

Some prices may change due to circumstances beyond our control. Whilst we endeavour to provide pricing which is correct at the time of going to press, please confirm prices at the time of ordering. Prices quoted in the Green Pages refer to mail order sales only. Prices in CompUK stores may vary.

These statements do not affect and are in addition to the customers statutory rights. Except where stated otherwise, all prices exclude VAT and Carriage. E&OE. All pictures, unless otherwise stated, are for illustrative purposes only.

Official Orders:

Orders received from the Public Sector, Educational Establishments and approved companies are welcomed. To open an account please call our Major Accounts Team on 0870 220 0706. Official Purchase orders can be faxed on 0870 220 0707.

Price Promise

If you find the identical product cheaper elsewhere we will beat the advertised total price (including delivery) subject to not selling below our cost price. This refers to UK products available ex-stock that are shipped within 3 days. We reserve the right not to beat prices on liquidated, end of line or OEM items, and will not match prices that have been printed incorrectly or prices that the advertiser cannot supply owing to lack of stock. Please note that the price pledge is only available at the time of ordering and is applicable to mail order purchases only. Excludes all corporate customers with special pricing agreements.

Mystery Prize

Free with every customer invoking our unique price pledge, while stocks last.

Low Price Finance

Typical Example: Cash Price £1000. 10% deposit. Total Loan £900. Payable by 36 monthly payments of £32.67. Total Amount Payable £1276.12 APR 19.9%. Written details on request. All credit subject to status.

Delivery Charges

for the UK and Southern Ireland
Web Ordering

FREE on all orders within mainland UK*.

Small Order charge of £2.95+ on orders less than £75+VAT. £4.95+VAT converts 2-4 day delivery in to a next working day delivery. *Check website for exclusions

Mail Order

PC's + Notebooks	£19.95 +VAT
Consumables & Cables	£2 +VAT
All other Orders	£9.95 +VAT
Orders under £80.00	£4.95 +VAT.

Channel Islands, Northern Ireland, Scottish Highlands & Islands

All orders delivered to the Channel Islands, Northern Ireland and the Scottish Highlands & Islands will be charged carriage at a flat rate of £20+VAT. Please allow 2 to 4 working days from date of despatch for delivery of your order.

A next working day service is not available for delivery to these areas.

Eire

All orders delivered to Eire will be charged carriage at a flat rate of £25+VAT up to 20Kg. Small items will be charged at £4.95. Please allow 2 to 4 working days from date of despatch for delivery of your order. A next working day service is not available for delivery to Eire.

Overseas Delivery

We regret that currently we are not able to accept orders from outside the UK and Ireland as our insurance policy does not cover goods for export.

General Sales 0870 220 0700
FAX: 0870 220 0707 sales@watford.co.uk

Major Accounts 0870 220 0706
FAX: 0870 220 0707 major.accounts@watford.co.uk

Customer Services 0870 220 0704
FAX: 0870 220 0705 customers.services@watford.co.uk

Technical Support 0870 220 0847
FAX: 0870 220 0846 technical.support@watford.co.uk

Aries PC Support 0870 220 0848
FAX: 0870 220 0846 ariespc@watford.co.uk

Credit Control 0870 220 0708
FAX: 0870 220 0709 accounts@watford.co.uk

Switchboard 0870 220 0044
FAX: 0870 220 0045

Aries Precision 1300



Specification

14.1" TFT XGA Display
 Upto **32Mb Shared Graphics Video**
64 bit 2D & 3D GUI Engine
CD ROM Drive
 16 bit Business Audio Sound
 56Kbps V90 Modem with **FREE Internet Access**
 10/100 Ethernet LAN Adapter
1 x IEEE1394 Firewire Port
 Li-ion Battery
 Dual integrated stereo speakers
 Internet Hot Key
 2 x USB, Parallel, Fast Infra-Red
 TV Out and external CRT monitor connector
 PS/2 Keyboard/Mouse
 PCMCIA Type II Card Slot
 ACPI Power Management
 12 months collect & return Warranty upgradeable to 3 years

Intel® Celeron 1.0GHz

10 GB Hard Disk Drive
 128MB RAM
 Upgradable to 512MB
 PartCode 28440
£699.00 Ex VAT **£821.32** Inc VAT

Sony

GRX415MP Notebook

PartCode 28745
 Mobile Intel® 1.6 GHz Pentium® 4 processor. 15" TFT XGA screen. ATI Mobility Radeon 7500 16Mb. Removable CDRW/DVD ROM. 30 GB hard disk drive and 256Mb RAM V90 56K Modem, i-Link Port, Magic Gate Memory Slot, Built in RJ-45 10/100 Base TX. TV Out
£1534 Ex VAT **£1802.45** Inc VAT

FX701 Notebook

PartCode 28746
 Mobile AMD Athlon™ 1400XP Processor, 20 GB hard disk drive and 256 MB SDRAM. ATI-3D Rage -Mobility M1 with 8MB SDRAM. 14.1" TFT XGA colour display. 8xDVD drive. i-Link Port. V90 56K Flex Modem. Built in RJ-45 10/100 Base TX. TV Out & custom suite of Sony software, including Adobe Photoshop Elements.
£1019 Ex VAT **£1197.33** Inc VAT

Aries Precision 1700



Specification

14.1" TFT XGA Display
ATI M6D 16Mb Graphics Video
64 bit 2D & 3D GUI Engine
DVD ROM or Combo Drive
 16 bit Business Audio Soundblaster Sound
 56Kbps V90 Modem with **FREE Internet Access**
 10/100 Ethernet LAN Adapter
1 x IEEE1394 Firewire Port
 Li-ion Battery
 Dual integrated stereo speakers
 Internet Hot Key
 2 x USB, Parallel, Fast Infra-Red
 S-Video Out and external CRT monitor connector
 PS/2 Keyboard/Mouse
 PCMCIA Type II Card Slot
 ACPI Power Management
 1 Years collect & return Warranty upgradeable to 3 years

Intel® P4 1.7GHz

20 GB Hard Disk Drive
 256MB RAM, DVD Rom
 Upgradable to 1Gb
 PartCode 28496
£939 Ex VAT **£1103.32** Inc VAT

Intel® P4 2.0GHz

40 GB Hard Disk Drive
 256MB RAM, Combo Drive
 Upgradable to 1Gb
 PartCode 28497
£1099 Ex VAT **£1291.33** Inc VAT



Sony

GRX316MP Notebook

PartCode 28530
 Mobile Intel® 1.6 GHz Pentium® 4 processor Supports Enhanced Intel® SpeedStep™ technology.
 16.1" TFT UXGA screen. ATI Mobility Radeon 7500 16Mb. Removable CDRW/DVD ROM. 30 GB hard disk drive and 256Mb RAM
£1580 Ex VAT **£1856.50** Inc VAT

Aries Precision 1800



Specification

14.1" TFT XGA Display
S3 Twister Graphics Video
64 bit 2D & 3D GUI Engine
DVD ROM Drive
 16 bit Business Audio Soundblaster Sound
 56Kbps V90 Modem with **FREE Internet Access**
 10/100 Ethernet LAN Adapter
1 x IEEE1394 Firewire Port
 Li-ion Battery
 Dual integrated stereo speakers & Microphone
 2 x USB, Parallel, Fast Infra-Red
 S-Video Out and external CRT monitor connector
 PS/2 Keyboard/Mouse
 PCMCIA Type II Card Slot
 ACPI Power Management
 1 Years collect & return Warranty upgradeable to 3 years

AMD® K7 1.2GHz

30 GB Hard Disk Drive
 256MB RAM
 Upgradable to 384Mb RAM
 PartCode 28494
£859 Ex VAT **£1009.32** Inc VAT

TrafficMaster PartCode 12499

FREEWAY

Compact speech-based live traffic information module.



Advance warning of delays up to 2 junctions or 12 miles ahead of vehicle.

Functional on all motorways and trunk roads on the Trafficmaster network. Battery-powered, fully portable.

Usual price £79.99 including 12 months information service.

Information service renewal fee, £30.00 for 12 months.

£35 Ex VAT **£41.13** Inc VAT

Editors Choice



Aries Precision 1900

Specification

15" TFT XGA Display
ATI M6D 16Mb Graphics Video
64 bit 2D & 3D GUI Engine
DVD ROM Drive
 16 bit Business Audio Soundblaster Sound
 56Kbps V90 Modem with **FREE Internet Access**
 10/100 Ethernet LAN Adapter
1 x IEEE1394 Firewire Port
 Li-ion Battery
 Dual integrated stereo speakers
 Internet Hot Key
 2 x USB, Parallel, Fast Infra-Red
 S-Video Out and external CRT monitor connector
 PS/2 Keyboard/Mouse
 PCMCIA Type II Card Slot
 ACPI Power Management
 1 Years collect & return Warranty upgradeable to 3 years

Intel® P4 1.7GHz

20 GB Hard Disk Drive
 256MB RAM, DVD Rom
 Upgradable to 1Gb
 PartCode 28727
£1132 Ex VAT **£1330.10** Inc VAT

Intel® P4 2.0GHz

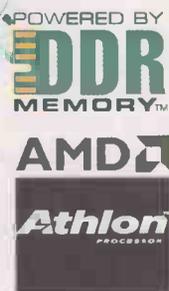
30 GB Hard Disk Drive
 256MB RAM, Combo Drive
 Upgradable to 1Gb
 PartCode 28728
£1299 Ex VAT **£1526.32** Inc VAT

Additions & Upgrades

	Ex VAT	Inc VAT
Additional RAM		
27773 128MB	£25.00	£29.37
27774 256MB	£50.00	£57.56
DVD to CDRW/DVD Combo		
27603 CDRW/DVD	£110.60	£129.95
Power		
27775 Lithium ION Battery	£68.04	£79.95
27776 In Car Adaptor	£42.51	£49.95
Cases		
28521 Nylon	£16.98	£19.95
26491 Leather	£110.60	£129.95
Microsoft Operating Systems are Pre-installed.		
27715 Windows® Xp Home	£59.53	£69.95
27717 Windows® Xp Pro	£136.13	£159.95
25569 Windows® Me	£59.53	£69.95
27482 Windows® 2000	£136.13	£159.95



XP1700
from **£299**



Additions

	Ex VAT	Inc VAT
Aries Monitors		
10075 15" EnergyPro	£79.00	£92.82
21934 17" EnergyPro	£87.00	£102.23
22178 19" EnergyPro	£132.00	£155.10
24895 15.2" TFT LCD	£249.00	£292.57
26118 17" TFT LCD	£379.00	£445.33
28127 17" TFT LCD, Speakers	£410	£481.75
Keyboards		
19969 Aries EasySpace 105 Key	£5.06	£5.95
29112 Aries SoftTouch Internet	£9.99	£11.63
29113 Aries Multimedia 105 Key	£15.00	£17.63
22946 Microsoft Ergonomic	£29.00	£38.08
22823 Logitech Cordless	£49.00	£57.58
21075 Logitech Access	£12.99	£15.26
22945 Microsoft Internet	£15.00	£17.62
Mice		
19826 Aries PS2	£2.51	£2.95
24025 Aries Wheel PS2	£5.99	£7.03
26616 Logitech Cordless Optical	£33.00	£38.78
20002 MS Wheel Mouse	£6.00	£7.63
23004 MS Intellimouse	£32.00	£37.50
Graphics		
Geforce 2 MX400 Upgrade to		
28605 Geforce 4 MX440	£29.00	£34.07
28756 Geforce 4 Ti4200	£99.00	£116.33

Upgrades

	Ex VAT	Inc VAT
SD RAM		
23851 128MB	£25.00	£29.38
24195 256MB	£47.00	£55.23
26245 512MB	£79.00	£92.83
DDR RAM		
26383 128MB	£26.00	£30.55
26384 256MB	£47.00	£55.23
27801 512MB	£115.00	£135.13
DVD/CD-RW ROM		
27816 16x DVD ROM	£20.00	£23.50
28713 32x10x40 CDRW	£48.00	£56.40
28008 DVD/CDRW Combo	£89.00	£104.58
28162 DVD+RW (Re-Writer)	£299	£351.32
27615 DVD-RAM/DVD-R	£295	£346.63
Speakers Aries		
10699 Aries 100 Watt	£10.00	£11.75
23566 Aries 150 Watt	£15.00	£19.99
Speakers Creative/Philips		
27582 4 Point Surround	£42.00	£49.35
27583 Inspire 5.1 5300	£75.00	£88.13
25649 Philips A1.2 Fun	£11.00	£12.93
25653 Philips A2.3	£28.00	£32.90
28428 Philips A2.6	£49.00	£57.58
Operating System Microsoft		
27715 Xp Home*	£59.53	£69.95
27717 Xp Professional*	£136.13	£159.95
27482 2000*	£136.13	£159.95
25569 Me*	£59.53	£69.95

*Pre-loaded for your convenience

LEASING From **£29.00** to **£35.00** per month
Monthly Re-Payments over 3 years (subject to status).

INTEREST FREE CREDIT
12 months interest free credit options available.

CALL FOR DETAILS **08702200700**

Aries Performance 200

Specification

- MD Duron™ Processor
- MSi 6378 Motherboard V2
- 128MB** PCI33 RAM Memory
- 8MB** 3D Shared Graphics
- AC 97 Onboard Sound
- 52x** CD ROM
- Internal 56k V.92 Fax/Modem
- Mini Tower Case
- Floppy Drive
- 1 Year's On-site Warranty

AMD® Duron 1GHz
40 GB Hard Disk Drive
PartCode 28687
£239.00 Ex VAT **£280.82** Inc VAT

60 GB Hard Disk Drive
PartCode 28636
£255.00 Ex VAT **£299.63** Inc VAT

AMD® Duron 1.2GHz
40 GB Hard Disk Drive
PartCode 28688
£249.00 Ex VAT **£292.58** Inc VAT

60 GB Hard Disk Drive
PartCode 28637
£269.00 Ex VAT **£316.08** Inc VAT

AMD® Athlon 1.4GHz
40 GB Hard Disk Drive
PartCode 28689
£279.00 Ex VAT **£327.83** Inc VAT

60 GB Hard Disk Drive
PartCode 28638
£315.00 Ex VAT **£351.33** Inc VAT



Aries
PartCode 27003
15" TFT Monitor
£229 Ex VAT **£269.08** Inc VAT

Aries Performa Xp

Specification

- AMD Athlon™ Processor
- MSi 6378 Motherboard V2
- 256MB** PCI33 RAM Memory
- 8MB** 3D Shared Graphics
- AC 97 Onboard Sound
- 52x** CD ROM
- Internal 56k V.92 Fax/Modem
- Mini Tower Case
- Floppy Drive
- 1 Year's On-site Warranty

AMD® Athlon Xp 1700
40 GB Hard Disk Drive
PartCode 28691
£299.00 Ex VAT **£351.33** Inc VAT

60 GB Hard Disk Drive
PartCode 28639
£319.00 Ex VAT **£374.83** Inc VAT

AMD® Athlon Xp 1800
40 GB Hard Disk Drive
PartCode 28692
£319.00 Ex VAT **£374.83** Inc VAT

60 GB Hard Disk Drive
PartCode 28640
£339.00 Ex VAT **£398.33** Inc VAT

AMD® Athlon Xp 1900
40 GB Hard Disk Drive
PartCode 27955
£339.00 Ex VAT **£398.33** Inc VAT

60 GB Hard Disk Drive
PartCode 28641
£359.00 Ex VAT **£421.83** Inc VAT

AMD® Athlon Xp 2000
40 GB Hard Disk Drive
PartCode 28676
£369.00 Ex VAT **£433.58** Inc VAT

60 GB Hard Disk Drive
PartCode 28642
£389.00 Ex VAT **£457.08** Inc VAT

Sitecom PartCode 28534

USB-Fast IrDa Adapter

Any modern mobile telephones and PDA's (handheld computers) are equipped with an Infrared (IrDa) port for communicating with a PC or peripheral equipment.

This makes it possible to store information as backup or synchronise a PC diary and address databases. You can even link two computers together to send files.

USB V1.1 & IrDa V1.1. Standard. Supports Infrared & Fast Infrared applications with data transfer at 115Kbps to 4Mbps. DMA data transfer for stable & reliable data transfer. Suitable for Windows 98/ME/2000/Xp. Includes manual

£59 Ex VAT **£69.32** Inc VAT



Aries PerformaXp DDR2

Specification

AMD Athlon™ Processor
MSi 6380 Motherboard
128MB PC2100 DDR RAM
64MB GeForce 2 **MX400** Graphics
AC 97 Onboard Sound
40GB or **60GB** Hard Drive
16x DVD ROM (40xCD ROM)
Internal 56k V.92 Fax/Modem
Mini Tower Case
Floppy Drive
1 Year's On-site Warranty

Aries PerformaXp 4

Specification

AMD Athlon XP™ Processor
MSi 6380E KT333 Motherboard
256MB PC2100 DDR RAM
64MB GeForce 4 **MX420** Graphics with TV Out
6 Channel Sound System
40GB or **80GB** Hard Drive
16x DVD ROM (40xCD ROM)
32x10x40 CD Writer
Internal 56k V.92 Fax/Modem
Mini Tower Case
Floppy Drive
1 Year's On-site Warranty

Award Winning Review

Aries Performa 8500 DDR

'ATI's Radeon 8500LE card sets this system way above the pack... It also has the added bonus of DVI and S-Video outputs... The Epson Stylus C60 is one of the best printers here and, paired with the Perfection 1250 scanner; also from Epson, this system includes one of the most solid peripherals package.
Personal Computer World May 2002

Specification

AMD Athlon XP 1600
CTX 17" SVGA Monitor
MSI 6380 Motherboard v2
256MB PC2100 DDR RAM
40GB Hard Drive (7200rpm)
64MB Radeon DDR AGP
SoundBlaster LivePlayer 5.1
Mini Tower ATX Case
3.5" 1.44MB FDD
12x DVD ROM
16x10x40 CDRW Drive
Aries 56k Winsoft Modem
Creative Inspire 5.1 Surround Speakers
Logitech Keyboard, Optical PS2 Mouse



Epson Stylus C60 Colour Printer
Epson perfection 1250U USB Scanner
Philips Toucam Fun USB Camera
Five FREE DVD Movies
1 Year On-site Warranty

£999 Ex VAT **£1173.83** Inc VAT

AMD® Athlon Xp 1700

40 GB Hard Disk Drive
PartCode 28643
£379.00 Ex VAT **£445.33** Inc VAT

AMD® Athlon Xp 1700

40 GB Hard Disk Drive
PartCode 28693
£479.00 Ex VAT **£562.83** Inc VAT

60 GB Hard Disk Drive
PartCode 28644
£399.00 Ex VAT **£468.83** Inc VAT

80 GB Hard Disk Drive
PartCode 28411
£519.00 Ex VAT **£609.83** Inc VAT

AMD® Athlon Xp 1800
40 GB Hard Disk Drive
PartCode 28645
£399.00 Ex VAT **£468.83** Inc VAT

AMD® Athlon Xp 1800
40 GB Hard Disk Drive
PartCode 28694
£449.00 Ex VAT **£586.33** Inc VAT

60 GB Hard Disk Drive
PartCode 28646
£419.00 Ex VAT **£492.33** Inc VAT

80 GB Hard Disk Drive
PartCode 28695
£539.00 Ex VAT **£633.33** Inc VAT

AMD® Athlon Xp 1900
40 GB Hard Disk Drive
PartCode 28647
£419.00 Ex VAT **£492.33** Inc VAT

AMD® Athlon Xp 1900
40 GB Hard Disk Drive
PartCode 28414
£519.00 Ex VAT **£609.83** Inc VAT

60 GB Hard Disk Drive
PartCode 28648
£439.00 Ex VAT **£515.83** Inc VAT

80 GB Hard Disk Drive
PartCode 28415
£559.00 Ex VAT **£656.83** Inc VAT

AMD® Athlon Xp 2000
40 GB Hard Disk Drive
PartCode 28649
£449.00 Ex VAT **£527.58** Inc VAT

AMD® Athlon Xp 2000
40 GB Hard Disk Drive
PartCode 28416
£549.00 Ex VAT **£645.08** Inc VAT

60 GB Hard Disk Drive
PartCode 28650
£469.00 Ex VAT **£551.08** Inc VAT

80 GB Hard Disk Drive
PartCode 28417
£589.00 Ex VAT **£692.08** Inc VAT

Review Machine

Aries Performance DDR

'We were gob-smacked to get a 17in CTX Monitor with a PC at this price.

Likewise the Logitech keyboard is just far superior to the kind of peripheral we're used to seeing with machines at this price. Throw in an optical wheelmouse and you've got your perfect score'.

'what is there is of a much higher quality than you'd normally expect in a £499 PC. You wouldn't normally get a 17in monitor of this quality with a PC unless it was a hundred quid more expensive than this'.



Computer Buyer April 2002

Specification

AMD Duron 1.GHz
MSI 6380 Motherboard
128MB DDR PC2100 RAM
20GB Hard Drive (7200rpm)
AGP GeForce 2 MX400 Graphics Card
AC97 Onboard Sound
Creative CSW320 Speakers
Mini Tower ATX Case
3.5" 1.44MB FDD

12x DVD ROM
Aries 56k V92 Modem
CTXVL700 17" SVGA Monitor
Logitech Delux Access Keyboard
Optical PS2 Mouse
MS Works V6 Software
MS Windows ME*
1 Year's On-site Warranty

£499 Ex VAT **£586.33** Inc VAT

Z Bluetooth USB Key

Desktop PC's, Notebooks, Printers and similar USB devices can easily become Bluetooth enabled by plugging the bluetooth usb key directly into a USB-port or through a USB cable provided with the product. In addition, a full Bluetooth protocol stack with user-interface is included with the product. Once Bluetooth enabled, Notebooks and PCs can wirelessly communicate with each other or with Bluetooth enabled devices to wirelessly share and

exchange data and access network resources and the Internet, eliminating cables and entanglements associated with cables.

Ideal for multiuser gaming too!!
28765 20 Meter Range **£39.99** £46.98
28766 50 Meter Range **£49.99** £58.73





1.9GHz
from **£399**



Additions

	Ex VAT	Inc VAT
Aries Monitors		
10075 15" EnergyPro	£79.00	£92.82
21934 17" EnergyPro	£87.00	£102.23
22178 19" EnergyPro	£132.00	£155.10
24895 15.2" TFT LCD	£249.00	£292.57
26118 17" TFT LCD	£379.00	£445.33
28127 17" TFT LCD, Speakers	£410	£481.75
Keyboards		
19969 Aries EasySpace 105 Key	£5.06	£5.95
29112 Aries SoftTouch Internet	£9.99	£11.63
29113 Aries Multimedia 105 Key	£15.00	£17.63
22946 Microsoft Ergonomic	£29.00	£38.08
22823 Logitech Cordless	£49.00	£57.58
21075 Logitech Access	£12.99	£15.26
22945 Microsoft Internet	£15.00	£17.62
Mice		
19826 Aries PS2	£2.51	£2.95
24025 Aries Wheel PS2	£5.99	£7.03
26616 Logitech Cordless Optical	£33.00	£38.78
20002 MS Wheel Mouse	£6.00	£7.63
23004 MS Intellimouse	£32.00	£37.50
Graphics		
Geforce 2 MX400 Upgrade to		
28605 Geforce 4 MX440	£29.00	£34.07
28756 Geforce 4 Ti4200	£99.00	£116.33

Upgrades

	Ex VAT	Inc VAT
SD RAM		
23851 128MB	£25.00	£29.38
24195 256MB	£47.00	£55.23
26245 512MB	£79.00	£92.83
DDR RAM		
26383 128MB	£26.00	£30.55
26384 256MB	£47.00	£55.23
27801 512MB	£115.00	£135.13
DVD/CD-RW ROM		
27816 16x DVD ROM	£20.00	£23.50
28713 32x10x40 CDRW	£48.00	£56.40
28008 DVD/CDRW Combo	£89.00	£104.58
28162 DVD+RW (Re-Writer)	£299	£351.32
27615 DVD-RAM/DVD-R	£295	£346.63
Speakers Aries		
10699 Aries 100 Watt	£10.00	£11.75
23566 Aries 150 Watt	£15.00	£19.99
Speakers Creative/Philips		
27582 4 Point Surround	£42.00	£49.35
27583 Inspire 5.1 5300	£75.00	£88.13
25649 Philips A1.2 Fun	£11.00	£12.93
25653 Philips A2.3	£28.00	£32.90
28428 Philips A2.6	£49.00	£57.58
Operating System Microsoft		
27715 Xp Home*	£59.53	£69.95
27717 Xp Professional*	£136.13	£159.95
27482 2000*	£136.13	£159.95
25569 Me*	£59.53	£69.95

*Pre-loaded for your convenience

Aries Perfecta 800

Specification

Intel® Celeron™ Processor
MSi 6368 Motherboard Rev5
128MB PCI33 RAM Memory
8MB Shared Graphics
AC 97 Onboard Sound
52x CD ROM
Internal 56k V.92 Modem & 10/100 Network
Mini Tower Case
Floppy Drive
1 Year's On-site Warranty

Intel® Celeron 1GHz

40 GB Hard Disk Drive
PartCode 28690
£249.00 Ex VAT **£292.58** Inc VAT

60 GB Hard Disk Drive
PartCode 28651
£269.00 Ex VAT **£316.08** Inc VAT

Intel® Celeron 1.2GHz

40 GB Hard Disk Drive
PartCode 27983
£269.00 Ex VAT **£316.08** Inc VAT

60 GB Hard Disk Drive
PartCode 28652
£289.00 Ex VAT **£339.58** Inc VAT



Aries PartCode 27003

15" TFT Screen
This 15" TFT combines the traditional Aries design, with it's easy to use shuttle OSD. Packed into a minimised housing, bringing you the most modern technical features.
£229 Ex VAT **£269.08** Inc VAT

Aries Perfecta 4160

Specification

Intel® Pentium® 4 Processor
MSi 6524GL Motherboard
256MB PCI33 RAM Memory
16MB Shared Graphics
AC 97 Onboard Sound
52x CD ROM
Internal 56k V.92 Modem
Midi Tower Case
Floppy Drive
10/100 Network Adaptor
1 Year's On-site Warranty

Intel® P4 1.6GHz
40 GB Hard Disk Drive
PartCode 28591
£349.00 Ex VAT **£410.08** Inc VAT

60 GB Hard Disk Drive
PartCode 28592
£369.00 Ex VAT **£433.58** Inc VAT

Intel® P4 1.7GHz
40 GB Hard Disk Drive
PartCode 28593
£379.00 Ex VAT **£445.33** Inc VAT

60 GB Hard Disk Drive
PartCode 28594
£399.00 Ex VAT **£468.83** Inc VAT

Intel® P4 1.9GHz
40 GB Hard Disk Drive
PartCode 28595
£399.00 Ex VAT **£468.83** Inc VAT

60 GB Hard Disk Drive
PartCode 28596
£419.00 Ex VAT **£492.33** Inc VAT

Intel® P4 2GHz
40 GB Hard Disk Drive
PartCode 28597
£429.00 Ex VAT **£504.08** Inc VAT

60 GB Hard Disk Drive
PartCode 28598
£449.00 Ex VAT **£527.58** Inc VAT

Special Offer

Printer & Scanner Bundle Option

When you purchase any PC from Watford Electronics Aries Range

Epson C20SX Colour Printer
720 x 720dpi resolution for High Quality Black and Colour Printing.
4 colour printing for a wide range of printing applications. Print speeds of up to 6.5ppm black text and 3.5ppm colour. EPSON 6pl Ultra Micro Dot with Variable Sized Droplet Technology.

Hewlett Packard 2200C Colour Scanner
600 dpi optical, 600 x 1200 dpi hardware, 9600 dpi enhanced resolution. One-pass colour and monochrome. 42-bit colour. USB interface.
£94.00 Ex VAT **£110.45** Inc VAT

LEASING From **£29.00** to **£35.00** per month
Monthly Re-Payments over 3 years (subject to status).

INTEREST FREE CREDIT
12 months interest free credit options available.

CALL FOR DETAILS **08702200700**

Aries Perfecta 4260

Specification

Intel® Pentium® 4 Processor
MSi 6524GL Motherboard
256MB SDRAM Memory
64MB GeForce 2 MX400 Graphics
AC 97 Onboard Sound
16x DVD ROM (40xCD)
Internal 56k V.92 Modem
Midi Tower Case
Floppy Drive
10/100 Network Adaptor
1 Year's On-site Warranty

Intel® P4 1.7GHz

40 GB Hard Disk Drive
PartCode 28255
£439.00 Ex.VAT **£515.83** Inc.VAT

60 GB Hard Disk Drive
PartCode 28256
£459.00 Ex.VAT **£539.33** Inc.VAT

Intel® P4 1.9GHz

40 GB Hard Disk Drive
PartCode 28257
£459.00 Ex.VAT **£539.33** Inc.VAT

60 GB Hard Disk Drive
PartCode 28258
£479.00 Ex.VAT **£562.83** Inc.VAT

Intel® P4 2GHz

40 GB Hard Disk Drive
PartCode 28259
£489.00 Ex.VAT **£574.58** Inc.VAT

60 GB Hard Disk Drive
PartCode 28260
£509.00 Ex.VAT **£598.08** Inc.VAT

Intel® P4 2.4GHz

40 GB Hard Disk Drive
PartCode 29111
£639.00 Ex.VAT **£750.83** Inc.VAT

60 GB Hard Disk Drive
PartCode 29112
£659.00 Ex.VAT **£774.33** Inc.VAT

Aries Perfecta 4460 DDR

Specification

Intel® Pentium® 4 Processor
MSi 6533GL Motherboard
256MB PC2100 DDR RAM Memory
64MB GeForce 4 MX440 Graphics
AC 97 Onboard Sound
40GB or 80GB Hard Drive
16x DVD ROM (40xCD ROM)
30x10x40 **CD Writer**
Internal 56k V.92 Modem
Mini Tower Case
Floppy Drive
1 Year's On-site Warranty

Intel® P4 1.7GHz

40 GB Hard Disk Drive
PartCode 28264
£499.00 Ex.VAT **£586.33** Inc.VAT

80 GB Hard Disk Drive
PartCode 28265
£549.00 Ex.VAT **£645.08** Inc.VAT

Intel® P4 1.9GHz

40 GB Hard Disk Drive
PartCode 28266
£529.00 Ex.VAT **£621.58** Inc.VAT

80 GB Hard Disk Drive
PartCode 28267
£569.00 Ex.VAT **£668.58** Inc.VAT

Intel® P4 2GHz

40 GB Hard Disk Drive
PartCode 28268
£559.00 Ex.VAT **£656.83** Inc.VAT

80 GB Hard Disk Drive
PartCode 28269
£599.00 Ex.VAT **£703.83** Inc.VAT

Intel® P4 2.4GHz

40 GB Hard Disk Drive
PartCode 29113
£709.00 Ex.VAT **£833.08** Inc.VAT

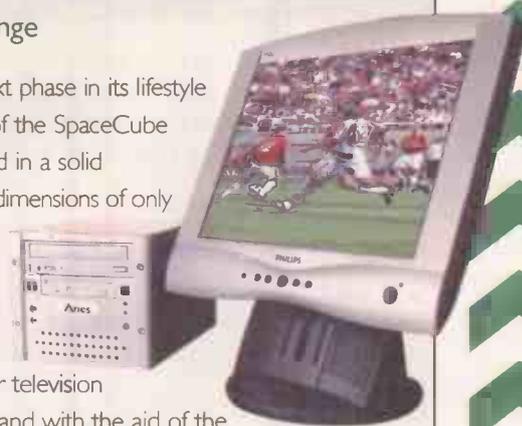
80 GB Hard Disk Drive
PartCode 29114
£749.00 Ex.VAT **£880.08** Inc.VAT

Introducing Aries LifeStyle Computers

Aries LifeStyle Range

Aries introduce the next phase in its lifestyle PC range in the guise of the SpaceCube series of PC's. Presented in a solid aluminium chassis with dimensions of only 28cm x 20cm x 18cm this console sized computer packs a

powerful punch. It will connect directly to your television to replay DVD movies and with the aid of the optional wireless keyboard & mouse you can surf the web from the comfort of your armchair. Connect and edit your digital camera or camcorder footage through the multiple front and rear USB & Firewire IEEE1394 ports or just kick back and play the latest game – it's your choice.



Aries SpaceCube 1200

Specification

Intel Celeron Tualatin Ready
FV25 Motherboard
4x USB Ports
2x Rear IEEE 1394 Firewire Ports
128Mb PC133 Ram Memory
40Gb Hard Drive
16x DVD Drive
AC97 Onboard Sound
On-Board 2D/3D Graphics
TV Out
Internal 56K v.92 Modem
Realtek 10/100mbps Network Onboard
3.5" Floppy
1 Year's On-site Warranty

Aries SpaceCube 2200

Specification

Intel Socket 478 Ready
FS50 Motherboard
256Mb DDRPC2100 Memory
60Gb Hard Drive
16x DVD Drive
Surround Sound 6 Channel Sound System
On-Board 3D Graphics
TV Out
Internal 56K v.92 Modem
10/100 Network
3.5" Floppy
1 Year's On-site Warranty

Intel® Celeron 1.7GHz

PartCode 29185
£499.00 Ex.VAT **£586.32** Inc.VAT

Intel® P4 1.7GHz

PartCode 28679
£569.00 Ex.VAT **£668.58** Inc.VAT

Intel® P4 2.0GHz

PartCode 28680
£599.00 Ex.VAT **£703.83** Inc.VAT

Intel® Celeron 1.GHz

PartCode 28678
£399.00 Ex.VAT **£468.83** Inc.VAT

SpaceCube Upgrade Option

	Ex.VAT	Inc.VAT		Ex.VAT	Inc.VAT		
Monitors			Memory				
21934	17" Aries	£87.00	£102.23	24195	256Mb SDRAM	£47.00	£55.33
25714	15.2" TFT LCD	£269.00	£316.08	26245	512Mb SDRAM	£79.00	£92.83
25555	Philips 150X 15" TFT + Wireless Keyboard & Mouse	£479.00	£562.82	26384	256Mb DDR	£47.00	£55.23
				27801	512Mb DDR	£115.00	£135.12
Keyboards & Mice			Speakers				
22823	Logitech I-Touch Wireless Keyboard & Mouse	£49.00	£57.57	28527	Philips A3.6 1200watt Flat Panel + Sub/Woofer	£99.00	£166.32
DVD/CDRW			Operating System				
28713	CDRW 32x10x40x	£48.00	£56.40	27715	Xp Home	£59.53	£69.95
28008	12x8x32x8x	£89.00	£104.58	27717	Xp Professional	£136.13	£159.95
27615	DVD-RAM/DVD-R	£295.00	£346.62	27482	2000	£136.13	£159.95
				25569	Me	£59.59	£69.95

Supplied with **FREE** Printer Cable



Graphic Cards

	Ex VAT	Inc VAT
Asus GeForce 4 TV-Out		
28533 V8170 MX440 DDR 64mb	£89.00	£104.58
28631 V8440 Ti4400 128mb DDR DVI	£239.00	£280.83
28632 V8460 Ti4600 128mb DDR DVI	£295.00	£346.63

	Ex VAT	Inc VAT
ATI Radeon		
27904 7000 32MB DDR Retail VO	£49.00	£57.58
27899 7500 64MB DDR Retail DVI VO	£95.00	£111.63
28288 8500 64MB DVI	£265.00	£311.38
27902 8500 64MB DDR DVI VO	£172.00	£202.10
28201 8500LE 64MB DDR DVI TV DH OEM	£107.00	£125.73

	Ex VAT	Inc VAT
Creative GeForce 4 TV-Out		
28554 Graphics Blaster MX440 64Mb	£89.00	£104.58
28518 GraphicsBlaster Ti4400 128Mb DVI	£211.00	£247.93
28555 GraphicsBlaster Ti4600 128Mb DVI	£261.00	£306.68

	Ex VAT	Inc VAT
Gainward GeForce 4 TwinView		
28401 MX420 64mb AGP TV DVI	£62.00	£72.85
28402 MX440 64mb AGP TV DVI	£79.00	£92.83
28403 MX460 64mb AGP VIVO DVI	£112.00	£131.60
28759 Ti-4200 128mb VIVO DVI	£169.00	£198.58
28404 Ti-4400 128mb VIVO DVI	£219.00	£257.33
28405 Ti-4600 128mb VIVO DVI	£269.00	£316.08

	Ex VAT	Inc VAT
Leadtek GeForce 4 TV-Out		
28441 MX440 64mb TV DDR	£82.00	£96.35
28681 Ti4400 Ultra 128mb DDR DVI RT	£225.00	£264.38
28633 Ti4600 Ultra 128mb DDR DVI	£289.00	£339.58

	Ex VAT	Inc VAT
Matrox Millennium		
27624 G550 32mb DDR (OEM)	£79.00	£92.83
27929 G550 32mb DDR	£75.00	£88.13

	Ex VAT	Inc VAT
Matrox Marvel		
26578 G450 eTV 32Mb DDR	£159.00	£186.83
26579 G450 eTV 32Mb DDR (OEM)	£155.00	£182.13

	Ex VAT	Inc VAT
MSI GeForce TV-Out		
28627 GeForce 2 MX440 64Mb AGP (OEM)	£59.00	£69.33
28605 GeForce 4 MX440 64Mb AGP (OEM)	£75.00	£88.13
28628 GeForce 4 Ti4400 128mb AGP (OEM)	£185.00	£217.38
28629 GeForce 4 Ti4640 128Mb AGP (OEM)	£267.00	£313.73

	Ex VAT	Inc VAT
Videologic TV-Out		
28194 Vivid! XS 64Mb TV OUT	£79.00	£92.83
24185 Grafistar 670 OEM	£34.99	£41.11

Motherboards Motherboard Kits Available on Page 10. For larger selection visit our web site www.watford.co.uk

PartCode	26125	28190	28493	28519	26717	28519	27504	28513	27541	28115
Manufacturer	Abit	Abit	MSI	Asus	Gigabyte	Asus	Intel	MSI KT3ARU	MSI	MSI
Model	KT7-A	KT7A-RAID	KT3	A7V333-A	GA-7DXR	A7V333	D845WN	Pro RAID	K7T 266 Pro	850 Pro
CPU	Duron/Athlon	Duron/AthlonXp	Duron/AthlonXp	Duron/AthlonXp	Duron/AthlonXp	Duron/AthlonXp	P4	Duron/AthlonXp	Duron/AthlonXp	Pentium 4
Chipset	VIA KT133A	VIA KT266A	VIA KT333	VIA KT333	AMD 761/VIA 606B	KT333	Intel 845	VIA KT333	VIA KT1266	Intel 850
FSB	266MHz	266MHz	266MHz	266MHz	266MHz	266MHz		266MHz	266MHz	400MHz
RAM Type	SDRAM	DDR	DDR	DDR	DDR SDRAM	DDR	SDRAM	DDR	DDR	RDRAM
PCI	6	6	5	5	5	5	6	5	5	4
ISA	1	0	0	0	0	0	0	0	0	0
AGP	AGP x4	AGP x4	AGP x4	AGP x4	AGP x4	AGP Pro	AGP x4	AGP x4	AGP x4	AGP x4
Graphics	No	No	No	No	No	No	No	No	No	No
Sound	No	No	6 Channel	AC97	Creative CTS880	Cmedia 8738	adi 1885	6 Channel	VIA AC97 CODEC	Intel AC97 CODEC
Memory Slots	3	3	3 DDR	3 DDR	3	DDR	3	3 DDR	3	4
Form Factor	ATX	ATX	ATX	ATX	ATX	ATX	ATX	ATX	ATX	ATX
USB Ports	4	2	6	4	4	4	2	6	4	4
IDE Controller	2xATA 100	2x ATA 100 2xATA 100 RAID	2x ATA 133	2x ATA 133	2x ATA 100, 2x ATA 100 RAID	2xATA 133/100/66	ATA 100	2x ATA 133 2xATA 133 RAID	2x ATA 100	2x ATA 100
Ex VAT	£62.00	£79.00	£74.00	£99.00	£73.00	£99.00	£85.00	£99.00	£74.00	£89.00
Inc VAT	£72.85	£92.82	£86.95	£166.32	£85.77	£116.32	£99.87	£116.32	£86.95	£104.57

Processors

	Socket	Ex VAT	Inc VAT
AMD			
27596 Duron 1.0 Ghz 200mhz	A	£38.00	£44.65
28125 Duron 1.1 Ghz 200mhz	A	£46.00	£54.05
28126 Duron 1.2 Ghz 200mhz	A	£47.00	£55.23
28362 Duron 1.3 Ghz 200mhz	A	£65.00	£76.38
27808 Athlon XP 1600 1.4Ghz	A	£72.00	£84.60
27809 Athlon XP 1700 1.47Ghz	A	£79.00	£92.83
27810 Athlon XP 1800 1.53Ghz	A	£86.00	£101.05
28090 Athlon XP 1900	A	£104.00	£122.20
28300 AMD Athlon XP 2000	A	£144.00	£169.20
28634 AMD Athlon XP 2100	A	£169.00	£198.58

	Socket	Ex VAT	Inc VAT
Intel			
27350 PII Celeron 1.1GHz	370	£57.00	£66.98
28091 PII Celeron 1.2GHz	370	£61.00	£71.68
28407 Celeron 1.3GHz	370	£65.00	£76.38
28771 Celeron 1.4GHz	370	£79.00	£92.83
27351 Pentium III 1.13GHz	370	£129.00	£151.58
27358 Pentium 4 1.7Ghz	478	£112.00	£131.60
27359 Pentium 4 1.8Ghz	478	£135.00	£158.63
27360 Pentium 4 1.9Ghz	478	£149.00	£175.08
27361 Pentium 4 2Ghz	478	£169.00	£198.58
28406 Pentium 4 2.2Ghz	478	£199.00	£233.83
28774 Pentium 4 2.4Ghz	478	£321.00	£377.18
28776 Pentium 4 2.5Ghz	478	£506.00	£594.55

Memory

	Ex VAT	Inc VAT
SDRAM PC133		
23850 64Mb 168 Pin for 133MHz Bus	£17.00	£19.98
23851 128Mb 168 Pin for 133MHz Bus	£25.00	£29.38
24195 256Mb 168 Pin for 133MHz Bus	£47.00	£55.23
26245 512Mb 168 Pin for 133MHz Bus	£79.00	£92.83

	Ex VAT	Inc VAT
DDR PC2100		
26383 128MB 184Pin DIMM	£26.00	£30.55
26384 256MB 184Pin DIMM	£47.00	£55.23
27801 512MB 184Pin DIMM	£115.00	£135.13

	Ex VAT	Inc VAT
DDR PC2700		
28514 256MB 184Pin DIMM	£65.00	£76.38
28515 512MB 184Pin DIMM	£132.00	£155.10

	Ex VAT	Inc VAT
RAMBUS 800MHZ		
27466 64mb Non-ECC RIMM	£19.90	£23.38
26741 128mb Non-ECC RIMM	£39.00	£45.83
26742 256mb Non-ECC RIMM	£79.00	£92.83

	Ex VAT	Inc VAT
CompactFlash		
22682 32Mb	£28.00	£32.90
25940 64Mb	£25.00	£29.38
25938 128Mb	£39.00	£45.83

	Ex VAT	Inc VAT
Smart Media		
26382 32Mb	£19.00	£22.33
27479 64Mb	£23.00	£27.03
22679 128Mb	£59.00	£69.33



Gainward PartCode 28759

GeForce4 TI-4200

The GeForce4 Ti-4200 GPU in combination with Gainward's unique High-Performance/Wide-Bandwidth hardware design, 128MB 4.0ns DDR memory, two VGA connectors, DVI, plus video-in and video-out offers by far today's best price/performance ratio and will again easily blow away competitive products simply based on NVIDIA's reference design. The Gainward GeForce4 PowerPack! Ultra/650 XP "Golden Sample"™ will continue Gainward's tradition of offering advanced, leading edge, products for the utmost enthusiastic 3D gaming community at a very reasonable price.

£169 Ex VAT **£198.58** Inc VAT

Abit PartCode 28706

AT7 Motherboard

ABIT is still the hot favorite among overclockers and DIY enthusiasts. The AT7 based on VIA KT333CE chipset removing the PS/2 legacy ports replacing them with 4 USB 1.1 ports, 2 USB 2.0 ports and 2 Firewire ports. Up to 12 IDE devices can be attached.



£122 Ex VAT
£143.35 Inc VAT

CPU Fans

	Ex VAT	Inc VAT
Various		
25005 Socket A Athlon/Duron/S370/Skt 7 Fan & Heatsink	£5.00	£5.88
28281 Coolermaster SocketA upto AMD XP1900 Fan/Heatsink	£12.00	£14.10
28482 Coolermaster Thermal Compound Kit Retail	£3.99	£4.69
27813 P4 Socket 478 2.0Ghz Heatsink+Fan	£12.00	£14.10

CoolerMaster PartCode 28479

CPU Cooler, Socket A, 370, 478

Best performance to noise ration. Long life Ball-bearings. Spring clip for easy installation. Ideal cooler for overclocking. Fits Celeron 1.5GHz and higher PIII 1.3GHz + Athlon 1.8GHz Athlon 4 up to 2.2GHz Duron 1GHz +



£29.00 Ex VAT **£34.00** Inc VAT

CDR/CDRW Disk Drives

	Ex VAT	Inc VAT
Benq (Acer) Internal IDE		
28531 CDRW 32x10x40x	£57.00	£66.97
28532 CDRW 40x12x48x	£89.00	£104.58

BTC Internal IDE

28713 BCE3212IM CDRW 32x10x40	£55.00	£64.63
-------------------------------	--------	--------

Iomega

28206 CDRW 10x16x40x USB 2.0 Ext.	£115.00	£135.13
27100 ZipCD Predator Firewire adapter	£69.00	£81.08

Lite-On Internal IDE

28278 32x12x40x CDRW	£57.00	£66.98
28457 40x12x48x CDRW	£69.00	£81.08

Philips Internal IDE

28373 PCRW2412K 24x12x40 CDRW	£53.00	£62.28
28450 PCRW3210K 32x10x40 CDRW	£79.50	£93.41

Plextor Internal IDE

28398 PX-W4012TA 12x40x40x CDRW	£99.00	£116.33
---------------------------------	--------	---------

Yamaha Internal IDE 24x10x40x

28082 CRW3200E-VK	£82.00	£96.35
28083 CRW3200X-VK Firewire Ext	£144.00	£169.20
28084 CRW3200UX-VK USB 2	£136.00	£159.80
28085 CRW3200SX-VK SCSI Ext	£149.00	£175.08

Intenso PartCode 28116

25x 80min 24 speed CD's
£5.00 Ex VAT **£5.87** Inc VAT



Intenso PartCode 28355

25x 90min 24 speed CD's
£9.95 Ex VAT **£11.69** Inc VAT



IDE Hard Drives

	Ex VAT	Inc VAT
Seagate Ultra ATA 100		
Covered By 3 Year Limited Manufacturer Warranty		
27054 ST340810A 40.6GB 5400RPM	£53.00	£62.28
27055 ST360020A 60GB 5400RPM	£65.00	£76.38
27056 ST380020A 80GB 5400RPM	£85.00	£99.88

Seagate Barracuda ATA IV 100

28037 ST320001A 20Gb 7200RPM	£56.00	£65.80
28038 ST340016A 40Gb 7200RPM	£62.00	£72.85
28039 ST360021A 60Gb 7200RPM	£78.00	£91.65
28040 ST380021A 80Gb 7200RPM	£99.00	£116.3

Western Digital Ultra ATA

Covered By 3 Year Manufacturer Warranty		
23834 WD200EB 20.5Gb 5400RPM	£52.00	£61.10
26370 WD400AB 40Gb 5400RPM	£56.00	£65.80
26371 WD600AB 60Gb 5400RPM	£69.00	£81.08
26373 WD400BB 40Gb 7200RPM	£68.00	£79.90
27429 WD800BB 80Gb 7200RPM	£93.00	£109.28
27428 WD800BB 80Gb 7200RPM I	£161.66	£189.

Western Digital UIDE

28078 100Gb UIDE 5400rpm	£139.00	£163.33
28079 120Gb UIDE 5400rpm	£148.00	£173.90

IBM EIDE/Ultra ATA-100 7200RPM

Covered by 3 Years Manufacturer Warranty		
28447 Deskstar 120GXP 40Gb	£59.00	£69.33
28654 Deskstar 120GXP 60Gb	£70.00	£82.25
28448 Deskstar 120GXP 80Gb	£81.00	£95.18
28449 Deskstar 120GXP 120Gb	£149.00	£175.08

Maxtor EIDE UDMA 100

27395 540X 40Gb 2Mb 12ms 5400RPM	£58.00	£68.15
27396 540X 60Gb 2Mb 12ms 5400RPM	£62.00	£72.85
27397 540X 80Gb 2Mb 12ms 5400RPM	£79.00	£92.83
28041 540X 120Gb 2Mb 12ms 5400RPM	£125.00	£146.88

Maxtor EIDE UDMA 133

28041 540X 120Gb 2Mb 5400RPM	£125.00	£146.88
28042 540X 160Gb 2Mb 5400RPM	£165.00	£193.88
28044 740X 40Gb 12ms 7200rpm	£56.00	£65.80
28045 740X 60Gb 7200rpm	£69.00	£81.08
27909 740X 80Gb 12ms 7200rpm	£89.00	£104.58

CDRW/DVD Combo Drives

	Ex VAT	Inc VAT
Various		
28008 LG 12x8x32 8x	£89.00	£104.58
25360 Ricoh MP9120A-DP 12x10x32x8x	£110.00	£129.25

DVD Drives

	Ex VAT	Inc VAT
Various		
27816 BTC 16x Internal IDE	£45.00	£52.88
24996 Pioneer 16X Int Slot Bare ATAPI	£52.00	£61.10
27598 Lite-On 16x 48x Internal IDE	£39.00	£45.83

Acer PartCode 28388 CRW-3210A CDRW

The Acer CRW-3210A offers the latest in CD-RW speed and quality.

32X Writing, 10X Rewriting, 40X Reading, Seamless Link technology! 2MB Buffer Size. Flash Memory / Upgrade System. E-IDE / ATAPI Interface. Popular Recording Software Package. Anti-Vibration System Play/Skip function buttons on panel. Emergency Eject. Dust protection design. Power Saving Feature

Accessories

Nero CD burning software
 4X black ReWritable CD
 Quick installation guide & Audio cable. DOS device driver disk (3 1/2" floppy)

£57 Ex VAT **£66.97** Inc VAT



CD Media

	Ex VAT	Inc VAT
28120 Intenso 80min CDR (10 Pack) 24x	£3.90	£4.58
27925 80min CDR (10 pack) 24x	£2.12	£2.49
28116 Intenso CD-R80 25 spindle 24x	£5.00	£5.88
26637 Intenso CD-R80 50 spindle 24x	£9.00	£10.58
28005 CD-R80 100 pack 24x	£17.00	£19.98
28355 Intenso CD-R90 25 spindle 24x	£9.95	£11.69
16348 Press-it CD Labelling Kit	£16.00	£18.80
28475 Press It CD Labelling Kit Lite	£8.50	£9.99
17251 Press itPack of 50 White Labels	£4.95	£5.82

Pressit PartCode 28541

CD Labelling Kit

80-minute CD Media.
 100-pack mounted on a spindle. Suitable for up to 16x CD-Writers/Create stunning labels in seconds. Sample pack of high quality CD labels & Jewel Case Insert. Guarantees accurately centred labels. Quick and Easy to use.

£22 Ex VAT **£25.85** Inc VAT



Editors Choice

Philips PartCode 28162

DVDRW208 DVD+RW

Philips' new DVDRW208 DVD+RW drive is one of the most powerful optical recording solutions we've tested, and it works very well. This internal IDE drive comes with a great software bundle and some advanced features like Seamless Link to ensure you have a great experience using it.

DVD+RW is a competing standard to DVD-RAM that was released over a year ago. The problem inherent to DVD-RAM is that it requires the use of proprietary media cartridges that cannot be played back in any device other than a DVD-RAM drive. DVD+RW, on the other hand, lets you record onto a blank 4.7GB (Gigabyte) disc and play it back in any DVD player, even a set-top box. It's because of this level of compatibility that the DVD+RW format is taking off.



£289 Ex VAT
£316.07 Inc VAT

PC Cases

PartCode	Case Size	Power Supply	Board Size	Expansion Slots	Drive Bays	Ex VAT	Inc VAT
27589	ATX Midi,	250 Watt,	Full ATX,	7 Full 2 Half,	2x5.25" 1x3.5"	£25.00	£29.37
27587	ATX Midi,	300 Watt,	Full ATX,	7 Full 2 Half,	2x5.25" 1x3.5"	£38.25	£44.95
27712	ATX Midi,	300 Watt,	Full ATX,	7 Full 2 Half,	3x5.25" 2x3.5"	£38.25	£44.95
21365	Full Tower,	250 Watt,	Full ATX,	7 Full 2 Half,	6x5.25" 2x3.5"	£39.00	£45.83
17470	ATX Desktop,	255 Watt,	Full ATX,	7 Full 2 Half,	2x5.25" 2x3.5"	£36.99	£43.46

Sound Cards

	Ex VAT	Inc VAT
Creative SoundBlaster		
27573 4.1 Digital	£22.00	£25.85
27574 5.1 Digital	£45.00	£52.88
27570 Audigy Player	£65.00	£76.38
27571 Audigy Platinum	£132.00	£155.10
27572 Audigy Platinum EX	£169.00	£198.58
28508 Extigy - External USB S/Card	£117.00	£137.48

Speakers

	Ex VAT	Inc VAT
26733 Altec Powercube 3 peice 200w PMPO	£30.25	£35.54
27582 Creative FPS1600	£42.25	£49.64
27583 Creative Inspire 5.1 5300 Surround	£75.50	£88.71
27584 Creative Inspire 5.1 5700 Surround	£212.25	£249.39
25243 Creative SBS 35	£12.25	£14.39
27931 Creative SoundWorks CSW-320 2.1 Black	£28.28	£33.23
24749 Creative SoundWorks Digital Sys	£51.25	£60.22
28189 Aries Surround Sound System 120W	£82.25	£96.64
25649 Philips A1.2 Fun 50 watts	£11.25	£13.22
25653 Philips A2.3 250watt, 2 spk's + Sub	£35.25	£41.42
28375 Videologic ZXR-500 5.1 Channel System	£59.25	£69.62

Philips PartCode 28428

A2.600 5.1 Compact Surround Power

Multimedia 5.1-Channel Speaker System.
 Active High Power 50 Watts (RMS)
 Compact Powerful Subwoofer, Rich, deep bass
 a deceptively small enclosure. Aerodynamic front firing design, High Clarity Satellite Speakers, Easy Placement, 5 meters of wire, Wall mounting as an option, Remote Control, Bass Boost, Magnetically Shielded.

£49 Ex VAT **£57.57** Inc VAT



Videologic PartCode 28375

ZXR-500

5.1 Channel Amplified Speaker System

65W RMS, Connects to any 5.1 soundcard or DVD Player with decoder, Powerful dual-ported sub-woofer, Perfect for home cinema, games or music, Capable of reproducing Dolby Digital and DTS Soundtracks, Stylish and compact silver design

£57 Ex VAT **£66.97** Inc VAT



Editors Choice



Motherboard Kits

No one predicted the amazing success of our motherboard kits. Not only do they ensure peace of mind for compatibility but also in addition offer reassuringly competitive price. Log on to our web-site www.watford.co.uk/ for other motherboard kits available.

Receive your kit fully-assembled and soak tested for an additional **£9.99** Ex VAT **£11.74** Inc VAT

Duron® 1GHz PartCode 28381
Duron 1GHz + Fan + MSI MS-6378 MotherBoard + 256Mb Memory
£129.00 Ex VAT **£151.58** Inc VAT

Athlon® 1.4GHz PartCode 27586
Athlon 1.4GHz + Fan + MSI MS-6380 MotherBoard + 256Mb Memory
£179.00 Ex VAT **£210.33** Inc VAT

Athlon® XP1700 PartCode 28071
Athlon XP1700 + Fan + MSI MS-6380 MotherBoard + 128Mb DDR Memory
£189.00 Ex VAT **£222.00** Inc VAT

Celeron® 1GHz PartCode 28390
Celeron 1GHz + Fan + MSI MS-6368 MotherBoard + 128Mb Memory
£119.00 Ex VAT **£139.83** Inc VAT

Intel® PIII 1GHz PartCode 27281
Intel PIII 1GHz + Fan + MSI MS-6368 MotherBoard + 256Mb Memory
£189.00 Ex VAT **£222.08** Inc VAT

Intel® P4 1.6GHz PartCode 28702
Intel P4 1.6GHz + Fan + MSI MS-6524GL MotherBoard + 256Mb Memory
£209.00 Ex VAT **£245.58** Inc VAT

Digital Cameras

Ex VAT Inc VAT

Canon

27494	PowerShot A20	£252.00	£296.10
25388	Digital IXUS	£372.00	£437.10
26786	Digital IXUS 300	£389.00	£457.08
27907	Powershot G2	£528.00	£620.40

FujiFilm

25363	FP-1300	£128.00	£150.40
28217	FinePix 2600	£219.00	£257.33
28431	AXIA-100	£119.00	£139.83
28173	Finepix A101	£116.50	£136.89
28174	Finepix A201	£169.00	£198.58
26368	FP-6800	£479.00	£562.83
26810	Im FP-6900	£529.00	£621.58

Epson

28723	PhotoPC 2100Z	£269.00	£316.08
26885	PhotoPC 3100Z	£416.00	£488.80

Olympus

26417	C1	£165.00	£193.88
27300	C1 Zoom	£206.00	£242.05
28305	C-2 Zoom	£205.00	£240.88
28304	C-100	£199.00	£233.83
27107	C-700	£465.00	£546.38
28306	C3020Z	£399.00	£468.83
27610	C40Z Zoom	£535.00	£628.63
27458	C-4040Z Camedia	£599.00	£703.83
26493	E-10 SLR	£979.00	£1,150.33

Kodak

26808	DX3500	£169.00	£198.58
26809	DX3600	£183.00	£215.03
28202	DX3700	£225.00	£264.38
27297	DX3215	£137.00	£160.98
27298	DX3900	£259.00	£304.33
28601	DX4900	£315.00	£370.13

Networking

	Ex VAT	Inc VAT
Various		
28735	Intel Pro Wireless 2011 USB Ethernet	£89.00 £104.58
28736	Intel Wireless Ethernet Gateway (11MB)	£129.95 £152.69
28737	Intel PRO 2011 Adapter/ENet PC Card Wireless I	£105.00 £123.38
28738	Intel Pro Wireless 2011 11MB Access Point	£349.00 £410.08
28739	Intel Pro Wireless 2011 LAN PC Card PCMCIA	£65.00 £76.38
28205	Excel 10/100 USB Adaptor	£19.00 £22.33
27475	Linksys LNE-950TX 10/100	£13.00 £15.28

Video Conferencing

	Ex VAT	Inc VAT
Various		
28427	Creative Labs PC Cam 600 16mb 3-in-one Camera	£99.00 £116.33
27594	Creative Labs Webcam 5 USB	£29.00 £34.08
28512	Creative Labs WebCam USB	£29.00 £34.08
25444	Logitech QuickCam Pro 3000 VC, USB	£49.00 £57.58
28054	Modular Technology Pocket Cam 100	£35.00 £41.13
28160	Philips WebCam Pro 3D USB PCVC750K	£60.00 £70.50
26001	Philips Toucam Fun USB PCVC730K	£36.00 £42.30
25546	Philips Toucam Pro USB Webcam PCVC740K	£48.00 £56.40

Projectors

	Ex VAT	Inc VAT
Various		
28696	CTX PS-5110 SVGA 1000 ansi	£1,499.00 £1,761.33
28289	Epson EMP-51 LCD	£1,599.00 £1,878.83
28290	Epson EMP-71 LCD	£1,799.00 £2,113.83
28434	Philips CSmart 1000 lms Svga	£1,402.00 £1,647.35
27779	VPL-Cs4 LCD SVGA 1000 ANSI	£1,309.00 £1,538.08

Digital Audio Players

	Ex VAT	Inc VAT
Various		
28485	Aries MP3 32MB	£49.00 £57.58
26876	Archos Jukebox 6000 6Gb Storage	£189.00 £222.08
27933	Creative DAP Jukebox 20Gb	£249.00 £292.58
26577	Diamond Rio 800 128Mb	£169.00 £198.58
25242	Creative Labs Jukebox	£152.00 £178.60

PalmTops

	Ex VAT	Inc VAT
Various		
28576	iPAQ H3870 64MB SD Slot Bluetooth	£489.00 £574.58
28063	HP Jornada 565 Colour 32MB	£399.00 £468.83
27711	Palm M125 8Mb	£129.00 £151.58
28585	Palm M130 8Mb	£173.00 £203.28
26606	Palm m500 8Mb Mono	£199.00 £233.83
28588	Palm m515 16Mb Colour	£285.00 £334.88
28546	Sony Clie T625 16mb DRAM Palm	£299.00 £351.33

Scanners

	Ex VAT	Inc VAT
27636	Canon CanoScan N670U	£55.00 £64.63
27637	Canon CanoScan N1240U	£142.00 £166.85
27638	Canon CanoScan N1240U	£89.00 £104.58
27388	Epson Perfection 1250U	£66.99 £78.71
27389	Epson Perfection 1250U Photo	£89.99 £105.74
27390	Epson Perfection 1650U	£112.00 £131.60
27391	Epson Perfection 1650U Photo	£134.00 £157.45
28112	Epson Perfection 2450U Photo	£224.00 £263.20
28150	HP Scanjet 2200C A4 Flatbed USB	£50.00 £58.75
27305	HP Scanjet 4400C	£70.00 £82.25
27307	HP Scanjet 5400C	£119.00 £139.83
27308	HP Scanjet 5470C	£158.00 £185.65
28242	Microtek ScanMaker 3800	£62.00 £72.85
28384	Microtek ScanMaker 4800	£99.00 £116.33

Epson PartCode 28112

Perfection 2450U Photo

True 2400x4800 dpi high quality scanning. USB 2.0 & 'Firewire' interfaces. Built-in 4" x 9" Transparency Unit. 48-bit colour scanning. Ultra fast scanning speeds for better efficiency. New EPSON TWAIN 5.5. QuickStart button & intelligent Smart Panel interface for one-touch scanning! New Adobe Photoshop Elements imaging software. On-Chip Microlens Technology for increased image clarity & detail. 'Scan to Web' button to share your photo's.



£224 Ex VAT **£263.20** Inc VAT

Modems & ISDN

	Ex VAT	Inc VAT
Various		
28778	Aries ADSL USB Modem	£59.00 £69.33
21484	Aries K56 55.6 Internal PCI PnP	£16.98 £19.95
28424	Creative Modem Blaster 56K V92	£32.00 £37.60
20943	Diamond Supra Express 56i Pro	£31.00 £36.43
26148	Hayes Accura 56K V92 External	£59.00 £69.33

Sitecom PartCode 28534

Multi Memory Reader/Writer

USB Connection. CF, SM, MS, SD, MMC and Microdrive compatible. All types of media can be used at once. Including USB connection cable. Win 98/ME/2000/XP/Mac compatible.

£59 Ex VAT **£69.32** Inc VAT

Copy from any media.... to any Media



Creative PartCode 28427

PC Cam 600

Extensive still image quality and storage options include 200 images at 640x480 (VGA), 85 images at 1024x768 (XGA), and 20 images at 1280x960 (1.3 megapixels). Up to 75 seconds of video at 352x288 (SIF) resolution and 15fps with audio, or up to 60 minutes of audio-only recording.

£99 Ex VAT **£116.33** Inc VAT



FujiFilm

PartCode 28217

FinePix 2600 Zoom

2.1 MegaPixel CCD with simple user-friendly controls and easy USB computer connection. A sliding lens cover protects the lens during storage. It fits discreetly into a purse or pocket. Featuring a Fujinon 3X optical / 25X digital zoom, video recording, and PC-Cam Internet mode. Fujifilm's Advanced Color Technology captures near film-like digital color. Set to automatic, or select manual for greater control over each exposure. 16 MB SmartMedia™, 2 NiMH AA batteries & Charger; Cables, PhotoDeluxe™.

£219 Ex VAT **£257.32** Inc VAT





Creative PartCode 28508

SoundBlaster Extigy

Introducing Sound Blaster Extigy-the fully external Sound Blaster for your PC or notebook. Simply connect it to the outside of your PC or notebook and experience stunning digital audio fidelity with Sound Blaster Extigy's 24bit/96kHz DACs at 100dB SNR clarity.

24-bit multi-channel performance with 100dB SNR clarity. Transform your PC into a home-theater with Dolby Digital 5.1 surround sound. Enrich your listening experience with innovative EAX ADVANCED HD music enhancement tools.

£114.89 Ex VAT **£134.99** Inc VAT



Pinnacle PartCode 28547

Studio Deluxe

Pinnacle Studio Deluxe delivers everything you need to make fantastic Digital movies on your PC, all in one easy to use package. Pinnacle Studio Deluxe includes full versions of Pinnacle Studio version 7, Pinnacle Express and Pinnacle Hollywood FX for Studio. In addition, Pinnacle Studio Deluxe includes the new Pinnacle AVDV Analog and Digital video capture card for super high quality capture from just about any source. From Analog or Digital video capture and editing all the way through to burning a disc to play on your set top DVD player, Pinnacle Studio Deluxe makes it easy to make great movies at home.

£217 Ex VAT **£254.97** Inc VAT



Epson PartCode 27580

C80

20ppm high quality plain paper printer. Money saving separate ink cartridges. Laser-crisp text and vibrant colour up to 2880 dpi. Smudge proof and water-proof pigment based inks. 4 colour printing for a wide range of printing applications. Intellidrive system providing accurate ink information for each individual colour tank. EPSON 3pi Ultra Micro Dot with Variable Sized Droplet Technology. 150 auto sheet feeder for large print runs and multiple document handling. Parallel and USB connectivity

£116 Ex VAT **£136.30** Inc VAT



Canon PartCode 28369
S9000 Bubblejet Printer

Capable of printing borderless A3 photos in approximately two and a half minutes and A4 photos in only one and a half minutes, it combines fast speeds with brilliant output. The S9000 delivers exquisite prints that look just like genuine silver-halide photos. To attain such fast print speeds, the Bubble Jet S9000 features sophisticated print head technology, bi-directional printing and a super efficient paper feeder for smooth paper handling.

£347 Ex VAT **£407.72** Inc VAT

Canon Inkjet

	Ex VAT	Inc VAT
28364 S300	£69.00	£81.08
28365 S520	£145.00	£170.38
28366 S750	£155.00	£182.13
28367 S820D	£325.00	£381.88
5820	£219.00	£257.33
28368 S900	£325.00	£381.88
28369 S9000	£347.00	£407.73

Epson Stylus

	Ex VAT	Inc VAT
27035 C205X	£44.00	£51.70
27036 C20UX	£44.00	£51.70
27038 C405X	£52.00	£61.10
27039 C40UX	£52.00	£61.10
27740 C60	£59.00	£69.33
27741 C70	£89.00	£104.58
27580 C80	£116.00	£136.30
23455 Colour	£192.00	£225.60

Epson Stylus Photo

	Ex VAT	Inc VAT
27755 810	£74.00	£86.95
25681 890	£126.00	£148.05
26858 895	£133.00	£156.28
28758 950	£289.00	£339.58
25682 1290	£259.00	£304.33

Hewlett Packard Deskjet

	Ex VAT	Inc VAT
27543 656c	£40.00	£47.00
27544 845c	£60.00	£70.50
27545 920c	£68.00	£79.90
27546 940c	£81.00	£95.18

Hewlett Packard PhotoSmart

	Ex VAT	Inc VAT
27548 P100	£102.00	£119.85
27550 P1115	£137.00	£160.98
25258 1215	£177.00	£207.98
27551 1315	£226.00	£265.55

Lexmark Inkjet

	Ex VAT	Inc VAT
28732 Z55	£79.00	£92.83
28733 Z65	£125.00	£146.88
28734 Z65N	£169.00	£198.58

Brother Laser Printer

	Ex VAT	Inc VAT
27920 HL-1440	£185.00	£217.38
27581 HL-1450	£214.00	£251.45
28378 HL-1470N	£395.00	£464.13
25855 HL1650	£399.00	£468.83

Epson Laser Printer

	Ex VAT	Inc VAT
28720 AcuLaser C1000N	£799.00	£938.83
28433 EP-L5900L	£159.00	£186.83
28714 EPL-5900	£199.00	£233.83

Hewlett Packard Laserjet

	Ex VAT	Inc VAT
27560 1000w	£177.00	£207.98
26250 1200	£229.00	£269.08
26317 1200N	£339.00	£398.33
27561 2200	£425.00	£499.38
26249 2200D	£479.00	£562.83

Kyocera Laserjet

	Ex VAT	Inc VAT
27362 FS-1000+	£235.00	£276.13
25610 FS1800	£575.00	£675.63
25614 FS3800	£745.00	£875.38

Panasonic Laser Printer

	Ex VAT	Inc VAT
27602 KXP-7100	£139.00	£163.33
28271 KXP-7105	£169.00	£198.57

Brother Multi-Function

	Ex VAT	Inc VAT
26351 MFC-9750	£569.00	£668.58

Hewlett Packard Multi-Function

	Ex VAT	Inc VAT
26782 1220	£389.00	£457.08
26251 3200	£399.00	£468.83
24158 G55	£228.00	£267.90
24159 G85	£305.00	£358.38
24160 G95	£385.00	£452.38
26877 PSC750	£160.00	£188.00
27557 PSC950	£230.00	£270.25

Canon Multi-Function

	Ex VAT	Inc VAT
24505 MultiPass C80n	£294.99	£346.61

Panasonic Multi-Function

	Ex VAT	Inc VAT
27192 Workio DP-150P	£729.00	£856.58
27193 Workio DP-150FP	£965.00	£1,133.88
28492 KX-FLB751	£385.00	£452.38

Hewlett Packard Consumables

	Ex VAT	Inc VAT
11522 350C/600/656 ..	£25.00	£29.38
22465 610C/640C/656 ..	£21.00	£24.68
24507 840/843/845C ..	£22.00	£25.85
24508 840/843/845/920/940C ..	£20.00	£23.50
24836 C20/C405X ..	£9.00	£10.58
24838 C20/C405X ..	£13.00	£15.28
27917 C60 ..	£19.95	£23.44
27918 C60 ..	£16.00	£18.80
28013 C70/C80 ..	£19.95	£23.44
28050 HP 51626A ..	£12.99	£15.26
28051 HP 51629A ..	£13.99	£16.49

Epson Consumables

	Ex VAT	Inc VAT
28015 C70/C80 ..	£9.99	£11.74
28016 C70/C80 ..	£9.99	£11.74
28014 C70/C80 ..	£9.99	£11.74
28048 810 ..	£8.90	£10.45
28049 810 ..	£9.90	£11.63
28052 C20/C40 ..	£6.99	£8.21
28053 C20/C40 ..	£9.99	£11.73

Printer Cables

	Ex VAT	Inc VAT
19777 USB	£8.46	£9.95
12385 Parallel	£8.46	£9.95

Special Feature

Panasonic

PartCode 27602

KX-P7100

The KX-P7100 laser printer from Panasonic is the ideal solution for desktop, SOHO and office environments. Equipped with auto duplex function, 2MB RAM and a 150-sheet output tray, it is optimized to support applications for Windows. The KX-P7100 also comes with a versatile manual feed, Auto Interface switching, and an ergonomic design, and the quality you have come to expect from Panasonic. Auto Duplex standard (prints on both sides of the page). 600 dpi resolution. Parallel and USB connectivity. Toner Save mode. Universal.

£139 Ex VAT **£163.33** Inc VAT



Panasonic

PartCode 28271

KX-P7105

A laser printer, which supports advanced PCL 6 emulation. Higher resolution printing (Max. 1200dpi x 600dpi), faster 100MHz RISC processor and standard 16MB RAM will assure higher quality printing for you at up to 14ppm. As standard interfaces, it has IEEE 1284 parallel and USB 1.1 port. Optional items such as 2nd feeder which allows a total of 800 paper stock, expandable memory up to 48MB capacity and PostScript level 2 upgradability ensures the KX-P7105 meets your various printing requirements and the Power and Toner saving features will assure cost efficiency.

£169 Ex VAT **£198.57** Inc VAT

Panasonic PartCode 28760

KX-FL501 Laser Fax

Plain Paper Fax/Copier/Phone With 10 ppm printing, 600 x 600 dpi resolution, Caller ID, fax pager call, 100# speed dialing, monitor speaker; enlarge/reduction, 15 sheet ADF, 150 sheet paper tray, up to 120 page document memory, sequential broadcasting, 14.4 Kbps modem, electronic volume control, 64 level halftone. 1 year warranty through Panasonic.

£205 Ex VAT **£240.89** Inc VAT



FREE TONER

The first 100 customers to purchase a Panasonic KXP7105 Laser Printer are eligible to receive a FREE Toner Cartridge worth **£69**.





AOC PartCode **24895**

LM500 15" TFT

The LM 500 combines the traditional design of the AOC Spectrum series with it's easy to use shuttle OSD. Packed into a minimised housing, bringing you the most modern technical features.

- Size 15"
- Visible Size 38.1cm
- Dot Pitch 0.3mm
- Hor. Frequency 30-60kHz
- Ver. Frequency 60-75Hz
- Low Radiation TCO99
- Standards CE, TÜV/GS

£249 Ex VAT **£292.58** Inc VAT



CTX PartCode **25592**

EX710F 17" CRT

A proud extension to the EX Series, the newest Executive "Flat" Series is a step-up from the regular Invar Shadow Mask flat square CRT technology. The monitor screen is truly flat! You'll get great image quality and performance all at an attractive price.

17" Invar Shadow Mask FST (16" Viewable Image Size).
0.25mm Dot Pitch. ARAG®
Screen Treatment

£136 Ex VAT **£159.80** Inc VAT



Guillemot PartCode **28011**

Prophet View 720

Hercules' track record of providing features that no one else offers, unique features that enhances the gaming experience, continues with the Prophetview 720. Unique in look and performance, the Prophetview 720 is like no other TFT flat panel LCD. It's sleek metallic-blue skin, digital titanium buttons, boomerang-like stand and enhanced video playback capability.

£315 Ex VAT **£370.12** Inc VAT



Pinnacle PartCode **28602**

DV Clip

Transfer footage from your DV camcorder to your PC for editing with absolutely no quality loss with the included Firewire card. Then edit using the award-winning Studio editing software. Choose your best shots and arrange them in any order. Add transitions and effects, professional looking titles and sound effects. You can even add a background music track that fits exactly with the mood and length of your movies. With StudioDVclip you have the full choice of digital output formats for watching your movies, on DV or VHS tape, VideoCD or files for the web.

£49 Ex VAT **£57.58** Inc VAT



Philips PartCode **25560**

107T21 17" Flat Monitor

LightFrame™ for brightest and sharpest display.

XSD Xtra Space Design™

for large screen display in a small footprint: World's shortest 17" Real Flat monitor with maximum depth of only 419 mm / 16.5". High-res. 0.25 mm dot pitch.

Autoscan covers horizontal frequencies up to 71kHz offering a maximum res. of 1280 x 1024 with flicker free display of 1024 x 768 at up to 89Hz

£145 Ex VAT **£170.37** Inc VAT

Editors Choice

Hauppauge PartCode **23511**

WinTV USB

WinTV-USB is a 125 channel cable-ready TV tuner. Easily installed via the USB port, you can watch television in a resizable window on your PC screen. It is also possible to print stills from whatever you're watching or record video clips from your camcorder. Add titles, soundtracks and special effects for professional-looking presentations.

£42.55 Ex VAT **£49.99** Inc VAT

LCD TFT

	Ex VAT	Inc VAT
AOC		
24895 15.2" LCD TFT	£249.00	£292.58
26118 17" LCD TFT	£379.00	£445.33

ADI MicroScan		
25721 1610 15"	£319.00	£374.83
28767 L712 17"	£559.00	£656.83
24701 9L 18"	£949.00	£1,115.08

Belinea		
28110 10 15 15 15"	£239.00	£280.83
25288 10 15 40 15"	£329.00	£386.58
25289 10 17 10 17"	£519.00	£609.83
24120 10 18 10 18"	£789.00	£927.08

CTX		
27137 PV505/Beige 15.1"	£287.00	£337.23
25713 PV505/Blue 15.1"	£287.00	£337.23
25714 PV520 15.1"	£297.00	£348.98

Hansol		
28358 530TFT 15"	£279.00	£327.83
26917 700F 17"	£599.00	£703.83

Iiyama		
28276 AS4315U 17"	£509.00	£598.08
28277 AS4332U 17"	£615.00	£722.63
28215 AS4314UT 17"	£459.00	£539.33
28529 AS4611UT 18"	£599.00	£703.83

LG Electronics		
28058 15" 563LE	£282.00	£331.35
26129 577LM 15.1"	£490.00	£575.75

Mitac		
28451 15 EX6 15" +Spkr	£299.00	£351.33
28175 17AES 17" +Spkr	£455.00	£534.63

NEC		
28124 1510+ 15"	£299.00	£351.33
28545 1550X 15"	£459.00	£539.33
20927 1810X 18"	£1,099.00	£1,291.33

Philips		
26570 150S - 15" XGA	£275.00	£323.13
26626 150B2 15"	£315.00	£370.13
26627 150P2 15"	£369.00	£433.58
28031 150P2M 15"	£369.00	£433.58
25567 150PIB 15.1" Black	£535.00	£628.63
25555 150X 15.1"	£523.00	£614.53
28729 180P2B 18.1"	£749.00	£880.08

Philips Plasma		
25558 420P 42"	£3,739.00	£4,393.33

Sony		
28294 SDM-M51D 15"	£399.00	£468.83
28279 SDM-N50R 15.1"	£589.00	£692.08
26509 M81 18.1"	£799.00	£938.83
25551 N50PS 15"	£525.00	£616.88
26510 N80 18.1"	£1,465.00	£1,721.38

CRT Monitors

	Ex VAT	Inc VAT
AOC Energy Pro		
10075 15" ELR .28mm	£79.00	£92.83
21934 7VLR 17" 0.27mm	£87.00	£102.23
28604 7VLR 17"+Speakers	£99.00	£116.33
22178 19" 0.26mm	£132.00	£155.10

AOC Flat Screen		
26117 17" 7Klr	£115.00	£135.13
26119 19" 9Klr	£179.00	£210.33

CTX		
18687 1769SE/VL700 17"	£99.00	£116.33
26113 EX700F 17"	£113.00	£132.78
25592 EX710F 17"	£136.00	£159.80
23751 PR711F 17"	£199.00	£233.83

Hansol FST		
25175 15" S10A	£79.00	£92.83
23961 17" 710P	£125.00	£146.88
25498 19" 920D	£195.00	£229.13
28607 920P 19"	£195.00	£229.13

Iiyama Vision Master		
26541 17" LS702U	£119.00	£139.83
27834 17" HM703UT	£169.00	£198.58
28359 19" HM903DT	£285.00	£334.88
25480 19" NF	£249.00	£292.58
28307 19"	£168.00	£197.40

Philips Lightframe		
25191 105521 15"	£89.00	£104.58
25560 107721 17"	£145.00	£170.38
25562 109520 19"	£195.00	£229.13

LG FST		
28106 795FT 17"	£179.00	£210.33
26797 915FT 19" USB Hub	£265.00	£311.38
28376 SW700S 17"	£120.00	£141.00

Mitsubishi Diamond		
25986 Plus 92 19"	£245.00	£287.88

Video / TV Cards

	Ex VAT	Inc VAT
Hauppauge WinTV		
24147 WinTV PRIMIO FM	£51.99	£61.09
22219 WinTV Theatre	£79.00	£92.83
23153 WinTV Go	£32.00	£37.60
23511 WinTV USB	£42.55	£50.00
24344 WinTV USB FM	£65.00	£76.38
27387 WinTV Nova-T PCI	£84.25	£98.99
24345 WinTV DVB-s	£155.00	£182.13
25272 WinTV PVR	£155.00	£182.13
26883 WinTV PVR USB	£139.00	£163.33

Matrox		
27426 Video Editing Suite	£675.00	£793.13

Pinnacle		
22803 Miro Studio PCTV PCI TV+ Teletext Capture + remote	£41.00	£48.18
28603 Express DV CD/DVD creation	£49.99	£58.74

26321 Studio Action USB/Pal capture	£37.00	£43.48
27534 Studio DV+ v7.0 PCI Firewire editing card	£105.00	£123.38
28602 Studio DVClip	£49.99	£58.74
28547 Studio Deluxe+analog+dv capture & editing solution	£217.00	£254.98



Aries
Slimline TFT PartCode **27003**
£239 Ex VAT **£280.83** Inc VAT

Index

Hardware

Clove Technology	259	Offtek	255
Computer Bargains	254	Panmer Plastics	253
Computerdigi.com	254	Paradigm Technology	262
E.C.B. Direct	265	Tonezone	265
Sterling Management Systems	260	Touchstone	262
Squire International	254	Squire International	264
Worth Data	257		

Software

Digital Data	255
Paradigm Technology	262
Rebellio Ltd	264
Softcover	253
Worth Data	257

Peripherals

Computer Bargains	256
Computerdigi.com	254
E.C.B. Direct	265
Paradigm Technology	262
Worth Data	257

Consumables

Cartex	264
CD-R Media	258
HVS Cartridge Services	263
Ink and Stuff	259
Manx Print Care	255

Memory

Offtek	255
Mr Memory	259

Barcode H'ware & S'ware

Worth Data	257
------------	-----

Services

Dataquest International	253
Digital Data	255
Panmer Plastics	253
Squire International	264
Friendly Mouse Company	259

Training

Rapid Results	261
---------------	-----

birdie
com

CD, 8cm disc and business CarD sleeves in Polypropylene, PVC and paper.

CD, 7", 10" and 12" masterbags. Plastic C-Shells in clear and various colours.

Clear calendar cases. Slim line jewel boxes.

Many more packaging solutions available.

Highest quality of multi-media packaging <> Free UK delivery on all orders over £20.00 All prices inclusive of VAT <> All credit and debit cards accepted <> Secure online ordering

www.birdie.com
Call 08707 43 99 66

Convert scanned drawings to CAD

NEW
"Colour Aware"
Pro version -
scan A0-size
drawings, etc, on
desktop scanners -
merge & vectorise



See our
web site
for details

Scan2CAD™ Pro -

Works with all drawings and scanner sizes, all PC CAD programs; converts to mono or colour DXF; Gap-Jumping; raster and vector editing tools; OCR; Batch Run.

Download a
free working
evaluation

Pro - £177.43
Regular £99.88

www.softcover.com
01223 424342

NO FIX NO FEE POLICY



DATAQUEST
INTERNATIONAL LTD
DATA RECOVERY
SPECIALISTS

A 24hr Comprehensive service offering a full range of in-lab recovery options with cleanroom facilities.

Call our Technical Support and Network Installation

Team on:-

Tel:- 07050 248584

Fax:- 02392 671330

Email:- dataq@globalnet.co.uk

Web:- www.dq-int.co.uk

FREE DIAGNOSTIC

LOST YOUR CRITICAL DATA

CALL US NOW

Computerdigi.com

MultiMedia & Internet Ready Business Systems From £254.47

Suki's £299.00 My T Mouse Special

AMD Saver System based on the Asus Terminator.

Includes: Asus Skt A M'Board, AMD Duron 1GHz CPU, 128MB PC133 SDR DIMM, 20GB Ultra ATA HDD, Sound, Video, 56K Modem, 10/100Mbps LAN, 4xUSB (2Front and 2Rear), Games port, 52xCD ROM, 15" Colour Monitor, Stereo Speakers, 1.44MB Floppy Drive, PS2 Keyboard & Mouse, Windows 98

£254.47 (£299 inc. VAT)

For a limited period only

Options

CRT-VA DVD Burn
 24x10x40 Burnproof - Add £30
 32x12x40 Burnproof - Add £50
 DVD ROM - from £25



SUKISA 1.0 amd Duron 1.0Ghz

ATX Midi Tower Case 250W-T.
 Gigabyte GA71XE-Skt A Motherboard
 AMD Duron 1000 Socket A CPU
 Athlon/PIII 1.2GHz Cooler Fan
 40GB UDMA Hard Disk
 32MB Gforce2 Video Card
 128MB DIMM 133MHz
 16x10x40 CD Re-Writer
 10/100 MBps Network Card
 15" SVGA Colour Monitor +*

£399.00 (£468.83 inc. VAT)

SUKISA 1.8 amd athlon 1800+

ATX Midi Tower Case - 300W
 Gigabyte 7ZXE 266FSB Skt A- DDR
 AMD Athlon XP-1800A (266) DDR CPU
 AMD Approved XP 1900 Cooler Fan
 60 GIG Hard Disk
 32MB GForce2 Video Card
 256MB DIMM 133MHz
 16x10x40 CD Re-Writer
 10/100 MBps Network Card
 15" SVGA Colour Monitor +*

£526.81 (£619 inc. VAT)

SUKISA 2.0 amd athlon 2000+

ATX Midi Tower Case - 300W
 Gigabyte 7ZXE 266FSB Skt A- DDR
 AMD Athlon XP-2000A (266) DDR CPU
 AMD Approved XP 2000 Cooler Fan
 60 GIG Hard Disk
 32MB GForce2 Video Card TV out
 256MB DIMM 133MHz
 24x10x40 CD Re-Writer
 10/100 MBps Network Card
 17" SVGA Colour Monitor +*

£569.36 (£669 inc. VAT)

SUKI 1.7 intel P4 1.7Ghz

ATX Midi Tower Case - 300W
 Intel KD845WNPAP P4 M/Board + Audio
 Intel P4 1.7GHz CPU
 P4 Approved Cooler Fan
 60 GIG Hard Disk
 32MB Gforce2 Video Card TV out
 256MB DIMM 133MHz
 24x10x40 CD Re-Writer
 10/100 MBps Network Card
 17" SVGA Colour Monitor +*

£569.36 (£669 inc. VAT)

SUKI 2.0 intel P4 2.0Ghz

ATX Midi Tower Case - 300W
 Intel KD845WNPAP P4 M/Board + Audio
 Intel P4 2.0GHz CPU
 P4 Approved 2.0Ghz Cooler Fan
 60 GIG Hard Disk
 32MB Gforce2 M64 Video TV Out
 256MB DDR PC2100MHz
 24x10x40 CD Re-Writer
 10/100 MBps Network Card
 17" SVGA Colour Monitor +*

£697.02 (£819 inc. VAT)

SUKI 2.2 intel P4 2.2Ghz

ATX Midi Tower Case - 300W
 Intel KD845WNPAP P4 M/Board + Audio
 Intel P4 2.2GHz CPU
 P4 Approved 2.2Ghz Cooler Fan
 80 GIG Hard Disk
 64MB GForce2 Video Card TV Out DVI
 512MB DDR DIMM PC2100MHz
 24x10x40 CD Re-Writer
 10/100 MBps Network Card
 17" SVGA Colour Monitor +*

£777.00 (£913 inc. VAT)

Monitors:

17" CRT - Add £30
 19" CRT - Add £70
 15" TFT LCD flat screen - Add £209
 17" TFT LCD flat screen - Add £369

Scanners:

USB - from £40
 Parallel - from £45

Printers:

Inkjet Colour - from £30
 Lazer - from £129

Software:

Windows XP Home - +£95
 Win XP Professional - +£139

* All Systems have 56K Modem
 3.5" Floppy Disk Drive
 PS2 Keyboard
 PS2 Mouse &
 Basic Windows as Standard

WE ACCEPT CHEQUES

(VIA EQUIFAX TRANSAX)

AND ALL MAJOR

CREDIT & DEBIT CARDS

All offers subject to availability
 and Sukisa Publications' Terms

BUSINESS LEASING

ONE YEAR FREE
 ONSITE WARRANTY

**BUY NOW
 PAY LATER
 CREDIT TERMS
 AVAILABLE**

Consumer Credit Licence No: 517975

Tel: 0871 871-6663 Fax: 0871 871-6627

For more unbeatable deals email sales@computerdigi.com for our catalogue or log in to:

www.computerdigi.com

Can't decide which handheld?



Phone a friend.



Compaq iPaq from £339 (398.32 inc VAT)
 Toshiba E570£389 (457.07 inc VAT)
 Palm m130£189 (222.07 inc VAT)
 Palm m515£299 (351.33 inc VAT)
 Psion 5mx£195 (229.13 inc VAT)
 Sony Clie T625C . .£275 (323.13 inc VAT)

Oregon Scientific products stocked

**Clocks,
Weather
Stations**



and more!

PRICES EXCLUDE
DELIVERY, SUBJECT TO
AVAILABILITY. ALL
TRADEMARKS
ACKNOWLEDGED.
ERRORS AND
OMISSIONS
EXCEPTED.
PRICES CORRECT AT
TIME OF GOING TO
PRESS

• Advice from real handheld experts •
 Immediate despatch • Secure web site
 for easy online ordering

www.clove.co.uk

0870 7270037



Order online at www.offtek.co.uk
 and take Advantage of FREE UK Delivery!

offtek .co.uk

Notebook Memory

Prices from	16MB	32MB	64MB	128MB
	£30	£20	£24	£35

Desktop Memory

Prices from	32MB	64MB	128MB	256MB	512MB
72 Pin Simms	£25	£56			
168 Pin Dimms	£20	£21	£34	£54	£114
184 Pin DDR Dimms	£36	£39	£58	£115	
Rambus Rimms	£32	£54	£84	£241	

Workstation/Server Memory

Dell PowerEdge, Sun Enterprise, Compaq Proliant,
 IBM Netfinity, HP Netserver & many more!
 For prices and available upgrades please visit our website
 at: www.offtek.co.uk or call our Freephone Salesline

Flash Memory

Prices from	32MB	64MB	128MB	256MB
Compact Flash	£16	£23	£39	£78
Smartmedia	£16	£21	£40	
Multimedia	£27	£39		
Secure Digital Card	£37	£53	£87	
Memory Sticks	£28	£38	£62	

Also, USB based card readers for all types of cards from £24.00

Free UK delivery for online orders!
 Over 30,000 memory products for Desktops,
 Notebooks, Printers, Servers, Workstations,
 MP3 Players, Network Routers, Handheld PC's
 Digital Cameras, and much more...



Memory for virtually all makes and models!
 Installation guides and memory faq's
 available online at www.offtek.co.uk

Need extra income? Earn commission selling
 OFFTEK products. See our website for details.

- ✓ All OFFTEK memory carries a lifetime warranty and is guaranteed 100% compatible.
- ✓ All OFFTEK memory is manufactured using Premium brand chips which ensures the highest level of reliability and compatibility.
- ✓ Our large stock holding ensures that the majority of our products are held in stock.
- ✓ Free telephone support with identifying and installing your memory.
- ✓ Official orders are welcome from plc's, government and educational establishments.

Freephone

0800 698 4100

Tel: 0121 722 3993 Fax: 0121 743 9845
 Brymar House, Walford Drive, Solihull, West Midlands, B92 9DW.
 All Trademarks & Registered Trademarks acknowledged.
 Prices subject to change without notice.
 E & OE. Prices ex VAT. P&P £5.00



No surcharge on Credit or Debit Cards.

www.printconsumables.com

**PRINTER CARTRIDGES DIRECT
 FROM Manx Print Care**

**CHEAPEST EPSON
 COMPATIBLES IN THE UK**

OUR 10TH YEAR AS THE SPECIALISTS FOR ALL
 MAKES AND MODELS
 MANUFACTURERS, REMANUFACTURERS &
 SUPPLIERS OF QUALITY PRINTER PRODUCTS TO
 THE UK, IRELAND & BEYOND. DISCOUNTS FOR
 BULK TO TRADE



●●● buy online ●●●
www.printconsumables.com

❖ BUSINESS ❖ PUBLIC SECTOR ❖ HOME USER ❖
 Preferred supplier to Government Users
**OVERNIGHT DESPATCH ON WIDE RANGE OF TONER CARTRIDGES
 - COMPATIBLE AND ORIGINAL**
 KEENEST PRICES ON QUALITY TONERS BAR NONE. WE SUPPLY OUR
 REMANUFACTURES TO MAJOR PLCs, AND THEY STAY WITH US! ENOUGH SAID.
 SUPPORTING HP LASERJET/CANON/NEC/BT & MANY OTHERS - RING FOR
 QUOTE - YOU WILL BE BACK FOR MORE!!

**JETMANX THE SUPERB REFILL INKS & KITS
 SPECIFICALLY FORMULATED FOR YOUR PRINTER**

(TRIED "UNIVERSAL" INKS? NO GOOD? TRY JETMANX!)
 FULL RANGE COVERING HP/CANON/EPSON/APPLE/LEXMARK/OLIVETTI
 INDIVIDUAL FORMULA FOR EACH MODEL

OVER 30 STARTER KITS AND OVER 70 INKS. Specially made for
 your printer. BUY THE BEST. Starter kits from £10.95 incl with
 full clear instructions give between 3 to 9 fills according to
 model. Bulk inks available from 60ml upwards.
 Inks now available for new Lexmark printers and
 HP2000/2500 printers and Canon BJC 3000/6000
**VISIT OUR WEBSITE FOR INK LISTINGS AND SEE WHY THERE IS
 NO SUCH THING AS "UNIVERSAL" INK. ABOUT 80% OF OUR INK
 ORDERS ARE REPEATS OR PERSONAL RECOMMENDATIONS.**

TEL or FAX FREE on TEL 0800 0 19 06 07

FAX 0800 0 56 66 10

OVERSEAS: (+44) 1624 801159

E-Mail: info@printconsumables.com

Mail: Clock Tower Industrial Park, Foxdale IM4 3HF

* SURESHARP PAPERS * REFILL TONERS
 * NEW! COMPATIBLE COLOUR TONERS

QUALITY RIBBONS TO SUIT DOT MATRIX PRINTERS, POINT OF SALE MACHINES, ETC. HUGE
 RANGE. OUR REPUTATION IS YOUR GUARANTEE

CD SERVICES

Contact Digital Data for full details on all aspects of :

- Short run duplication
- Ink jet printing
- Screen-printing
- Credit Card CDs
- Design
- Mastering
- Pressing
- Packaging
- Distribution
- Media
- CD Printers
- CD Duplicators

Fast turnaround and competitive pricing are standard. Ink jet
 printed CD-Rs have no minimum print run, they can be
 identified by serial number at no extra cost and are usually
 ready in 2 days from order.

We also have several years experience of preparing CDs that
 take full advantage of the Adobe Acrobat file format. We
 are expert in converting your existing paper and electronic
 material to Acrobat format. Acrobat is the ideal cross-
 platform format for delivering items such as product
 brochures, annual reports, slide shows and conferences.

Digital Data Ltd

Tel: 01732-460421 Fax: 01732-740992

Email: sales@d-data.co.uk

Web: <http://www.d-data.co.uk>

www.computerbargains.co.uk

Order On-Line at www.computerbargains.co.uk

SAME DAY SHIPPING. FREE TECHNICAL SUPPORT. NO CREDIT CARD SURCHARGE. ALL GOODS BRAND NEW WITH WARRANTY. TRADE PRICES

PRICES. NO CREDIT CARD SURCHARGE. FREE TECHNICAL SUPPORT



FAMOUS BRAND
PIII-700MHz 14.1" DVD NOTEBOOK
£699 ~~£821.33~~
+VAT inc VAT

- Intel Pentium III- 700MHz. Processor
- 128MB Ram exp to 512MB
- 20GB Hard Drive
- Built in DVD ROM Drive & 3 1/2" Floppy
- 14.1" 1024 x 768 TFT Colour Screen
- 2 xPCMCIA, Serial, USB, Parallel, VGA & Includes Internal 56K Fax/Modem
- Supplied with Microsoft Windows ME & Works Software
- Includes Battery & AC Adapter
- Factory Clearance/Refurb stock with 1 year warranty.

OPTIONS Ex.VAT Inc.VAT

Upgrade to 256MB Ram	£40	£47.00
Notebook Carry Case add	£20	£23.50
Optional PCMCIA Network Card	£30	£35.25

USI LCD PC
933MHz 15.1" TFT LCD PC
£699 ~~£821.33~~
+VAT inc VAT

This LCD PC is a fully integrated system that is supported by many powerful features, including a small thin and space saving design.

- Intel Pentium III-933MHz Processor
- 128MB SDRAM expandable to 512MB
- 30GB IDE Hard Drive
- Built In 3 1/2" Floppy Drive & DVD ROM Drive
- XGA 15" TFT Colour Screen with 1024 x 768
- On board AC97 Sound System with Twin Speakers
- Serial, Parallel, VGA, PCMCIA & USB Ports
- Supplied with PS2 Style Keyboard & Mouse
- Windows 98 Operating System add £55+VAT (£64.63inc)



933MHz PROCESSING POWER

FUJITSU-SIEMENS
WIDESCREEN DVD NOTEBOOK
£679 ~~£797.83~~
+VAT inc VAT

- Fujitsu Lifebook P2020
- Crusoe 633MHz CPU
- 128MB RAM, 15GB Hard Drive
- Integrated DVD-ROM Drive
- 10" Widescreen 1280 x 600 TFT Colour
- Built in sound system with Stereo Sound
- PCMCIA, USB, Firewire & S-Video Ports
- UK Keyboard with Trackpoint, Built in 56K Fax/Modem
- Includes Microsoft Windows ME, Works & Word 2000 Software Pre-installed and supplied with recovery CD
- Complete with Li-Ion Battery & AC Adapter
- Dimensions 264 x 183 x 32mm. Weight 1.5Kg.
- New & Boxed with 1 Year manufacturers warranty
- Optional USB 3.5" Floppy Drive add £39+VAT (£45.99)



THIS MONTHS SPECIAL OFFER



FAMOUS BRAND
850MHz DVD + CDRW PC
£365 ~~£428.83~~
+VAT inc VAT

- Famous Brand Name PC Consisting of:-
- Intel Celeron 850MHz. CPU. 128MB Ram exp to 512MB
 - 20GB Hard Drive, DVD + CD-RW Combo Drive
 - 3 1/2" Floppy Drive, Sigma Tel STAC9700 On Board Audio
 - Intel 810 2x AGP Graphics
 - 56K Modem, Serial, Parallel, USB and Games/Midi Port
 - Keyboard & Mouse, Windows ME Software Pre-installed
 - Factory Clearance/Refurbished and supplied with 1 year On-Site Warranty. Supplied without monitor see below.

OPTIONS Ex.VAT Inc.VAT

Matching 17" Colour Monitor	£100	£117.50
Matching 15" TFT Flat Screen	£225	£264.38

CTX
EzBook 700 400MHz NOTEBOOK
£499 ~~£586.33~~
+VAT inc VAT

- AMD K6 2-400MHz.CPU
- 512K Pipeline Burst Cache
- Supplied with 128MB Ram
- 10GB Hard Disk Upgradeable
- 12.1" 800 x 600 TFT Colour Screen
- 3 1/2" Floppy Drive, 24x CD ROM Drive
- 2x PCMCIA, Ser. Par. VGA, PS2 & USB Ports
- Built in Sound System with Speakers, & Midi Port
- Includes Battery and AC Adapter
- New & Boxed with 12 Months Warranty

NOTEBOOK OPTIONS Ex.VAT Inc.VAT

Optional 56K Fax/Modem	£35	£41.13
Windows 98 Software	£60	£70.50
Deluxe CTX Notebook Carry Case	£20	£23.50



GREAT SPEC NOTEBOOK

FAMOUS BRAND
P4 - 1.5GHz DVD+CDRW PC
£485 ~~£569.88~~
+VAT inc VAT

- Intel Pentium 4 1.5GHz
- 256MB Ram expandable
- 40GB Hard Drive, 3 1/2" Floppy Drive
- Includes separate DVD + CD-RW Drives
- GeForce 2 MX-400 64MB Graphics and built in
- 56K Modem, Serial, Parallel, USB and Games/Midi Port
- Keyboard & Mouse, Ms Windows XP & Works Software
- Factory Clearance/Refurbished and supplied with 1 year On-Site Warranty. Supplied without monitor see below.

OPTIONS Ex.VAT Inc.VAT

Matching 17" Colour Monitor	£100	£117.50
Matching 15" TFT Flat Screen	£225	£264.38



ORDER NOW FOR NEXT DAY DELIVERY



IBM
THINKPAD 600 DVD NOTEBOOK
£475 ~~£558.13~~
+VAT inc VAT

- Intel Pentium III-366MHz CPU
- 128MB Ram, 6GB Hard Drive
- DVD ROM Drive, Floppy Drive & Sound System
- 13.3" 1024 x 768 Colour Screen
- Internal Modem, PCMCIA Slots, Serial, Parallel
- Complete with Li-Ion Battery & AC Adapter
- Ex-Corporate & Refurbished with 6 months warranty
- Supplied with Driver CD. Excludes Operating System

13.3" TFT MODEM & DVD

DELL
LATITUDE LS SUB-NOTEBOOK
£849 ~~£997.58~~
+VAT inc VAT

- Dell Latitude L400 with Intel Pentium III-700MHz CPU
- 128MB RAM, 10GB HDD, 12.1" 1024x768 TFT Colour Display
- PCMCIA, Parallel & USB Ports, Built in Network & Modem
- Supplied with External CD ROM & Floppy Drive
- Includes Battery, Charger & Windows 98 Software Pre-installed.
- Weighs only 3.5lbs, Dimensions 270 x 218 x 25mm
- Dell factory clearance stock & supplied with 1 year warranty



COMPAQ
13.3" TFT NOTEBOOK
£399 ~~£468.83~~
+VAT inc VAT

- Compaq Armada 7400 Notebook
- Intel Pentium III-300MHz CPU
- 128MB RAM exp 256MB, 6GB Hard Drive
- Supplied with Internal CD ROM, 3 1/2" Floppy Drive
- 13.3" 1024 x 768 Resolution TFT Colour Display
- Li-Ion Battery, AC Adapter & Carry Case
- Ex-Corporate & refurbished with 6 months warranty
- 56K PCMCIA Fax/Modem add £30+VAT (£35.25inc)



13.3" TFT 128MB RAM 6GB HDD



PORTABLE CD ROM DRIVES
Parallel £59 +VAT
£69.33 inc VAT
PCMCIA £75 +VAT
£88.13 inc VAT



FAMOUS MAKE
733MHz PC
From Only **£295** +VAT
£346.63 inc VAT

- eMachine Model No. eTower 733i
- Intel Celeron 733MHz CPU
- 128MB SDRAM expandable
- 20GB Hard Drive & 3.5" Floppy Drive
- 48x Speed CD ROM Drive
- Internal Soundcard & 56K V90 Modem
- PS2 Style Keyboard, Mouse & Speakers
- Software includes MS Windows Millennium & MS Works
- Excludes monitor. Monitors available separately
- Brand New with 12 Months Warranty.

OPTIONS Ex.VAT Inc.VAT

15" SVGA Colour Monitor Refurb	£55	£64.63
15" SVGA Colour Monitor New	£75	£88.13
17" SVGA Colour Monitor Refurb	£75	£88.13
17" SVGA Colour Monitor New	£105	£123.38
Upgrade to 256MB Ram	£30	£35.25

AVAILABLE FOR NEXT DAY DELIVERY

IOMEGA
USB CD-REWRITER
£85 ~~£99.88~~
+VAT inc VAT



External USB CD-RW. Plugs directly into USB port on laptop or desktop PC. Supplied with cable, PSU & Driver CD-RW Software required

TOSHIBA
13.3" TFT NOTEBOOK
£349 ~~£410.08~~
+VAT inc VAT



Toshiba Tecra 550CDT Intel Pentium 266MHz 64MB Ram 4GB Hard Drive 13.3" TFT Screen Modem CD ROM FDD. Refurb with 6 months warranty

SPECIAL OFFERS Ex. VAT Inc. VAT

56K V90 PCMCIA or USB Fax/Modem	£45	£52.88
3 Com. 10 Base PCMCIA Network Card	£30	£35.25
10/100 Base PCMCIA Network Card	£40	£47.00
Xireom PCMCIA Modem & Network Card	£65	£76.38
Ext PCMCIA or USB 2 1/2" Hard Drive Case	£39	£45.93
Ext PCMCIA or USB 3 1/2" Hard Drive Case	£49	£57.58
2 1/2" 10GB Notebook Hard Drive	£85	£99.88
Universal Notebook Car Adapter	£45	£52.88
Laptop Batteries & Memory Upgrades	£Call!	£Call!
Smartmedia & CompactFlash Memory	£Call!	£Call!
Xerox DocuPrint M750 Colour Printer	£65	£76.38

OLYMPUS DIGITAL CAMERAS From Only £99 +VAT £116.33 inc VAT

Large stocks of various Olympus Digital Cameras.

Olympus C100 Digital Camera	£99+VAT (£116.33)
Ultra Compact 1.3 Mega Pixel, 2x Digital Zoom, Smartmedia, USB	
Olympus C1 Zoom Digital Camera	£149+VAT (£175.08)
Ultra Compact 1.3 Mega Pixel 3x Optical Zoom (38-114mm), USB	
Olympus Camera C-2000Z Digital Camera	£175+VAT (£205.63)
Compact 2.1 Mega Pixel, 3x Optical Zoom (36-110mm), f2.0 aperture	
All cameras factory refurb stock with 1 year Olympus warranty	

COMPUTER BARGAINS

215 BURY OLD ROAD. PRESTWICH, MANCHESTER. M25 1JF.

Mail Order **0870 757 2216** General Enquiries Call: **0161 798 5588**
Sales Call: **0870 757 2216** Fax No: **0161 757 2219**

Email: sales@computerbargains.co.uk ALL MAJOR CREDIT CARDS, GOVERNMENT & EDUCATIONAL ORDERS ACCEPTED

CALLERS WELCOME TO OUR SHOWROOM
PLEASE PHONE TO CONFIRM AVAILABILITY
OPENING TIMES
MON-FRI 9am-6pm SAT 9am-12pm
or visit our website at
www.computerbargains.co.uk



All Trademarks Acknowledged. E & OE

Barcode Hardware and Software

pcbarcode.co.uk

Portable Readers



- 512K unit with wand
- Scan and key data to memory
- Battery operated (3 AAs)
- Upload collected data to host computer - serial, keyboard or USB
- 2 built-in inventory programmes
- Patented voice prompts
- Easy to create custom prompts and custom voice messages
- Cord attached Wand, Laser or CCD
- Very small - long battery life

- 512K built-in laser model
- Laser scanner built into top
- One-hand scanning
- Right hand or left hand
- Eliminates cord and separate scanner
- Very rugged and lightweight
- Lifetime warranty on scan element
- Weighs 418 g. with 3 AA batteries
- 80,000 scans per set of batteries
- Custom voice messages
- Keyboard or serial uploading



Bar Code Labelling Software

- Any format, any label. WYSIWYG
- Formats for Odette
- Code 128, UPC/EAN, 2 of 5, Codabar, Code 39, PDF417
- Lines, boxes, rotations, colour, PCX, BMP, etc.
- Simple custom operator interface
- Prints to LaserJet, DeskJet, etc.



Keyboard Laser Reader



- Keyboard decoder built-in
- No extra box
- For PC and Mac
- Two-year warranty
- Code 39, Codabar, Interleaved 2 of 5, UPC/EAN, Code 128, Code 93, Codabar, etc.

Keyboard Wedge Wand

- Attaches as second keyboard or USB!
- No software needed
- For Windows, DOS, & Mac
- Code 39, UPC/EAN, 128, 2 of 5, 93, Codabar, etc.
- Wand, Laser, CCD, Slot Badge and Magstripe



Don't buy new readers just for USB interface!

With the Wedge Saver™, any manufacturer's wedge reader can be attached to a PC or Mac USB port. The Wedge Saver™ can convert any 5 pin or 6 pin mini-dIn connection reader to a USB reader in seconds!



Bar Code Fonts for Windows

- Insert TrueType or Postscript bar codes into any font-based Windows programme
- Prints Code 39, UPC/EAN, Code 128, Codabar and Interleaved 2 of 5
- Hotkey desktop translation or DLL for programmers



RF Terminals



- Scan and key data on-line with portable wireless terminal
- Computer sends instructions to display & trigger voice messages
- Lowest cost in industry
- Most powerful - 200,000 m²
- Smallest size & lowest weight
- Industry's simplest to implement
- No terminal programming - only host programmes in VB, Access, C, Delphi, GWBasic, etc.
- RA approved - license free
- Up to 16 terminals per base
- 9 user selectable frequencies

- Built-in laser model
- Laser scanner built into top of the RF Terminal
- Easy one-handed scanning
- Comes with shock absorbing rubber boot and wrist strap
- RA approved - license free



RF Scanners

- Cordless scanning
- Up to 33 metres
- RF Wand, CCD and Laser
- Laser with confirming beeper
- Base attaches as a second keyboard on PC or Mac
- Serial attachment also available
- RA approved - license free



Bar Code Printer and Software

- Citizen industrial-quality Thermal transfer printer for bar code labels
- Includes Windows label design software, cable, labels and ribbon
- Up to 10 cm label width
- Desktop model available



Call Our FreeFone 0800 393 213

Broadest Selection of PC Bar Code Products in the Industry

Buying from the Manufacturer Means:

- Better pre-sale support
- Better technical support
- 24-hour turnaround on repairs
- Immediate assistance
- Technically superior products
- All products in stock
- Made and designed in the USA
- 0800 technical support
- Same day express shipping
- 2-year warranty on readers
- 30-day money back guarantee

or visit our website
pcbarcode.co.uk/w
for a complete catalogue and
bar code primer

CALL FOR FREE
CATALOGUE AND
BAR CODE
PRIMER!

Europe Phone: +353 1 6614 566 • Fax: +353 1 6614 622

now you can shop online!
pcbarcode.co.uk/w



CD-R Media.co.uk

UK's Leading Media Specialist

All Prices Include Vat



NO Credit / Debit Card Surcharge

CD-R 74min Jewel Cased 10-90 100-290 300-590 600-990 1000-2000

TDK Reflex 40p 39p 38p 37p 36p

CD-R 80min Jewel Cased

Verbatim DataLifePlus 42p 41p 40p 39p 38p

TDK Reflex 48p 47p 46p 45p 44p

Paradox 36p 35p 34p 33p 32p

Intenso 37p 36p 35p 34p 33p

Zero Defex 39p 38p 37p 36p 35p

Memorex 42p 41p 40p 39p 38p

Traxdata 35p 34p 33p 32p 31p

CD-R 80min Audio

Verbatim MusicLifePlus 67p 66p 64p 62p 60p

CD-R 80min Spindle 25-75 100-275 300-575 600-975 1000-2000

Paradox 27p 26p 25p 24p 23p

Zero Defex 30p 29p 28p 27p 26p

Intenso 27p 26p 25p 24p 23p

Traxdata 28p 27p 26p 25p 24p

Memorex 30p 29p 28p 27p 26p

Unbranded - 22p 22p 21p 21p

Diamond Silver 33p 32p 31p 30p 29p

Diamond Black 33p 32p 31p 30p 29p

CD-R 90min+ Spindle

Intenso 35p 34p 33p 32p 31p

DVD-R 4.7gb

Verbatim 1-5 6-10 11-20 21-50 51-200

£5.25 £5.20 £5.15 £5.10 £5.00

Intenso £3.75 £3.70 £3.65 £3.60 £3.50

Paradox £3.00 £2.95 £2.90 £2.85 £2.75

Unbranded £2.75 £2.70 £2.65 £2.60 £2.50

CD-RW Jewel Cased

1-49 50-99 100-299 300-1000

Verbatim 74min 1x-4x 99p 94p 88p 76p

Verbatim 80min 1x-4x £1.05 99p 94p 82p

Verbatim 74min 4x-10x £1.40 £1.35 £1.30 £1.17

Verbatim MusicLifePlus £1.39 £1.32 £1.27 £1.15

CD Storage

10-100 110-590 600-990 1000-2000

Jewel Cases 14p 13p 12p 11p

Slim-Line Jewel Cases 13p 12p 11p 10p

Double Jewel Cases 17p 16p 15p 14p

Quad Jewel Cases 33p 32p 31p 30p

DVD Cases 18p 17p 16p 15p

Double DVD Cases 29p 28p 27p 26p

Plastic Wallets 5p 5p 4p 4p

Cardboard Sleeves 6p 6p 6p 5p

Paper Sleeves 5p 5p 4p 4p

Also available:- CD Labels, CD-R Pens, CD Printers, Ink Cartridges, MiniDisc, CD-R Business Cards, CD Replication, CD-R Duplication, CD-R Silk Screen Printing

Established Since 1984

CD R Media.co.uk is a subsidiary of FocusMove.com

Lower prices available for higher quantities.
Open for sales & enquires Mon-Fri 9am to 6pm

All trademarks acknowledged.
Prices correct at time of going to press. E & OE

Sales : 01799 543 606

www.cd-rmedia.co.uk

CD-R Business Card Starter Kit



Unbranded 80min



240 Carry Case



Jewel Cases



Ink Cartridges



mr memory is No.1 when it comes to £price

- ✓ we are now in our 9th year successfully providing upgrade solutions
- ✓ 40,000+ specific memory upgrade solutions
- ✓ our memory upgrades are 100% pre-tested and carry a lifetime warranty
- ✓ next day delivery service anywhere in mainland UK
- ✓ all major credit and debit cards accepted
- ✓ specific memory solutions for all systems
- ✓ 30 Pin / 72 Pin SIMMs
- ✓ PC133 / PC100 / PC66 168 Pin SDRAM
- ✓ PC133 / PC100 / PC66 144 Pin SO DIMMs
- ✓ DDR / RAMBUS

Kingston
TECHNOLOGY



avoid disappointment,
call today for a price!

01483 727 333
mrmemory.co.uk



Mr Memory

COMPAQ DELL ELONEX FUJITSU GATEWAY HP IBM MESH
OLIVETTI PACKARD BELL SONY VAIO TOSHIBA TIME TINY

CD Duplication

- Credit Card Size
- 80 mm Mini CDs
- Standard 120 mm CDs

Mastering
Copying
Packaging

Full Colour Labelling
Distribution
Any Quantity

Competitive prices please call for quote



High Quality Service
Fast Delivery
No Quibble Guarantee

Floppy Disks

PC or Mac



Web Site Design

Consultancy
e-Commerce
Search Engine Submission

Web Page Design
Hosting

Tel/fax 0870 900 0016

194 Red Lion Road, Surbiton KT6 7RA

Info@friendlymouse.com



www.friendlymouse.com^{pany} ltd

www.inkandstuff.co.uk
Lowest Prices Ever!

Consumables Just Got Cheaper!

... and the service got even better!

FREE 1st CLASS DELIVERY

All Prices include VAT • Everything 100% Guaranteed



Compatible & Remanufactured Cartridges
100's to choose from – all sorts of super value
packs and special offers.

NEW Compatibles for Epson C70 / C80 printers.



Original InkJet & Laser Cartridges
Wide selection from Canon, Epson, HP, Xerox,
Olivetti, Lexmark, Brother etc.



Software • Discs • CD's • Papers • Mice
Everything you need to enjoy using your
computer.



CompactFlash & SmartMedia • Zip Drives
Lithium Batteries • Office Furniture



Please order on-line from an established British Company

www.inkandstuff.co.uk

Inkandstuff • Station Square • Dornoch • Sutherland • IV25 3PG
Personal callers welcome

MicroMart

PROVIDING TOP QUALITY PRODUCTS AT BARGAIN BASEMENT PRICES SINCE 1991
ALL PRODUCTS ADVERTISED ARE NORMALLY AVAILABLE FOR SAME DAY DESPATCH

IBM THINKPAD i1200 CD

IBM THINKPAD i1200

Intel Celeron 550MHz processor
96mb ram, 5gb hd
24x CD ROM drive, sound system
12.1" HPA screen
US keyboard layout, trackpoint pointing device
56k modem
Serial, parallel, 2x USB, VGA, PS2 ports
2x Type II Cardbus PCMCIA slots
Battery & AC adaptor / charger
Weight approx. 2.7kg, dims 313 x 252 x 36 mm
New & boxed with 1-year IBM warranty
Includes Win ME & Lotus SmartSuite with recovery disks
Printed manual foreign, on-line documentation in English
No fdd included, add only £39.99 + vat for external USB drive



IBM THINKPAD i1200 DVD

IBM THINKPAD i1200

Intel Celeron 600MHz processor
64mb ram, 10gb hd
DVD ROM drive, sound system
12.1" TFT screen
US keyboard layout, trackpoint pointing device
56k modem
Serial, parallel, 2x USB, VGA, PS2 ports
2x Type II Cardbus PCMCIA slots
Battery & AC adaptor / charger
Weight approx. 2.7kg, dims 313 x 252 x 36 mm
New & boxed with 1-year IBM warranty
Includes Win ME & Lotus SmartSuite with recovery disks
No fdd included, add only £39.99 + vat for external USB drive



FAMOUS NAME DVD

FAMOUS NAME 1GHz NOTEBOOK COMPUTER

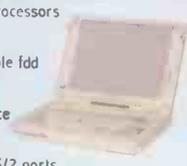
Model 7521N (Easy One Silver)
Intel Celeron 1GHz processor
256mb ram, 20gb hd
Integral fdd & DVD rom drives, sound
UK keyboard, Touchpad pointing device
56k modem, 14.1" TFT screen
2x PCMCIA slot, Serial and parallel ports
2x USB ports, 2x PS/2 ports, IR port
Li-ion battery & AC adaptor/charger
Windows XP Home Edition & Works 2000
Refurbished as new and boxed
Complete with restore CDs and manual
1-year manufacturer's warranty



COMPAQ LTE CD

COMPAQ LTE NOTEBOOKS WITH CD-ROM

Intel Pentium 120MHz processors
32mb ram
1.3gb hard disk
Integral CD and swappable fdd
TFT colour screen
UK keyboard
Trackpoint pointing device
Built-in sound
2x Type II PCMCIA slots
VGA, serial, parallel & PS/2 ports
2nd-user, 90-days RTB warranty
n.b. battery life very limited



LTE5250 £169.99
10.4" screen £199.74
LTE5280 £179.99
11.3" screen £211.49

COMPAQ ARMADA 7400

COMPAQ ARMADA 7400 NOTEBOOK COMPUTER

Intel Pentium II 300MHz processor
64mb ram, 6.4gb hd
24x internal cd-rom
Swappable 3.5" fdd
13.3" TFT screen
US keyboard layout
Trackpoint pointing device
2x Type II PCMCIA slots
USB & Infra-Red ports
Serial, Parallel & PS/2 ports
Li-ion battery
AC adaptor/charger
2nd-user, 90-days RTB warranty
These have minor cosmetic damage in the hinge covers area, hence £50+vat reduction. Has no effect structurally.



£329.99 £387.74

COMPAQ ARMADA TFT SPECIAL

COMPAQ ARMADA 7730 NOTEBOOK COMPUTER

Intel Pentium 166MHz MMX processor
80mb ram
2gb hard disk
Integral 3.5" fdd
12.1" TFT screen
56k internal modem
US keyboard layout
Trackpoint pointing device
2x Type II PCMCIA slots
Infra-Red, Serial, Parallel & PS/2 ports
Li-ion battery & Integral AC adaptor/charger
2nd-user, 90-days RTB warranty
Special offer with portable cd rom only £249.99 + vat = £293.74



Please see website for other models and configurations

£199.99 £234.99

MODEMS

PG internal 56k V90 for desktops £19.99 £23.49
External serial 56k V90 £34.99 £41.11
External USB 56k V90 £34.99 £41.11
External USB 56k V90 Win 98 only £14.99 £17.61
Notebook PCMCIA modems
56k V90, new, full retail box £32.99 £38.76
Combined 56k modem & 10/100 network card on Cardbus PCMCIA card £49.99 £58.74
3Com Combo Type II card, 33K6 & 10BaseT (RJ45), 2nd user, 90-day warranty £19.99 £23.49

IOMEGA CD-RW

IOMEGA PORTABLE CD-RW DRIVE

Suitable for notebook or desktop computers
4x46 external unit
USB interface
Includes cables & psu
OEM product, plain box
Requires P166, USB, Win 98+
1-year RTB warranty



£79.99 £93.99

NOTEBOOK ACCESSORIES

Second-user notebook carry cases, standard type £9.99 £11.74
Second-user notebook carry cases, lots of pockets £14.99 £17.61
150W inverter, run notebook and printer from your car £49.99 £58.74
PCMCIA SCSI host adaptor with SCSI 1 cable and connector £39.99 £46.99
Cardbus PCMCIA card with 2x USB ports (note: 3V cardbus card) £39.99 £46.99
PCMCIA dual Ethernet card with BNC and RJ45 connections £29.99 £35.24
PCMCIA 10/100 Ethernet card (note: 3V cardbus card) £29.99 £35.24
Xircom 10/100 & 56k modem combo on Cardbus PCMCIA card £49.99 £58.74
56K V90 PCMCIA fax/data modem complete with software etc. £32.99 £38.76
Trust Familycam 200 digital camera. Up to 320 photos, up to 640x480. USB £39.99 £46.99
4050mAh Li-ion battery for Compaq Armada 6500. Also suits Digital Hi-note Ultra £49.99 £58.74
Portable 24x CD-ROM, USB or PCMCIA (specify when ordering) £74.99 £88.11
External case for 2.5" notebook hard disk drives, PCMCIA or USB (specify) £39.99 £46.99
External case for 3.5" drives or other ATAPI devices. PCMCIA interface only £39.99 £46.99
External case for 3.5" drives or other ATAPI devices. USB interface £49.99 £58.74
Ext. case for 5.25" drives (HD/CD/CDRW/DVD etc). USB, Mains pwrd £49.99 £58.74
External 3.5" 1.44mb floppy drive. USB interface. Also suitable for desktops £39.99 £46.99

CANON S400 BUBBLEJET PRINTER

CANON S400 COLOUR INKJET PRINTER

Up to 9 ppm black, 4 ppm colour
Up to 1440 x 720dpi
Parallel & USB interfaces (cables NOT supplied)
Windows 95/98/ME/2000/NT4 compatible via parallel i/f
Windows 98/2000/ME and MAC compatible via USB i/f
Dimensions: 418 x 306 x 169mm, approx. 3.7kg
New, with 1-year manufacturer's warranty



£59.99 £70.49

EXTERNAL 8GB PCMCIA HD

IBM Travelstar 8E external, PCMCIA, portable 8GB hard disk drive. Slot-powered, this drive is only 28.0 x 108.0 x 171.5 mm and weighs just 340g.

£99.99 £117.49

MINI TOWER DVD SPECIAL

FAMOUS NAME MINITOWER

AMD Duron 850MHz processor
128mb ram, 20gb hard disk
DVD rom drive, 3.5" 1.44mb fdd
Spare 5.25" drive bay
Soundcard & speakers
56k modem
10/100 network card
2x USB ports, 2x PS/2 ports
Serial, parallel, VGA & games ports
Mouse and UK keyboard
Pre-loaded with Windows ME

£299.99

£352.49

Complete with manuals, restore CDs and DVD software.
Factory refurbished as new.
1-year Warranty

H-P LASERJET 4 & 4+

Complete with cartridge (toner qty not guaranteed). 2nd-user, 90-days RTB warranty.

L/jet 4, 8ppm £69.99 £82.24

L/jet 4+, 12ppm £84.99 £99.86

40MB POCKET ZIP

IOMEGA Pocket Zip PCMCIA disk drive. Fits standard Type II slot to enable you to back up 40mb of data on to removable disk. Complete with drivers, 1x 40mb Pocket Zip disk and carry case.
New. 1-year RTB warranty



£39.99 £46.99

DESKTOP & MONITOR CLEARANCE

All second-user, 90-day RTB warranty unless otherwise stated

	ex-vat	inc-vat
Dell Optiplex PII 400MHz, 64mb ram, 6gb hd, cd-rom, soundcard	£159.99	£187.99
Compaq Deskpro PII 350MHz, 64mb ram, 6.4gb hd, soundcard, USB, n/work card, small footprint case, ideal network workstation. No spare bays for cd-rom	£89.99	£105.74
P166MHz, 32mb ram, 1gb hd, 3.5" fdd desktop	£39.99	£46.99
Packard Bell A726 17" monitor, 15.7" viewable area, .27 dp, factory refurb, 1-year warranty	£79.99	£93.99
17" SVGA monitor, 15.9" viewable area, .28 dot pitch, up to 1280x1024 resolution. 2nd-user, 90 days RTB warranty	£69.99	£82.24
15" SVGA monitor, second-user, 90 day RTB warranty	£49.99	£58.74

ORDER ON-LINE FROM

SterlingXS

www.sterlingxs.co.uk

WEBSITE UPDATED DAILY!

Sterling Management Systems Ltd
13-15 Barrack Road, Guildford
Surrey, GU2 9ZW

e-mail: - sales@sterlingxs.co.uk

Tel: 01483 301331

Fax: 01483 533079

ORDER ON-LINE FROM

SterlingXS

www.sterlingxs.co.uk

Prices exclude delivery at Initial City Link standard rates by weight. Goods have a 1-year RTB warranty unless otherwise stated. Credit card payments are subject to a 2.5% surcharge, no surcharge for Switch, Delta or Solo. All trademarks acknowledged. Stocks are finite - telephone before travelling to confirm availability. Photos for illustration only. E&OE.

CATS www.rapidresults.co.uk

CLASSROOM COURSES OFFERING 'HANDS ON' LEARNING

- **PC ASSEMBLY - 1 DAY COURSE - Banbury and London - £69:00**
 Learn to build and upgrade a modern PC. For absolute beginners. At the end of this course you will leave with the confidence to assemble a computer or upgrade an existing one. Check our web site to see exactly what is included on this popular course. Build, upgrade, configure etc etc etc. **One Day Course £69:00** (London £10 extra).
- **PC TECHNICIAN'S - HALF DAY COURSE - Banbury - £59**
 A ½ Day practical 'hands on' course aimed at the PC Assembler who wants a more than adequate knowledge of repairing computers. Small groups assure individual attention. You will learn how to repair operating system registry, including Windows 95, Windows 98, Windows NT4, Windows ME, Windows 2000 Professional. You will be able to restore an operating system in minutes!!! Check our web site to see what else is included. **Half Day Course £59:00**
- **A PLUS (A+) - 5 DAY COURSE - Banbury - £699:00**
 A+ Certification is one of the most sought after certification courses in the computer industry. We assist you in getting the valuable skills, knowledge and technical recognition that will open the door to better career opportunities. **A concentrated 5 day, practical 'hands on' classroom course only £699:00**
- **DREAMWEAVER - 1 DAY COURSE - Banbury with 1-2-1 Tuition - £125:00**
 Learn to design 'state of the art' web sites. This course is intended for the absolute beginner where you will learn how to use Dreamweaver 4 and also use Fireworks 4. The 1-2-1 offer is for a limited period only. Check out our web site.

HOME STUDY COURSES - VIDEO & CD ROM

- **PC ASSEMBLY VIDEO - 4 HOURS - £39:00**
 Everything about building a PC. Explained in minute detail for the absolute beginner. Components identified and explained. The system build, configuring, loading of operating system, sound - modem and graphics configured. Laptops, SCSI, Firewire and Troubleshooting included. Pentium 4, AMD Duron (socket A), Pentium 3 and Socket 370 included. Includes a FREE ASSEMBLY Instruction Booklet. **Video and Assembly Instruction Booklet only £39:00**
- **ADVANCED PC ASSEMBLY VIDEO - £39:00**
 Featuring Pentium 111 with DVD and CD Re-Writer. More time explaining the CMOS and partitioning. Devices configured, and an Introduction to basic networking. Making new communication ports. **Only £39:00**
- **A+ Certification - 2001 Syllabus - £299:00**
 12½ hours Video Instruction with Certified Instructor Dave Abel. 922 Page Study Guide included. Interactive CD Rom with adaptive test engine. This A+ Certification programme will give you all the knowledge necessary to master the A+ Exams.
A+ Certification on Video - £299:00 (special offer - £175 for limited period)
- **NETWORKING. An Introduction on Video. £39:00**
 Featuring Dave Abel who explains networking terminologies, NIC cards, Cables and Connections and setting up a network. Sharing a printer, Internet Connection and more. **Only £39:00**
- **NETWORK+ Certification**
 5 CD Roms, Practice Exam Simulator and a Study Guide
NEW 2002 SYLLABUS - Network PLUS - £299
- **CISCO £399:00**
 6 Interactive CD Roms or 5 Videotapes, a Cisco CCNA Study Guide CCNA Virtual Lab e-trainer, and a Quick Cert Practice Exam Simulator on CD Rom. **Only £399:00**
- **MCSE 2000 TRACK.**
 8 Microsoft courses covered. 24 Interactive CD Roms (or Videos)
 8 Microsoft Study Guides, 8 QuickCert Practice Exam Cds,
RRP £1749 - only £1195

ORDER BY CHEQUE / POSTAL ORDER OR ANY MAJOR CREDIT CARD



We have come to an arrangement with International Internet vendors Cardquery to take secure credit card orders online.

Orders with Cheque / Postal Order ..

To CATS, 23a Cornhill, Market Place, Banbury, Oxfordshire, OX16 5NG

Please send me the following courses:
 Prices include postage, packing and VAT - please allow 7 days for delivery

- Please rush me your FREE Info' Pack
- Please send the items listed below:-

Name:

Address:

Post Code Tel.No:

CATS

Tel / Fax: 01295 26 44 99

All fees include V.A.T. @ 17.5%

Check out our website for course dates and availability

www.rapidresults.co.uk

Email: admin@rapidresults.co.uk

SOPHISTICATED MOBILE DATA SOLUTIONS FROM ONLY £950

- WAREHOUSE RECEIVING
- STOCK MOVEMENT
- ORDER PICKING
- DESPATCH & LOADING
- RETAIL STOCK COUNT
- PRICE CHECKING
- ASSET TRACKING
- SECURITY MONITORING
- METER READING

These are just some of the included applications. TAAPS designer allows comprehensive customising and development from scratch. No programming skills are required.



Paradigm's TAAPS-Dolphin mobile data kit comprises a rugged Hand Held Products Dolphin 7200 laser scanning terminal with charging and data comms cradle, TAAPS application designer (PC) and 20+ starter programs for retail, warehousing and facilities management. Normal list price for this kit is £1310+VAT but, for a limited period, you may purchase it for only £950+VAT. Many other terminals and solutions available, plus bar code products - please call!



Visit our website for product guides, case studies and software downloads. Call for free copies of *Capture IT* case studies booklet and Paradigm guide to bar codes.



01235 750602 www.paratech.co.uk

Paradigm Technology Limited Paradigm House Basil Hill Road Didcot Oxfordshire OX11 7HJ

printcartridge.net
0800-7836286

We are a Which? Web Trader
Price includes VAT and delivery
No Minimum Order
No Credit Card Surcharges
Money Back Guarantee
Secure Website
(128 bit encryption) E&OE



EPSON ORIGINAL CARTRIDGES

Black	SO20093/20187/T007401	£14.99
Colour	SO20089/20191	£16.99
Black	SO20108/20189	£15.79
Colour	Photo SO20110/20193	£12.99
Black	Stylus C20/C40 TO13401	£10.99
Colour	Stylus C20/C40 TO14401	£16.99
Black	Stylus 680 TO17401	£19.49
Colour	Stylus 680 TO18401	£16.99
Black	Stylus 880 TO19401	£19.99
Colour	Stylus 880 TO20401	£16.99
Black	Stylus C60 TO28401	£21.99
Colour	Stylus C60 TO29401	£19.99
Black	Stylus C70/C80 TO32140	£23.99
Colour	Stylus C70/C80 TO322/323/324	£9.99
Black	Photo 810 TO26401	£18.99
Colour	Photo 810 TO27401	£15.39

Buy 1 Get 1 Free!

On all the compatible Epson, Canon and Xerox cartridges listed below!!

EPSON COMPATIBLES:

Black Compatibles for:

400/440/460/480/500/580/600/640/660/C20/C40	
670/Photo/700/740/750/760/800/860/880/900/	
1160/1200/1520/2000/2500/EX	ONLY £4.69
Pro/XL+III/IIIs/200/820	ONLY £4.99

Colour Compatibles for:

300/400/440/460/480/500/580/600/640/660/	
700/740/750/760/800/860/880/900/980/	
1520/EX/C20/C40	ONLY £7.59
PRO/XL/II/200/820/1200/1500	ONLY £7.99

CANON COMPATIBLES

	Black	Colour
BJC 2000/4000/5000 Series	£2.98	£4.99
BJC 600 Series	£2.98	£2.98
BJC 3000/6000/6500/S400/S450/S4500/S600/S630	£4.99	£4.99

XEROX COMPATIBLES

	Black	Colour
XJ4C/XJ6C/450C	£4.99	£4.99
C6/C8	£4.99	£4.99
M750/760/940/950 - Hi Yield Black	£8.99	£5.99

LEXMARK Call for prices on original & remanufactured cartridges

Epson compatibles: (not Buy 1 get 1 Free!)

	Black	Colour
680	£6.99	£7.99
790/870/890/	£7.49	£7.49
1270/1290		
C60-NEW	£7.49	£7.49
Photo 810-NEW	£7.99	£7.99



	Original	Reman
51626A	£22.99	£11.99
51625A	£23.49	£13.99
51629A	£21.99	£11.99
51645A	£21.99	£9.99
C6614A	£19.99	£12.99
51649A	£22.99	£14.89
C6615D	£19.99	£11.99
C6625A	£20.99	£16.99
C6578D	£24.99	£16.99



Unit 6, Cypress Court
Harris Way
Sunbury-on-Thames
Middlesex
TW16 7EL

Red hot printer cartridge quality & value...

Compatible cartridges and media for Epson and Hewlett Packard printers

Top quality Compatible Epson Cartridges

Stylus/Color/200	Matched pair	£5.75
S Col 400/600/800/1520	2 pairs	£10.95
S Col 440/460/640/660/670/740/760/860/1160	4 pairs	£19.75
Stylus Scan 2000 & 2500	10 pairs	£45.95
Stylus Color 480/580	Single Black	£2.25
S Col 900/S Photo 1200/750	Single Colour	£3.95
Stylus 500/Photo	5 black	£10.95
Photo 700/EX	5 colour	£18.95
Stylus 820/Color II/III/S/1500		
Stylus Color/Pro/Pro XL		
Stylus Color 880/C20/C40		



Compatible Epson 'Chipped' Cartridges

Stylus Color 680	Matched pair	£14.45
Stylus Photo 790	2 pairs	£26.95
Stylus Photo 870	4 pairs	£48.95
Stylus Photo 875DC	Single Black	£8.95
Stylus Photo 890	Single Colour	£6.95
Stylus Photo 895	5 black	£41.95
Stylus Photo 1270	5 colour	£32.45
Stylus Photo 1290		
Stylus Color 300 (S020138)	Single 4.95	3 for £14.50

Very latest Epson Compatible Cartridges

Stylus C50/C60/810/820	Matched pair	£15.45
	Single Black	£8.95
	Single Colour	£7.95
Stylus C70/C80	Full Set BIC/MIY	£23.95
	Black	£8.95
	Per Colour	£5.95

Please call for volume pricing on these new products

The widest range of the highest quality compatible cartridges

Original HP/Lexmark ink jets



Original Lexmark

1380619	Colour	24.95
13400HC	Black	23.95
1382050	Black	24.95
1382060	Colour	25.95
12A1970	Black	20.95
12A1980	Colour	26.25
15M0120	Colour	27.85



Original Hewlett Packard Ink Jet Cartridges

51625A	Colour	21.75
51626A	Black	21.45
51629A	Black	21.45
51645A	Black	21.45
51649A	Colour	21.95
C1823D	Colour	23.95
C4844A	Black	29.95
C4841/2/3	Colour	29.95
C6578D	Colour	25.75
C6614A	Black	20.95
C6615D	Black	21.50
C6625A	Colour	24.95

Original Olivetti

Black	84435E	23.75
Black	84431W	18.75
Colour	84436G	29.75

Xerox Ink Carts

Ref:	Comp	OEM
8R766	2.35	9.25
7661/2/3	2.35	9.25

Print media... CD-R's & Zips...

Hewlett Packard Print Media

C6011AA4	Photo note card	20/pack	7.95
C5983A	A4 Glossy photo paper	20/pack	10.25
51634Z	A4 Premium coated paper	100/pack	12.25
C6050A	A4 Iron-on T-shirt media	10/pack	9.95
C6040A	A4 Premium photo paper	15/pack	6.10
C3837A	A4 Premium glossy paper	50/pack	31.95
C3832A	A4 Transparency film	20/pack	12.95

Epson Ink Jet Print Media

S0411215"	8" Ink jet card	30/pack	5.35
S041134	4" x 6" Photo paper	20/pack	4.90
S041061A4	Photo quality paper	100/pack	7.95
S041126	A4 Photo qual gloss paper	20/pack	5.90
S041145	A2 Panoramic paper	10/pack	10.50

Recordable CD's

Jewel cases except*	10 - 100	500+
Sony	0.54	0.50
TDK 80 min.	0.64	0.59
Mirror 80 min.*	9.95/pack/25	
Add Delivery	5.95	Call

Imega Zip Disks

100MB. PC/Mac	Each	7.95
250MB. PC/Mac		13.50



Camera Memory

128 MB compact	36.95
64 MB compact	26.95

USB Memory Card Readers

Compact/Smart Media 26.95

We always welcome enquiries and orders from Educational and Public Sector organisations

Compatible Ink Jet Print Media

				Printer	Comp
A4	T-shirt transfers	10/pack	7.95	LJ11111	23.50
A4	Photo quality gloss paper 127gsm	20/pack	4.95	LJ11P/111P	24.50
A4	Premium ink jet paper	100/pack	5.95	LJ4L/P	34.50
A4	OHP Transparency film	20/pack	5.95	LJ4/5	36.50
A4	Photo gloss paper 210gsm	50/pack	16.95	LJ6P	36.50
A4	Dri-photo gloss paper 150gsm d/s	50/pack	16.95	LJ6L	34.50
CD Labels (Press-It comp)	(labels)	50/pack	4.50	LJ1100	34.50
				LJ2100	54.95

Original cartridges - Canon & Epson Ink Jets

Original Canon Ink Jet Cartridges

BC-01	Black	16.75	BJI-201B	Black h/c	4.50
BC-02	Black	15.95	BJI-201	/colour	3.95
BC-05	Colour	18.95	BJI-642	Black	8.50
BC-06	Photo	19.95	BJI-643B	Black	12.50
BC-20	Black	21.50	BJI-643	/colour	16.95
BC-30	Black	23.50	BX2	Black	13.75
BC60	Black	24.95			
BCI-10	BI x 3	8.75			
BCI-11B	BI x 3	7.95			
BCI-11C	Col x 3	10.95			
BCI38k	Black	7.75			
BCI3	/colour	5.95			
BCI-21B	Black	4.75			
BCI-21C	Colour	10.25			
BCI61	Colour	16.45			



Original Epson Ink Cartridges

S020089	Colour	17.75	T013401	Black	11.95
S020093	Black	16.75	T014401	Colour	15.95
S020097	Colour	14.25	T017401	Black	22.50
S020108	Black	18.75	T018401	Colour	18.95
S020110	Colour	14.25	T003011	Black	23.35
S020118	Black	37.95	T005011	Colour	27.45
S020122	Yellow	37.95	T007401	Black	15.95
S020126	Mag'ta	37.95	T008401	Colour	14.95
S020130	Cyan	37.95	T009401	Colour	14.95
S020138	Colour	14.75	T026401	Black	18.95
S020187	Black	16.75	T027401	Colour	15.45
S020189	Black	17.95	T028401	Black	21.95
S020191	Colour	17.75	T029401	Colour	18.95
S020193	Colour	14.25	T032140	Black	24.95
T001011	Colour	27.45	T032_40	CIM/Y	10.45

All prices include VAT

All major credit/debit cards - No surcharge

No delivery charges

(Except data media & orders of less than £4 inc VAT)

HVS Cartridge Services

9 - 13 Hart Lane, Hartlepool TS26 8RJ

(Visitors Welcome: Mon - Fri 9am - 5pm)

Enquiries: 01429 291044

We reserve the right to amend prices and brands stocked without notice E&OE

All trademarks acknowledged



FreePhone our Order Line

0800 804 6664

7 days 8am - 8pm

Fax: 01429 860257

E-mail: t-tees@hvs.uk.com

WOW

Save up to 66% on
Computer and Printer Consumables
and get
Free Next Day Delivery!*

Top Brands

Printer Cartridges

No Minimum Order

- Electronic Media
- Cleaning Products
- Inkjet Papers
- Refills & Bulk Ink
- Computer Accessories
- Educational Software

To start saving visit our new website

www.cartex.co.uk

Its fast, 100% secure and open 24 hours a day

Or call us now on:

0870 2435610

fax: 0870 2435611
customer care: 0870 2435612



*Applies to online orders - Subject to stock availability

Revolt

Against corporate prices

Revolutionise

The way you buy software

www.rebellio.com

We specialise in a limited range of highly discounted quality products

Special Introductory Offers!



UK P&P £2.50



Norton Anti Virus 2002

Norton SystemWorks 2002

£25 inc vat

£32 inc vat

One of the leading Anti Virus programs for many years now.

The smartest way to keep your computer working.

Order Securely Online at www.rebellio.com
Call for Details 0151 625 9790

RIBBONS LASER TONERS INK REFILLS CPU'S MOTHERBOARDS MEMORY

DISKS CD-Rewriters CD-R media Hard Drives INK + TONERS

LOWEST PRICES Order Online full range of Inks and Toners

MOTHERBOARDS

JET INK

LETWAY 310C 51K CARTRIDGE, ON BOARD 30 SECOND & 60 SEC. 2 USB, 1000 16.52 990, 300, 115A
LETWAY 800-CH 51K CARTRIDGE, W/ SHARED MEMORY AND 87 SOCKET 1A 200/285 MHz P3
887AS, AT400, VIA KT388, 660 MHz, W/ SHARED MEMORY AND 87 SOCKET 1A 200/285 MHz P3
887AS, AT400, VIA KT388, 660 MHz, W/ SHARED MEMORY, ON BOARD SOUND, PCI, 140P, 100P, 285/350 FOR AMD
887AS, AT400, VIA KT388, 660 MHz, W/ SHARED MEMORY, ON BOARD SOUND, PCI, 140P, 100P, 285/350 FOR AMD

EX VAT INC VAT
SQUIRE 7 69.00
SQUIRE 8 69.00
SQUIRE 9 69.00
SQUIRE 10 69.00
SQUIRE 11 69.00
SQUIRE 12 69.00
SQUIRE 13 69.00
SQUIRE 14 69.00
SQUIRE 15 69.00
SQUIRE 16 69.00
SQUIRE 17 69.00
SQUIRE 18 69.00
SQUIRE 19 69.00
SQUIRE 20 69.00
SQUIRE 21 69.00
SQUIRE 22 69.00
SQUIRE 23 69.00
SQUIRE 24 69.00
SQUIRE 25 69.00
SQUIRE 26 69.00
SQUIRE 27 69.00
SQUIRE 28 69.00
SQUIRE 29 69.00
SQUIRE 30 69.00
SQUIRE 31 69.00
SQUIRE 32 69.00
SQUIRE 33 69.00
SQUIRE 34 69.00
SQUIRE 35 69.00
SQUIRE 36 69.00
SQUIRE 37 69.00
SQUIRE 38 69.00
SQUIRE 39 69.00
SQUIRE 40 69.00
SQUIRE 41 69.00
SQUIRE 42 69.00
SQUIRE 43 69.00
SQUIRE 44 69.00
SQUIRE 45 69.00
SQUIRE 46 69.00
SQUIRE 47 69.00
SQUIRE 48 69.00
SQUIRE 49 69.00
SQUIRE 50 69.00
SQUIRE 51 69.00
SQUIRE 52 69.00
SQUIRE 53 69.00
SQUIRE 54 69.00
SQUIRE 55 69.00
SQUIRE 56 69.00
SQUIRE 57 69.00
SQUIRE 58 69.00
SQUIRE 59 69.00
SQUIRE 60 69.00
SQUIRE 61 69.00
SQUIRE 62 69.00
SQUIRE 63 69.00
SQUIRE 64 69.00
SQUIRE 65 69.00
SQUIRE 66 69.00
SQUIRE 67 69.00
SQUIRE 68 69.00
SQUIRE 69 69.00
SQUIRE 70 69.00
SQUIRE 71 69.00
SQUIRE 72 69.00
SQUIRE 73 69.00
SQUIRE 74 69.00
SQUIRE 75 69.00
SQUIRE 76 69.00
SQUIRE 77 69.00
SQUIRE 78 69.00
SQUIRE 79 69.00
SQUIRE 80 69.00
SQUIRE 81 69.00
SQUIRE 82 69.00
SQUIRE 83 69.00
SQUIRE 84 69.00
SQUIRE 85 69.00
SQUIRE 86 69.00
SQUIRE 87 69.00
SQUIRE 88 69.00
SQUIRE 89 69.00
SQUIRE 90 69.00
SQUIRE 91 69.00
SQUIRE 92 69.00
SQUIRE 93 69.00
SQUIRE 94 69.00
SQUIRE 95 69.00
SQUIRE 96 69.00
SQUIRE 97 69.00
SQUIRE 98 69.00
SQUIRE 99 69.00
SQUIRE 100 69.00

AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	128MB PC100 SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	256MB PC100 SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	512MB PC100 SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	8GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	16GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	32GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	64GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	128GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	256GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	512GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1024GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2048GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4096GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	8192GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	16384GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	32768GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	65536GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	131072GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	262144GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	524288GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1048576GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2097152GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4194304GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	8388608GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	16777216GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	33554432GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	67108864GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	134217728GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	268435456GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	536870912GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1073741824GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2147483648GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4294967296GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	8589934592GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	17179869184GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	34359738368GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	68719476736GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	137438953472GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	274877906944GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	549755813888GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1099511627776GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2199023255552GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4398046511104GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	8796093022208GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	17592186444416GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	35184372888832GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	70368745777664GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	140737491553280GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	281474983106560GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	562949966213120GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1125899932426240GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2251799864852480GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4503599729704960GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	9007199459409920GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	18014398918819840GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	36028797837639680GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	72057595675279360GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	144115191350547200GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	288230382701094400GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	576460765402188800GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1152921530804377600GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	2305843061608755200GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4611686123217510400GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	9223372246435020800GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	18446744492870041600GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	36893488985740083200GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	73786977971480166400GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	14757395984296032000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	29514791968592064000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	59029583937184128000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	118059167874368256000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	236118335748736512000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	472236671497473024000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	944473342994946048000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	1888946685989892096000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	3777893371979784192000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	7555786743959568384000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	15111573487919136768000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	30223146975838273536000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	60446293951676547072000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	120892579903353094144000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	241785159806706188288000GB DDR SDRAM	CALL
AGT STRIKER 815P ATX ON BOARD SNO & PATA IDE 60C, 140P, 100P, 100P, 133MHz, 2	INC VAT	4835703	

ToneZoneUK.com

For Quality You Expect.

Print-Rite Stockist

Our Epson compatible cartridges offer vibrant, rich colours and solid blacks. The inks are micro filtered and are of the highest quality available offering superb print quality and colour match.

Compatibles For Epson:

Stylus: 200 400 440 460 480 500 580 600 640 660 670 700 740
750 760 800 820 850 860 880 900 980, 1200 1520 C20 C40

2+2 pack (2 blk & 2 col) £10.95

3+3 pack (3 blk & 3 col) £15.49

6+6 pack (6 blk & 6 col) £28.95

5 blacks £9.95 5 colours £17.95

Blacks e@ch £2.19

Colours e@ch £3.89

For the Stylus 300 £4.89 each or 5 pack £23.95

Already Chipped Cartridges For the 680, 777

Photo 790, 795, 870, 875, 890, 895, 1270, 1280, 1290

Black £6.95 (5pk £32.50) Colour £6.95 (5pk £32.50)

2+2 pack (2 blk & 2 col) £25.95

3+3 pack (3 blk & 3 col) £37.95

6+6 pack (6 blk & 6 col) £73.95

C50, C60
photo 810
Black £6.95
Colour £7.95

Special offer on Xerox compatibles 3 of each colour (C, M, Y & Blk) £17.99

Or 5 x cyan, 5 x magenta and 5 x yellow for £17.99 (Applies to C6/C8/XJ4C/XJ6C)
All Company, product and brand names listed are the property of their respective holders and are used only for reference purposes

**Also HP, Lexmark, Canon Compatibles & Originals
Paper, Batteries @ Low prices**

Gloss & Semi Gloss Photo Paper 167 gm

20 sheets £5.89, 50 sheets £11.99. Others available

Lithium Batteries from 95p

MD minidisc 99p or 10 for £8.90, 20 for £15.80

Prices include VAT & UK Delivery*

Most Credit / Debit Cards Accepted

www.tonezoneuk.com

Tel. 0870 800 1 800

Fax. 0870 800 2 800

*Free UK delivery on all orders of £3.00 and over

74 Vancouver Road, Worthing, West Sussex, BN13 2TG

RESELLER / TRADE WELCOME

E.C.B. DIRECT

**THE MUST-HAVE
STORAGE
DEVICE
FOR THE
21ST CENTURY**

NEW

- * DOWNLOAD ANYTHING YOU LIKE FROM THE INTERNET DIRECT TO YOUR OK-DRIVE.
- * SAVE SPACE ON YOUR COMPUTER'S HARD DRIVE.
- * TRANSFER AND STORE DATA EASILY & QUICKLY.
- * IDEAL FOR CARRYING FILES BETWEEN HOME AND OFFICE.

Store all MP3'S / PDA Data / Digital Camera Images
Plugs into USB PORT - NO External power required
Supports Windows 98/ME/SE, 2000, XP, IMAC & Linux
Hot Plug & Play / Size 9.15 X 2.4 X 1.4cm
Lightweight ONLY 17.5g / Includes USB extension lead
Price Includes VAT and delivery

32 mb (silver) £ 39.99

64 mb (transparent green) £ 57.99

128 mb (transparent clear) £ 94.99

256 mb (transparent red) £ 159.99

512 mb (transparent purple) £ 325.00

1 gb (transparent blue) ... £ 611.00

colours may vary



**Small, stylish storage that
will fit in your pocket!**

ORDER NOW

TEL 023 9243 1279 FAX 023 9234 9798

EMAIL e.c.b@telco4u.net

OPEN: 9am -8pm, 6 days a week

TRADE WELCOME

Giving you more

Choice

Stationery Supplies

100% Guarantee

These cartridges are made to ISO9000 standards and are guaranteed to be equal to, if not better quality, and have the same amount of ink as the manufacturer's original.

Epson Compatibles

Multi-packs available for most of the Epson Stylus range including: 200/400/440/460/480/500/580/600/640/660/PhotoEX/700/740/750/760/800/860/880/900/980/1160/1200/SCAN 2000 & 2500 & lots more!

Twin Pack
1 Black & 1 Colour
£5.29

Quad Pack
2 Black & 2 Colour
£9.75

Double Quad
4 Black & 4 Colour
£18.75

Mono Pack
5 Black Cartridges
£9.99

Colour Pack
5 Colour Cartridges
£17.50

Mega Pack
8 Black & 8 Colour
£36.99

VAT Inclusive Prices

FREE Delivery

Epson Stylus
C60/680/790/810/
870/890/1270/1290
Now On Sale -
Call for Price Details.

Canon Compatibles

Cartridge Ref.	Suitable for Use in	Price
BC01 Black	BJ10E/BJ10EX/BJ20	£ 9.35
BC02 Black	BJC150/BJ200/BJ220EX/BJC1000	£ 9.35
BC05 Colour	BJC150/BJ210/BJ220EX/BJC1000	£12.75
BC06 Photo	BJC240/BJC250/BJC1000	£13.75
BC20 Black	BJC2000/BJC4000	£10.45
BX02 Black	FAX B320/3410	£ 9.45
BX03 Black	FAX B100/110/MP10	£ 9.45
BJC4000 Twin	2000/4000/5000 (BCi21B & BCi21C)	£ 4.39
BJC3000/6000	Black	£ 4.49
BJC3000/6000	Each Individual Colour	£ 4.49

HP Compatibles

Cartridge Ref.	Suitable for Use in	Price
51626A Black	500/510/520/540/550C/560C	£10.25
51625A Colour	310/320/340/540/550/560	£12.99
51629A Black	600/660/690C/695C	£10.45
51649A Colour	600/610C/612C/660C/690C/695C	£14.99
51645A Black	710C/720C/820CXI/850CXI/870CXI	£ 9.95
51633A Black	310/320/340	£10.45
C6614ABlack	610C/612C	£10.75
C6615ABlack	810C/840C/843C	£11.75
C1823AColour	710C/720C/810C/815C/820C/895C	£15.49
C6578AColour	970CXI/930C/950C/1220C/P1000	£16.99
C6625AColour	840C/843C	£16.99

Lexmark Compatibles

Cartridge Ref.	Suitable for Use in	Price
13619HC Colour	1000/1020/1100/2030/2050/3000	£15.29
13400HC Black	1000/1020/1100/2030/2050/3000	£13.89
12A1980 Colour	3200/5000/5700/7000/Z11/Z31	£15.29
12A1970 Black	3200/5000/5700/7000/Z11/Z31/Z51	£13.89
15M0120 Colour	Z42/Z51/Z52	£17.50
17G0050 Black	Z12/Z22/Z32	£13.89
17G0060 Colour	Z12/Z22/Z32	£15.29

The price you see is **TOTAL** Inc. VAT **FREE** DELIVERY

10% Price Buster

"We constantly monitor our prices to ensure we offer you the best value, should you happen to find any of our cartridges cheaper elsewhere, we will beat it by up to 10%!"
Terms & conditions apply.

High Quality CD-R

80 minute 24 speed 25 x CD-R £ 9.99 50 x CD-R £18.99 100 x CD-R £34.99

Specialist Inkjet Papers

A4 Gloss Range

Photo Gloss 140gsm 20 sheets	£ 4.49
Photo Gloss 140gsm 50 sheets	£10.99
Instant Dry Satin 150gsm 20 sheets	£ 5.99
Instant Dry Gloss 160gsm 20 sheets	£ 5.49
Instant Dry Gloss 180gsm 50 sheets	£12.99
Instant Dry Gloss 210gsm 50 sheets	£18.99
Instant Dry Gloss 254gsm 20 sheets	£ 9.99
Instant Dry Gloss Self Adhesive 20 sheets	£ 4.99
Double Sided Gloss 20 sheets	£10.99
7x5 Photo Cards	£ 4.99

A4 Matt Range

Coated Matt 100gsm 100 Sheets	£ 5.99
Coated Matt 100gsm 200 Sheets	£11.75
Coated Matt 140gsm 100 Sheets	£ 7.49
Coated Matt 160gsm 100 Sheets	£ 9.75
Coated Matt 210gsm 100 Sheets	£11.45

Others

Business Card Pack 250 Cards	£ 3.99
Clear OHP Film 10 Sheets	£ 4.99
A6 Greeting Cards & Envelopes Pack 25	£ 5.49
A5 Greeting Cards & Envelopes Pack 25	£ 6.99
T Shirt Transfer Pack 10 Sheets & Instructions	£ 5.99
Dark T Shirt Transfer Pack 10 Sheets & Instructions	£ 5.99
CD Labels Matt Coated Pack 20 (2 per Sheet)	£ 2.99
CD Labels Gloss Coated Pack 20 (2 per Sheet)	£ 6.20
Day Bright Paper 5x Green 5x Yellow 5x Orange	£ 3.99

NEW! Funline Range

PUZZLE JET..... Make professional looking jigsaw puzzles with the picture of your choice. The ideal gift for family or friends. Make a jigsaw with your favourite football team, your boyfriend or girlfriend - the possibilities are endless.



Choice Price £ 6.99

STICKY JET..... Crystal clear self adhesive Injet film, for all Inkjet printers. Suitable for up to 1440 dpi, for stickers, name plates, window and document labels, etc.



Choice Price £ 6.25

CD Case Labels Pack 10 Sheets	£6.49
CD Cover Pack 10 Sheets	£6.49

NEW! Funline Range



GLOW IN THE DARK T SHIRT TRANSFER.... Design, print and transfer your image to a T Shirt, cap, etc. and achieve an amazing glow in the dark effect. T Shirt not included.



TATTOO JET..... Design and print your tattoo onto the special transfer film and stick it to a clean area of skin! That's all there is to it. Now you can have the body art you always wanted without the pain and with no regrets.

PC CD Rom Software

WORMS. WORLD PARTY. You are invited to the ultimate gaming experience, those loveable worms are back again, annihilating each other with zany weapons on wacky landscapes.



Choice Price £ 9.00

Choice Price £ 9.00

ESS384

ENCYCLOPAEDIA BRITANNICA DELUXE MILLENNIUM EDITION.

With thrilling multimedia - videos, music, animation, photography and more, this CD Rom provides endless education and entertainment for anyone who wants to learn.

All Our Prices Include VAT! - FREE Delivery - Same Day Despatch!
No Minimum Order! - Free Technical Advice!
All Major Credit Cards Accepted - No Surcharges!
100% No Quibble Guarantee On All Our Products!

FREEPHONE 0800 093 3738

Telephone 0870 44 22 460 Fax 0870 44 22 461

Choice Stationery Supplies Ltd, Unit 2 Mart Road Industrial Estate, Minehead, Somerset, TA24 5BJ.

Personal Callers Welcome.

Please call or visit web site for up to date prices. All Trademarks recognised. E & OE.

Secure Online Shopping

@ www.choicestationery.com

BUYING ADVICE

Here are some *PCW* guidelines to help ensure that the buying process is smooth and trouble-free

KEEP RECORDS >

When you phone a supplier, make a note of the name of the person you speak to, and when. Note down any claims they make for the product in which you are interested, or any specifications they mention. If you are unsure that what they are offering is right for the task, then ask.

BE CLEAR ABOUT SUPPORT AND WARRANTIES >

Make sure you get a warranty that suits your needs and is fully detailed in the quotation. If you need swift repairs, consider paying extra for an eight-hour repair service. Also make sure you understand the level of service you can expect to receive, including who pays for couriers if your machine has to be returned for repair.

GET A FULL SPEC OF THE MACHINE >

Before you place an order for a machine, insist on being faxed or emailed a full specification, detailing all components and peripherals. Check what is included: for example, when buying a printer, are all cables and cartridges bundled? If you've used a review in a magazine to guide your decision, make sure that what is quoted matches what you have read. Sometimes, machine specifications can change from the model sent for review.

CREDIT CARD PROTECTION >

When you place your order, use a credit card. The Consumer Credit Act ensures that credit card purchases between £100 and £30,000 are covered. Check the address to which the goods will be sent. Often, if you buy with a credit card you can only receive the goods at the address on the card. If you are buying over the Internet, make sure you are using a secure server, sometimes denoted by the prefix 'https'.

SET THE DELIVERY DATE AND CHECK WHAT IS DELIVERED >

This gives you some comeback if the goods are not delivered on time. When the goods arrive, check the packaging before you sign for them, to guard against damage in transit.

PERSONAL
COMPUTER
WORLD

BUYERS' CHARTER

MAIL ORDER PROTECTION SCHEME (MOPS) > When you order goods as a private individual reader from a UK supplier's advertisement in *PCW* and pay by post in advance of delivery to that Mail Order Advertiser, which subsequently ceases to trade and goes into Liquidation or Bankruptcy prior to delivery of such goods, you may, under the 'Buyers' Charter', qualify for compensation, providing:

1. You have not received the goods or had your money returned.
2. You have followed the *PCW* guidelines when placing your order (see above).
3. You have taken all reasonable steps to effect delivery or refund.
4. You have retained irrefutable proof of purchase, for verification purposes:
 - a) The original advertisement from which the goods were ordered.
 - b) Comprehensive proof of payment.

GUIDELINES > Claims must be submitted so as to arrive 'NOT EARLIER THAN TWENTY-EIGHT DAYS AND NOT LATER THAN THREE MONTHS' from the official on-sale date of the magazine. Claims must be submitted to the Customer Services Manager IN WRITING, summarising the situation and lodged strictly within the time schedule stated. Claims received outside this period will not qualify for consideration for compensation under the 'Buyers' Charter'.

Once a supplier who has advertised in this magazine has become subject to either Liquidation or Bankruptcy proceedings and upon completion of all winding-up procedures, *PCW* guarantees to expeditiously process those private individual readers' claims made and submitted, in accordance with those procedures outlined, up to the following limits.

- a) £2,000 in respect of any claim submitted by one Private Individual Reader.
- b) £100,000 in respect of all advertisers so affected in any one year.
- c) £30,000 in respect of any one advertiser.

These sums define the Publisher's maximum liability under the scheme, and any additional payments above and beyond these thresholds will be entirely at the Publisher's discretion. As soon as legal confirmation that a state of liquidation or bankruptcy exists, the processing of claims will immediately commence. If,

however, assets are available and the receiver/liquidator appointed confirms that an eventual payment will be made by way of a dividend, all claims under the 'Buyers' Charter' will be subject to reprocessing and will take into account any shortfall which may then exist. Payments under the scheme will also take into consideration the obligations and liabilities of other interested parties, such as credit card and/or insurance organisations, etc.

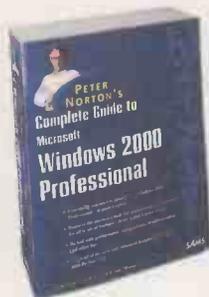
EXCEPTIONS > This guarantee only applies to advance postal payments made by private individuals in direct response for goods itemised/illustrated in display advertisements. It does not cover goods ordered from advertising Inserts or Cards, classified advertisements or Micromart, or Catalogues obtained from, or supplied by, any advertiser regardless. Similarly, protection does not exist in relation to purchases made as a result of reviews and/or editorial comment. The 'Buyers' Charter' is designed to safeguard the PRIVATE individual reader. It does not provide protection to any companies, societies, organisations, unincorporated bodies or any other commercially orientated outlet of any description. Neither is cover provided for orders placed from, or to, any overseas suppliers or for goods purchased for resale.

CAVEAT EMPTOR > Readers are reminded that the Mail Order Protection Scheme was solely implemented to provide protection to the private individual when goods are ordered 'Off the Page' and paid for by post. It was not designed for, nor will it offer any protection, in the event whereby goods are purchased via the Internet.

CREDIT CARD PROTECTION > Always pay by credit card when ordering goods valued in excess of £100, thereby ensuring maximum protection in the event that an advertiser ceases to trade prior to such goods actually being received.

DISCLAIMERS > Readers are reminded that the opinions expressed, and the results published in connection with reviews and/or laboratory test reports carried out on computing systems and/or related items, are confined to, and are representative of, only those goods as supplied and should not be construed as a recommendation to purchase. Whilst every precaution is taken to ensure that reliability and good business practices prevail, the Publisher cannot be held responsible for the overall trading activities of any supplier referred to, or advertising within, this publication.

PCW brings you a selection of IT-related books that we think will be of interest to our readers, with a discount on the recommended retail price plus **FREE delivery** (within the UK) direct to your door.



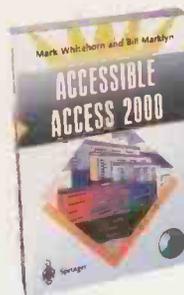
PETER NORTON'S COMPLETE GUIDE TO MICROSOFT WINDOWS 2000 PROFESSIONAL

Peter Norton, John Mueller and Richard Mansfield

This book follows the comprehensive, user-friendly and highly acclaimed Norton style. Its unique, hands-on, step-by-step approach teaches the features of Windows 2000 Professional. 1,628pp

REC. RETAIL	READER PRICE	SUBSCRIBER PRICE
£28.99	£26	£24

QUOTE ORDER CODE: VR09



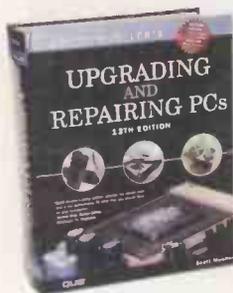
ACCESSIBLE ACCESS 2000

Mark Whitehorn and Bill Marklyn

Written by Hands On columnist Mark Whitehorn and Bill Marklyn (development manager for the first two major releases of Access), this book assumes you have no knowledge of Access or databases and takes you to the point where you can create and use a multi-table database. 318pp plus CD-Rom.

REC. RETAIL	READER PRICE	SUBSCRIBER PRICE
£24.50	£22	£19.50

QUOTE ORDER CODE: VR19



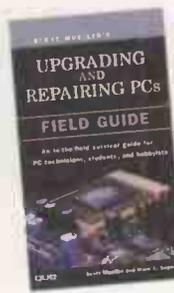
UPGRADING AND REPAIRING PCs 13TH EDITION

Scott Mueller

Whether you're a PC technician, student or hobbyist, this is for you. Includes new and revised illustrations for more technical detail, a step-by-step guide to building a PC and information on motherboards, Bios, EIDE and SCSI interfaces, net connectivity and all the latest PC innovations. 1,566pp

REC. RETAIL	READER PRICE	SUBSCRIBER PRICE
£43.23	£39.99	£38.99

QUOTE ORDER CODE: VR02



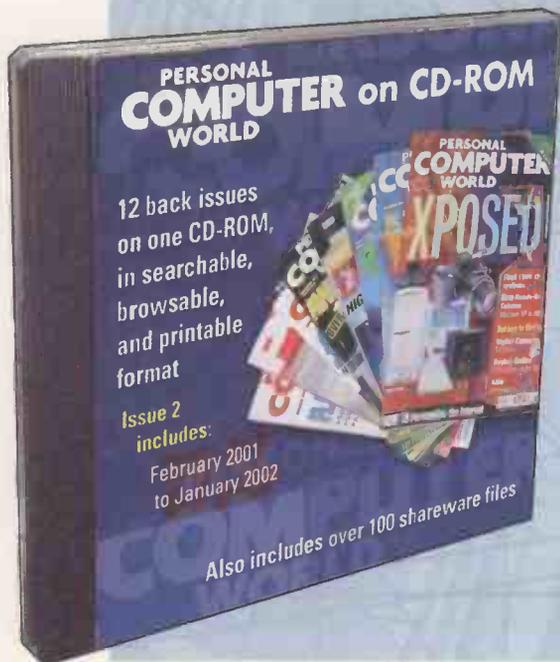
UPGRADING AND REPAIRING PCs FIELD GUIDE

Scott Mueller

The Field Guide is a portable 'essentials' version of the 13th edition (see left). If you're out of the office and need some advice on upgrading or repairing a PC, this book will give you all the essentials. And, weighing less than half a pound, it'll fit into your briefcase or bag. 320pp

REC. RETAIL	READER PRICE	SUBSCRIBER PRICE
£14.50	£13.79	£13

QUOTE ORDER CODE: VR03



PCW ON CD-ROM ISSUE 2

NEW! AVAILABLE NOW

Includes February 2001 to January 2002 issues

Issue 2 of PCW on CD-Rom is now available. The disc contains 12 complete back issues from February 2001 to January 2002.

The new CD-Rom includes news items, reviews, features, group tests, *pcwexperts* and Hands On articles plus a list of all advertisers from the 12 issues. We've also included over 100 shareware files.

All articles appear on screen exactly as they did in the magazine, and the editorial content is searchable, browsable and printable in Acrobat format.

CD 2 NOW AVAILABLE!	READER PRICE	SUBSCRIBER PRICE
	£14.95	£13.45

QUOTE ORDER CODE: VR21

HOW TO ORDER

Using the form opposite, you can post your order to:
PCW Offers Direct
Tower Publishing Services Ltd
Tower House
Sovereign Park
Market Harborough
Leicestershire LE16 9EF

Or phone us: 01858 438 883
Or fax us: 01858 468 969

Or log on to:
<http://offersdirect.pcw.co.uk>

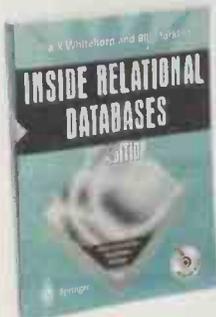


PHOTOCOPIED COUPONS WILL BE ACCEPTED IF YOU DO NOT WISH TO CUT UP YOUR MAGAZINE.

PLEASE ALLOW 28 DAYS FOR DELIVERY.

ONLY SUBSCRIBERS TO PCW ARE ENTITLED TO DISCOUNTED PRICES MARKED 'SUBSCRIBER PRICE'.

For more discounted books, PCW back issues and CD-Roms, please visit <http://offersdirect.pcw.co.uk>



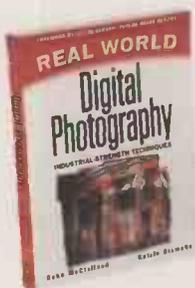
INSIDE RELATIONAL DATABASES 2ND EDITION

Mark Whitehorn and Bill Marklyn

This best-selling book has been revised and updated, bringing you a reader-friendly explanation of the relational model and its importance to database designers and builders. Clear explanations and examples show you how understanding the relational model can make databases better. 339pp.

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£24.59	£22	£19.99

QUOTE ORDER CODE: VR11



REAL WORLD DIGITAL PHOTOGRAPHY

Deke McClelland and Kartin Eismann

Digital Photography features up-to-date descriptions of digital cameras, expert advice for shooting better photographs and tips for preparing images for print and web output. It also includes information on how to build a digital darkroom, plus practical image-editing techniques. 403pp plus CD-Rom.

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£33.99	£32	£30

QUOTE ORDER CODE: VR13



WINDOWS XP FAST AND EASY

Diane Koers

This guide provides a visual learning tool for Windows XP, with step-by-step instructions and action shots

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£16.99	£16.50	£16

QUOTE ORDER CODE: VR20



PROTECT YOUR DIGITAL PRIVACY SURVIVAL SKILLS FOR THE INFORMATION AGE

Glee Harrah Cady, Pat McGregor

A book teaching you how to protect your privacy when using digital devices that connect to the Internet such as PCs, wireless phones and game consoles.

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£21.99	£20.89	£19.79

QUOTE ORDER CODE: VR08



PHOTOSHOP 6 KILLER TIPS

Scott Kelby

A book for the professional Photoshop user, full of tips showing you how to be more efficient and productive.

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£30.99	£30	£28

QUOTE ORDER CODE: VR04



TUNE UP YOUR PC IN A WEEKEND

Faithe Wempen

Essential for the home PC enthusiast, this book enables you to troubleshoot and correct processes on your PC. It helps you speed up Windows, correct errors, detect and remove viruses and upgrade.

REG. RETAIL	READER PRICE	SUBSCRIBER PRICE
£14.99	£14.50	£13.50

QUOTE ORDER CODE: VR12

LEISURE LINES COMPETITION

COMPETITION

WIN!



CAMERAS, SCANNER & CD-RW FROM BENQ

To celebrate the rebranding of Acer Communications and Multimedia, the newly named Benq is offering five *PCW* readers the chance to win some great prizes.

The first prize is the DC3310 digital camera, worth £349.90 inc VAT. This stylish 3.1 megapixel camera has a retro feel, a compact design and is easy to use. Next up is the 2.1 megapixel DC2110 digital camera, worth £199.90. This has a 2x digital zoom and auto-focus lens. It also allows you to produce up to 20 seconds of video.

If you win the third prize, you'll get Benq's 7400UT flatbed scanner. This is a top-of-the-range 2,400dpi (dots per inch) offering, with a built-in transparency unit and USB2 connection. The scanner, which costs £199.99, is compatible with USB 1.1, although a USB2 PCI card is included in the box.

The next name out of the hat wins a CRW 2410 EU external USB2 CD writer, worth £189.99. This is bundled with a USB2 PCI host card. It includes a Seamless Link III buffer under-run function for safe and high-quality burning.

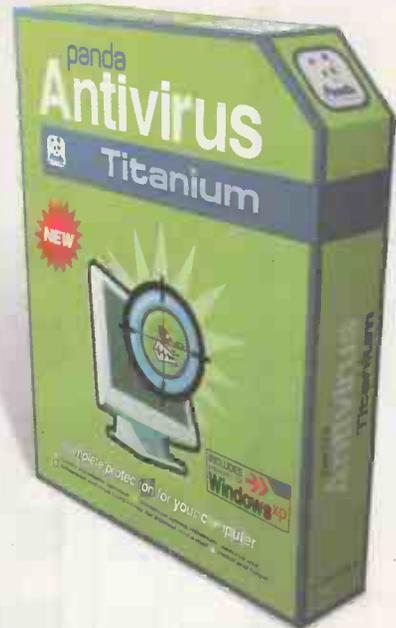
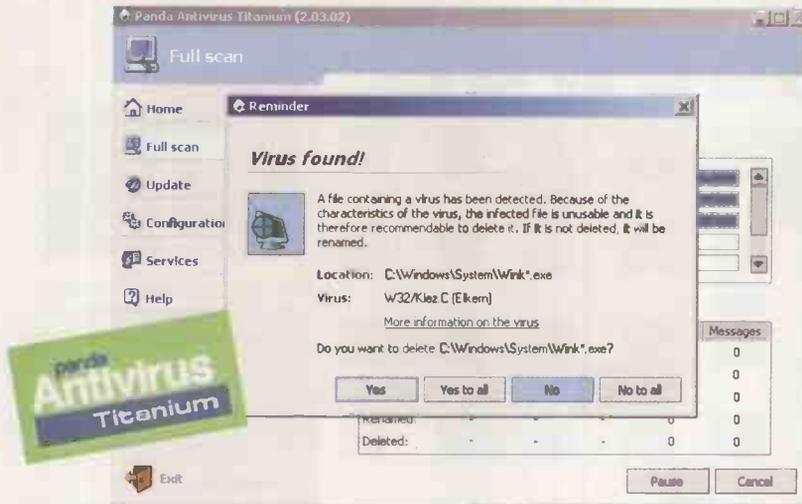
The final prize is the DC300 Mini digital camera, worth £59.90. This combined PC cam/webcam is a stylish, compact, entry-level camera that is also fun to use.

For more information on Benq, check out www.benq.co.uk or call us on 01633 628 600.

For your chance to win one of these great prizes answer the following question and follow the 'How to enter' instructions opposite.

What is the megapixel resolution of the DC3310 camera?

50 COPIES OF PANDA ANTIVIRUS TITANIUM



Panda Antivirus Titanium is a new generation of anti-virus products whose innovative features provide complete protection for your computer.

Designed with the home user in mind, Panda Antivirus Titanium, is an easy-to-use solution complete with the latest in anti-virus technology.

It detects and eliminates more than 63,000 known viruses and other threats to your computer's security, including Trojans, worms and other nasty infections. You can now feel safer as you read your email, browse the Internet or use unsecured discs.

This 'install and forget' solution has been developed with ease of use in mind: it is user-friendly, intuitive, provides automatic updates and produces straightforward reports whenever it scans. It will also run on any edition of Windows, including XP.

The new Ultrafast virus scan engine is extremely fast; Titanium exhaustively scans all information and barely uses any system resources. You'll be protected from danger without even noticing what's going on in the background.

Whenever you connect to the Internet, Titanium automatically checks for updates to its virus

database and downloads the necessary changes. The whole process takes place rapidly, while you continue working or browsing, giving you peace of mind without any effort.

Courtesy of PCW and Panda, 50 readers can win a copy of Panda Antivirus Titanium. For your chance to get hold of a copy of Panda Antivirus Titanium, just answer the following question and follow the 'How to Enter' instructions opposite.

In excess of how many viruses and other threats will Antivirus Titanium detect and eliminate?

How to enter

Fill in the coupon and send to the following address by 28 June 2002:

July Competition, PCW, VNU Business Publications, 32-34 Broadwick Street, London W1A 2HG
Or email your answer, name, address, daytime and mobile telephone number to us at pcw_competition@vnu.co.uk

We may use the contact details supplied to communicate with you regarding PCW. Please indicate in your email if you are also happy for us to contact you via email, daytime telephone or mobile about other products or services available from PCW and the VNU Business Publications Ltd Group, and if you are happy for us to pass your details on to other carefully selected companies to contact you about their products or services. Please state in your email if you do NOT wish us to contact you BY POST about products or services available from PCW or the VNU Business Publications Group, and if you do NOT wish us to pass your details on to other carefully selected companies to contact you BY POST about their products or services.

Competition open to UK residents only.

PCW JULY 2002 PANDA ANTIVIRUS TITANIUM COMPETITION ENTRY FORM

Answer **In excess of how many viruses and other threats will Antivirus Titanium detect and eliminate?**

Name:

Address:

Email address:

Daytime telephone number:

Mobile telephone number:

We may use the contact details supplied to communicate with you regarding PCW.

If you are also happy for us to contact you about other products or services available from PCW and the VNU Business Publications Ltd Group, please indicate here. Contact by: Email Telephone Mobile

If you are happy for us to pass your details on to other carefully selected companies to contact you about their products or services, please indicate here. Contact by: Email Telephone Mobile

If you do NOT wish us to contact you BY POST about products or services available from PCW or the VNU Business Publications Group, please indicate here

If you do NOT wish us to pass your details on to other carefully selected companies to contact you BY POST about their products or services please indicate here

**PERSONAL
COMPUTER
WORLD**

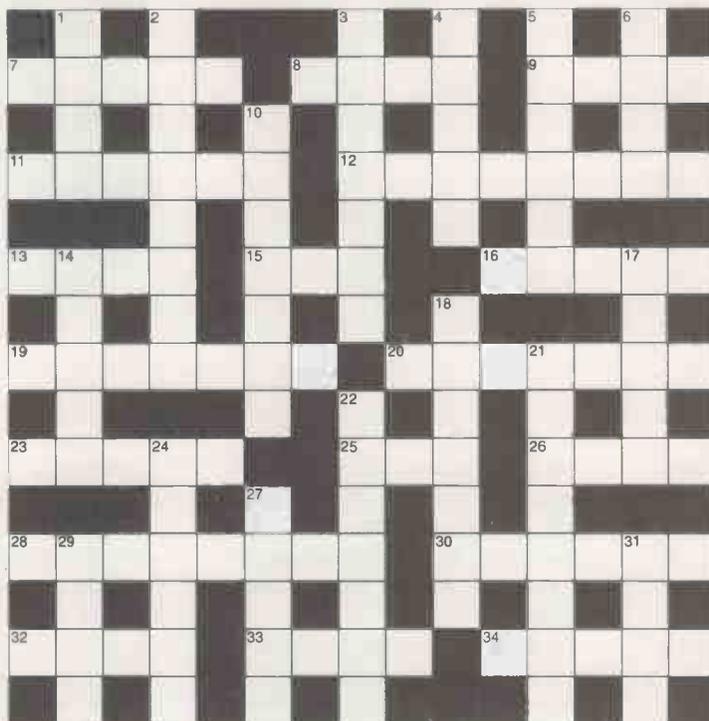
Stretch your mind...

Got five minutes to spare? Then put your little grey cells to the test and try out our crossword and brainteaser. Send in your entries for a chance to win a dictionary or Encarta Reference Suite 2001

prize crossword

ACROSS

- 7 Text that runs into the gutter! (5)
- 8 Search for a file (4)
- 9 Uppermost hierarchy level (4)
- 11 Programs performing background tasks (6)
- 12 The movement of information through the system (4, 4)
- 13 ___ frequency, CPU's clock speed (4)
- 15 ___ resolution, poor-quality appearance (3)
- 16 Internet search engine (5)
- 19 Areal ___, bits per sq inch of surface (7)
- 20 Erased a file (7)
- 23 Operating (5)
- 25 Internet access provider (acronym) (3)
- 26 Locked up, frozen (4)
- 28 Lowering of power voltage (8)
- 30 Out-of-date Internet page (6)
- 32 Title ___, Windows nameplates (4)
- 33 Organise data (4)
- 34 Listed particulars (5)



DOWN

- 1 Obstruct (4)
- 2 Goes in again (8)
- 3 Rest your feet (3, 4)
- 4 Supervises publication (5)
- 5 Sly (6)
- 6 Proverbially dead bird! (4)
- 10 Put in quarantine (7)
- 14 Cookers (5)
- 17 Sea (5)
- 18 Imitation (7)
- 21 Items on display (8)
- 22 Set of large guns (7)
- 24 Fairly recent (6)
- 27 Show off (5)
- 29 ___ Giggs, footballer (4)
- 31 Jane Austen novel (4)

Latin square

A misprint in the June issue meant the brainteaser was all but impossible to solve. We're repeating the puzzle with the correct information here, to give you another chance to win a copy of Encarta Reference Suite 2001. Apologies to readers who were confused.

Each cell of the square on the right contains one of the digits from 1 to 7. Each row and each column has exactly one of each digit. The clues below give the total of two, three or four cells. Can you figure out what number is in each cell?

See right for details of how to enter.

- A1234 = 13
- ABC4 = 7
- ABCD1 = 10
- B567 = 15
- BCD6 = 17
- C12 = 7
- CDEF7 = 14
- D123 = 10
- DE3 = 11
- E567 = 6
- EFG2 = 10
- FG5 = 13
- F3456 = 10
- G123 = 11

7							
6							
5							
4							
3							
2							
1							
	A	B	C	D	E	F	G



Each month, one PCW Crossword entrant will win a copy of Chambers' 21st Century Dictionary, and the brainteaser winner gets a copy of Encarta Reference Suite 2001. Send your completed crossword to: 'PCW July - Prize Crossword', VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive no later than **17 June 2002**.

Send the answers to the brainteaser to: 'PCW July - Prize Puzzle', at the address above, to arrive no later than **28 June 2002**.

Please state clearly on your entry if you DO NOT wish to receive information about other products and services from VNU Business Publications Ltd. Please state if you DO NOT wish your details to be passed on to other carefully selected companies for marketing purposes. No purchase of the magazine is necessary to enter the competition.

May winners

Tim Boume from Horsham got May's crossword right and Tony Bajan from Kilmarnock is the winner of May's brainteaser. Congratulations to you both.

SOLUTIONS

June crossword

- ACROSS** 7 Wheel 8 Font
 9 Redo 11 Tweaks 12 Linefeed
 13 Deci 15 Art 16 Using 19 Using
 20 Hewlett 23 Merit 25 Ami
 26 Most 28 Cookbook 30 Output
 32 Kern 33 Near 34 Inner
DOWN 1 Thaw 2 Sedative
 3 Pollute 4 Stank 5 Crufts 6 Arie
 10 Escaptee 14 Ernie 17 Notes
 18 Venison 21 Limiting 22
 Walkway 24 Irking 27 Hound
 29 Owen 31 Used

May brainteaser

The solution to May's brainteaser appears below:

	Nick	Steve	Eddie	Willie
	No	Hons	No	Hons
Clubs	2	2	KQ	5
Diamonds	5	KQJ	5	2
Hearts	4	A	3	KQ
Spades	2	3	A	5

monitors

PHILIPS

Model	Size	Ex VAT	Inc VAT
105521	15"	£82	£96.35
1076	17"	£94	£110.45
107521	17"	£127	£148.05
107721	17"	£126	£148.05
109520	19"	£156	£183.30
109820	19"	£205	£240.88
109920	19"	£249	£292.58
201810	21"	£415	£487.63
1505	15" TFT	£267	£313.73
15082	15" TFT	£312	£366.60
15092	15.1" TFT	£365	£428.88
150X	15" TFT	£459	£539.33
170528	17" TFT	£489	£574.58
17082M	17" TFT	£535	£628.63
180P	18" TFT	£749	£880.08

LG ELECTRONICS

Model	Size	Ex VAT	Inc VAT
SW563N	15"	£75	£88.13
SW775E	17"	£97	£113.98
SW9008	19"	£159	£186.83
SW221U	21"	£119	£142.33
553LE	15" TFT	£272	£319.60
577LM	15" TFT	£359	£421.83
882LE	18" TFT	£719	£844.83

TAXAN

Model	Size	Ex VAT	Inc VAT
V735	17"	£135	£158.63
V977	19"	£187	£221.73
V2285T	22"	£545	£640.38
680T	15" TFT	£343	£403.03

MITSUBISHI

Model	Size	Ex VAT	Inc VAT
Plus 73	17"	£147	£172.73
PRO740	17"	£167	£196.33
Plus 92	19"	£244	£286.70
PRO2060U	22"	£519	£609.83

IYYAMA

Model	Size	Ex VAT	Inc VAT
Vision 1352	15"	£91	£106.93
Vision Master 1402	17"	£119	£139.83
Vision Master 407	17"	£169	£199.58
Vision Master Pro 1411	17"	£135	£158.63
Vision Master Pro 413	17"	£169	£199.58
Vision Master 1451	19"	£165	£193.88
Vision Master 452	19"	£230	£270.25
Vision Master Pro 454	19"	£285	£334.88
Vision Master 505	21"	£480	£564.00
Vision Master Pro 511	22"	£475	£558.13
AX3817U	15" LCD	£319	£374.83
AS4314UT	17" TFT	£459	£539.33
AS4611UT	18" TFT	£599	£703.83

SAMSUNG

Model	Size	Ex VAT	Inc VAT
Syncmaster 551S	15"	£76	£89.30
Syncmaster 753S	17"	£100	£117.50
Syncmaster 753DF	17"	£109	£128.08
Syncmaster 955B	19"	£165	£193.88
Syncmaster 957P	19"	£179	£210.33
Syncmaster 1100P	21"	£415	£487.63
Syncmaster 151S	15"	£285	£334.88
Syncmaster 171S	17" TFT	£469	£551.08
Syncmaster 181T	18" TFT	£639	£750.83
Syncmaster 191T	19" LCD	£919	£1079.83

SONY

Model	Size	Ex VAT	Inc VAT
E230	17"	£215	£252.63
A230	17"	£216	£253.80
E430	19"	£289	£339.58
G420	19"	£379	£445.33
G520	21"	£582	£683.85
M51D	15" TFT	£359	£421.83
M61	16" TFT	£545	£640.38
M81	18" TFT	£809	£950.58
FW 900	18" TFT	£1159	£1361.83

NEC

Model	Size	Ex VAT	Inc VAT
FE700	17"	£146	£171.55
FE700M	17"	£165	£193.88
FE950	19"	£255	£299.63
FP1375	22"	£599	£703.83
1550V	15" TFT	£305	£358.38
LCD1700V	17" TFT	£509	£598.08
LCD1830	18" TFT	£679	£797.83

ADI

Model	Size	Ex VAT	Inc VAT
Provista M500	15"	£89	£104.58
Microscan M700	17"	£122	£143.35
Microscan F720	17"	£155	£182.13
Microscan E66	19"	£188	£220.90
Microscan G910	19"	£329	£386.58
Microscan G1000	21"	£459	£539.33
Microscan A600	15" TFT	£369	£433.58
Microscan L912	18" TFT	£929	£1091.58

CTX

Model	Size	Ex VAT	Inc VAT
VL500	15"	£74	£86.95
VL 700	17"	£96	£112.80
EX 700F	17"	£125	£146.88
VL 1300	21"	£389	£457.08
PV 505	15"	£270	£317.25
PV 720	17" TFT	£475	£558.13
PV880 TFT	18" TFT	£649	£762.58



serving you since 1988

make it easy...

Why not make it easy on yourself by shopping on-line at www.javelincomputers.com

You'll get direct access to our comprehensive product range at the best value prices!!!



Features include:

- Secure on-line ordering using SSL Encryption Technology
- Simple, easy to follow instructions
- Unbeatable special deals
- Top 10 selling products
- Easy selection of product categories

6 ways to buy



- 1. Visit our showroom**
Open six days a week
Mon - Fri 9am-6pm; Sat 9am-1pm
- 2. Telephone**
Open six days a week as above
Simply ring 01254 505505
- 3. Fax**
Lines open 24 hrs a day
Fax your order to 01254 691466
- 4. On-line**
Browse at your leisure
On www.javelincomputers.com
- 5. By post**
To: Javelin Computers, Javelin House,
Dyneley Rd, Blackburn BB1 3AB
- 6. E-mail**
Send your order
to: sales@javelincomputers.com

www.javelincomputers.com

NEW PCs FROM SONY

PCV RX201 BUNDLE

- Intel Pentium 4 1.60 Ghz
- 256MB (Upg to 512MB) SDRAM
- 60 GB Hard Disc Drive
- NVIDIA GeForce2 Ti 64Mb
- Sony E230 17" Monitor
- DVD & CD RW Drive
- Multimedia: External Speakers
- I-Link (IEEE1394) Port
- V90 56K Flex Modem
- Sony VAIO World Software
- Dimensions Main Unit (W x H x D): 203 x 366 x 371mm
- Microsoft Windows XP Home

£851.21 ex VAT
£999.00 Inc VAT

Warranty: 1 Year

SONY

PCV RX202

- Intel Pentium 4 1.8 Ghz
- 256MB (Upg to 512MB) SDRAM
- 80 GB Hard Disc Drive
- NVIDIA GeForce2 Ti 64Mb
- Memory Stick Slot
- DVD & CD RW Drive
- Multimedia: External Speakers
- I-Link (IEEE1394) Port
- V90 56K Flex Modem
- Sony VAIO World Software
- Dimensions Main Unit (W x H x D): 203 x 366 x 371mm
- Microsoft Windows XP Home
- Warranty: 1 Year
- Monitor sold separately

£824.68 ex VAT
£969.00 Inc VAT

PCV RX203

- Intel Pentium 4 2.0 Ghz
- 512MB SDRAM
- 120 GB Hard Disc Drive
- NVIDIA GeForce2 Ti 64Mb
- Memory Stick Slot
- DVD & CD RW Drive
- Multimedia: External Speakers
- I-Link (IEEE1394) Port
- V90 56K Flex Modem
- Sony VAIO World Software
- Dimensions Main Unit (W x H x D): 203 x 366 x 371mm
- Microsoft Windows XP Home
- Warranty: 1 Year
- Monitor sold separately

£1233.19 ex VAT
£1449.00 Inc VAT

VAIO PCG-F601



SONY

- Mobile AMD 1.1 Ghz
- 256 Mb Ram (upgradable to 512Mb)
- 20 Gb Hard Disk Drive
- Integral Bx DVD ROM drive
- Built-in Ethernet 10/100 RJ45
- 14.1" TFT colour display
- 1024 x 768 Resolution
- Intel Graphic Technology with 11 Mb Max Dynamic Video Memory
- Built-in Modem V90 K56 flex
- Link Connector, 2 USB ports, Serial & Parallel Ports
- Touchpad Mouse
- Microsoft Windows XP Home
- 1 Year Warranty (Ext to 3 years with VAIO Plus Warranty Pack)

£889.00 ex VAT
£1044.58 inc VAT

notebooks

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
Vaio PCG-C1MGP TFT	CRUSOE	733Mhz	20Gb	128Mb	£1439	£1690.83
Vaio PCG-R60HFPD TFT	PIII	1000Mhz	30Gb	256Mb	£1439	£1690.83
Vaio PCG-NV105 TFT/DVD	P4	1.6Mhz	30Gb	256Mb	Call	Call
Vaio PCG-NV109M TFT/CDRW	P4	1.6Mhz	30Gb	256Mb	Call	Call
Vaio PCG-SR41P TFT	PIII	800Mhz	30Gb	256Mb	£1479	£1737.83
Vaio PCG-F601 TFT/DVD	AMD	1.1Mhz	20Gb	256Mb	£889	£1044.58
Vaio PCG-SR415MPTFT/DVD	P4	1.6 Ghz	30Gb	256Mb	Call	Call
Vaio PCG-GM165PFT CDRW/DVD	P4	1.8 Ghz	40Gb	512Mb	Call	Call

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
A10DXTX CD TFT	AMD	1.0Mhz	10Gb	128Mb	£725	£856.58
A10DXTD DVD TFT	AMD	1.1Mhz	10Gb	128Mb	£859	£1029.33
A10DXTC DVD/CW	AMD	1.1Mhz	20Gb	128Mb	£949	£1126.58
G710DXTX CDRW/TFT	PIII	1000Mhz	20Gb	128Mb	£1129	£1326.58
T10XVC DCDRW TFT	P4	1.6Mhz	30Gb	256Mb	£1719	£2019.83
T10XVC DCDRW TFT	P4	1.7Mhz	40Gb	256Mb	£1899	£2231.33

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
Sat 1800 CD TFT	CP	1100Mhz	15Gb	128Mb	£699	£821.33
Sat 1800DVD TFT	CP	1000Mhz	20Gb	128Mb	£999	£1173.83
Sat Pro 6000 CD TFT	CP	1066Mhz	20Gb	128Mb	£945	£1110.38
Sat Pro 6000 CD/TFT	PIII	1000Mhz	20Gb	128Mb	£1049	£1232.58
Sat Pro 6000 DVD TFT	PIII	1066Mhz	20Gb	256Mb	£1369	£1608.58
Sat Pro 6000 DVD TFT	PIII	1200Mhz	40Gb	256Mb	£1799	£2113.83
Portege 4000 CT TFT	PIII	750Mhz	20Gb	128Mb	£1529	£1796.58
Tecra 9000 CD/TFT	PIII	933Mhz	10Gb	128Mb	£1249	£1467.58
Tecra 9000 DVD TFT	PIII	1000Mhz	20Gb	256Mb	£1575	£1850.63
Tecra 9000 DVD TFT	PIII	1200Mhz	30Gb	256Mb	£1925	£2261.88

cd drives

Model	Ex VAT	Inc VAT
CRW 164040 SCSI Internal	£95	£111.63
CRW 201040 IDE CD Writer	£130	£152.75
CRW 161040 SCSI CD Writer Ext	£135	£158.63

Model	Ex VAT	Inc VAT
Burnproof IDE 16x10x32	£60	£70.50
CD Writer USB Ext. 4x4x24	£109	£128.08
CD Writer/DVD Combo 6x4x24x4	£125	£146.88

Model	Ex VAT	Inc VAT
CD 12ri 32x12x10 IDE Drive	£99	£116.33
CD 9710i 40x16x10 IDE Drive	£122	£143.35
CD 8230e 6x4x4 Ext USB Drive	£135	£158.63
CD 9600SI 32x12x8 Int SCSI	£155	£182.13

tape drives

Model	Ex VAT	Inc VAT
SureStore DAT 8Gb Int Kit	£449	£527.58
SureStore DAT 8Gb Ext Kit	£509	£598.08
SureStore DAT 24Gb Int Kit	£599	£703.83
SureStore DAT 24Gb Ext Kit	£669	£786.08

Model	Ex VAT	Inc VAT
Zip 100 Mb USB External	£50	£58.75
Zip 100 USB Starter Kit	£61	£71.68
Zip 250 Mb External SCSI	£110	£129.25
Zip 250 Pro Kit Parallel	£111	£130.43
Zip 250 Mb External USB	£115	£135.13
Click PC Card Drive	£75	£88.13

EPSON EMP 50



Model	Ex VAT	Inc VAT
EMP 50	£1399	£1643.83
EMP 70	£1699	£1996.33
EMP 50S	£2299	£2701.33
EMP 713	£2499	£2936.33
EMP 715	£2999	£3523.83
EMP 7600	£4150	£4876.25
EMP 8100	£5999	£7048.83

Model	Ex VAT	Inc VAT
cBright SV2 LC4433	£1399	£1643.83
cBright SV2 LC4431	£1769	£2078.58
cBright XG2 LC4441	£1799	£2113.83
cBright XG2L	£2375	£2790.63

Model	Ex VAT	Inc VAT
CS4 PS1	£1279	£1502.83
CK3 PS1	£2099	£2466.33
CK4 PS1	£1969	£2313.58
CK4 PS3	£2239	£2630.83

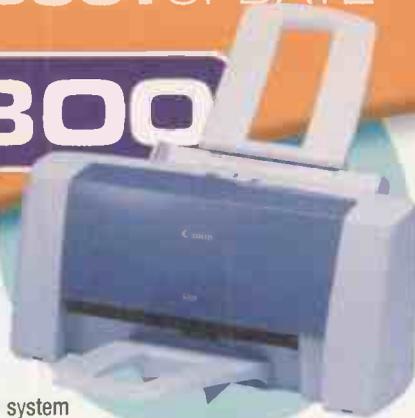


Canon

imaging across networks.

PRODUCT UPDATE

S300



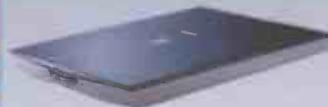
the professional quality colour printer for home users

- 2400 x 1200 dpi resolution
- Print speeds up to 11ppm in mono and 7.5ppm in colour
- Outstanding print quality through the use of Microfine Droplet Technology
- Ink Low/Ink out detection
- High speed auto sheet feeder system
- High Colour inks
- Suitable for all popular computer platforms - easy connection via USB

£77.00
ex VAT

£90.48 inc VAT

CANOSCAN N670U



high quality digital imaging made simple

- Stylish Ultra slim design
- Advanced Z lid expands to accommodate books and magazines
- Upright scanning for the smallest installation footprint
- 3 EZ scanning buttons - Scan, Copy, E-mail
- 600 x 1200 dpi optical resolution for high image quality
- 48 bit internal colour depth for superb colour accuracy

£54.00
ex VAT

£63.45 inc VAT

CANOSCAN D1250U2



1200 x 2400dpi for high image quality

- 48 bit internal colour depth for accurate colour recognition
- Dual USB 1.1 and USB 2.0 interface
- 3 EZ Scan buttons - Scan, Copy & Email
- Advanced Z-lid expands to accommodate scans from books and magazines
- Multi Photo Mode - automatic identification, crop and straightening of multiple images

£93.00
ex VAT

£109.28 inc VAT

CANOSCAN D2400U



ultra high quality A4 flatbed scanner

- 2400 x 4800 dpi optical resolution giving high image quality
- 48 bit internal colour depth
- Fast scanning preview times for high speed operation
- USB connectivity for fast effortless installation
- Stylish, modern desktop design w. optional film adapter unit
- Supports: Windows 98, ME, 2000, Mac OS 8.5 or later

£217.00
ex VAT

£109.28 inc VAT

S200

The high quality colour printer for the home

- 2880 x 720 dpi resolution
- Print speeds up to 5ppm in mono and 3ppm in colour
- High speed auto sheet feeder system with relay feeding
- Ink Low/ink out detection
- High Colour inks: greater colour range & high optical density
- Vivid Photo allows the printer to produce a wider range of colours, ensuring optimum colour reproduction
- Suitable for all popular computer platforms - easy connection via USB

£46.00
ex VAT

£54.05 inc VAT

S520

The high speed, high quality office printer for the home

- 2440 x 1220 dpi resolution
- Print speeds up to 14ppm in mono and 9ppm in colour
- Advanced Microfine Droplet Technology
- Single Ink technology providing superb cost efficiency
- High Colour inks: greater colour range & high optical density
- Vivid Photo allows the printer to produce a wider range of colours, ensuring optimum colour reproduction
- USB and Parallel connectivity
- Ink Low/ink out detection
- Borderless printing

£116.00
ex VAT

£136.30 inc VAT

S750

The ultimate colour printer for speed and quality

- 2440 x 1220 dpi resolution
- Print speeds up to 20ppm in mono and 13ppm in colour
- Advanced Microfine Droplet Technology
- Single Ink technology providing superb cost efficiency
- High Colour inks: greater colour range & high optical density
- Precision Colour Distribution Technology delivers faster colour print speeds at extremely high quality levels
- Vivid Photo ensures optimum colour reproduction
- USB and Parallel connectivity
- Borderless printing
- Ink Low/ink out detection

£147.00
ex VAT

£172.73 inc VAT

S820D

The direct photo printer for digital photography

- Photo direct/PC card slot
- 2440 x 1220 dpi resolution
- Print speeds up to 4ppm in mono and 4ppm in colour
- Advanced Microfine Droplet Technology
- High Colour inks: greater colour range & high optical density
- 1/6 density photo inks
- Vivid Photo ensures optimum colour reproduction
- Borderless printing
- Ink Low/ink out detection
- Easy connection via USB

£255.00
ex VAT

£299.63 inc VAT

S900

The state of the art photo printer

- 2440 x 1220 dpi resolution
- Print speeds up to 7ppm in mono and 7ppm in colour
- Advanced Microfine Droplet Technology
- Single Ink technology provides superb cost efficiency
- High Colour inks: greater colour range & high optical density
- 1/6 density photo inks
- Vivid Photo ensures optimum colour reproduction
- Borderless printing
- Ink Low/ink out detection
- Easy connection via USB

£255.00
ex VAT

£299.63 inc VAT

S9000

The professional photo printer for wide format printing

- 2440 x 1220 dpi resolution
- Print speeds up to 9ppm in mono and 6ppm in colour
- Advanced Microfine Droplet Technology
- Single Ink technology provides superb cost efficiency
- High Colour inks: greater colour range & high optical density
- 1/6 density photo inks
- Vivid Photo ensures optimum colour reproduction
- Borderless printing
- Ink Low/ink out detection
- Easy connection via USB

£349.00
ex VAT

£410.08 inc VAT



POWERSHOT A30

£185.00
ex VAT

£217.38 inc VAT

NEW

- 1.2 mega pixel CD
- 3 x optical zoom (35-105mm equivalent)
- 2 x digital zoom
- 3 point AIAF, single centre point
- Optical & LCD viewfinder
- Selectable metering modes, exposure controls and white balancing modes
- Movie capture mode
- Operates on AA batteries



POWERSHOT A40

£225.00
ex VAT

£264.38 inc VAT

NEW

- 2.0 mega pixel CD
- 3 x optical zoom (35-105mm equivalent)
- 2.5 x digital zoom
- 3 point AIAF, single centre point
- Optical & LCD viewfinder
- Selectable metering modes, exposure controls and white balancing modes
- Movie capture mode with sound
- Operates on AA batteries



POWERSHOT G2

£559.00
ex VAT

£656.83 inc VAT

- High resolution CCD with 4.0 million pixels
- High performance 3 x zoom
- 34-102mm zoom lens f2.0 - 7.0
- Vari-angle LCD monitor
- 3.5 step-lease digital zoom
- 12 shooting and 3 Af modes
- Compact Flash Type I & II
- Wide range of dedicated PowerShot lenses
- Compatible with full range of EX Speedlites



DIGITAL IXUS V2

£295.00
ex VAT

£346.63 inc VAT

- Ultra compact classic design
- 2.11 mega pixel CCD for superb detail
- 35-70mm F2.8 - 4.0 2 x zoom
- 2.5 Digital Zoom
- Movie mode with sound capture
- 3 point intelligent autofocus ensures great shots every time
- 1.5" LCD TFT screen provides review and playback facility
- USB Interface for rapid image transfer



IXUS 330

£335.00
ex VAT

£393.63 inc VAT

- Stylish design and ultra-compact 3x optical zoom lens (35-105) digital camera
- High image quality with 2.11 pixel CCD, intelligent auto exposure system, high speed adaptive image processor
- Maximum image quality - minimum effort
- Superior features and ease of use
- Long battery life
- System accessories extend camera capabilities
- Compatible with Windows 98, 2000, Windows ME & Mac



MV 550i

£599.00
ex VAT

£703.83 inc VAT

- 7 programmed AE modes
- Audio Dubbing and Digital effects
- 10x Optical Zoom lens / 200 x Digital Zoom
- Electronic Image Stabilisation
- Progressive Photo Button
- 2.5" LCD Screen/Multi Image Screen
- DV Out and DV In terminal



cameras



MINOLTA		EPSON		KODAK	
VAT	Inc VAT	VAT	Inc VAT	VAT	Inc VAT
Dimage E201	£145	PhotoPC 2100Z	£272	DX3215	£139
Dimage S304	£295	PhotoPC 3100Z	£416	DX 3500	£140
Dimage 5	£469			DX 3600	£179
CANON		FUJI		SONY	
VAT	Inc VAT	VAT	Inc VAT	VAT	Inc VAT
Powershot A30	£185	FinePix A101	£121	MVC FD75	£287
Powershot A40	£225	FinePix A201	£155	MVC FD200	£365
Digital IXUS V2	£295	FinePix 2600Z	£199	Cybershot P31	£169
Digital IXUS 330	£335	FinePix 301	£232	Cybershot P51	£209
Powershot S30	£399	FinePix 6800	£389	Cybershot P71	£259
AV5001	£465	FinePix 4800	£325	Cybershot DSC-S75	£440
AV5501	£599	FinePix F601	£429	Cybershot DSC-S85	£515
OLYMPUS		NIKON			
VAT	Inc VAT	VAT	Inc VAT		
C-100	£115	Coolpix 2500	£229		
C-120	£120	Coolpix 885	£309		
C-220	£155	Coolpix 995	£459		
C-700	£330	Coolpix 995 Premier	£590		
C-3020	£369				
C-40	£449				

- massive warehouse stocks
- next day delivery for UK mainland
- phone lines open 6 days a week
- on-site showroom facility
- internet security for online shopping

take time to check out...

printers

HEWLETT PACKARD		EPSON	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
Deskjet 350C	£137	LX300+	£97
Deskjet 350CBI	£156	FX800	£261
Deskjet 656C	£48	FX980	£314
Deskjet 845C	£64	FX1170	£202
Deskjet 920	£70	FX1180	£314
Deskjet 940	£80	FX2180	£386
Deskjet 960C	£115	LQ300	£112
Deskjet 990CXI	£153	LQ580	£216
Deskjet 1125C	£180	LQ680	£224
Deskjet CP1160	£202	LQ780	£266
Deskjet CP1700	£255	LQ2080	£336
Deskjet 1220C	£207	LQ2180	£479
Busines 2200XI	£264	DLQ3000+	£850
Busines 2250	£399	DFX5000+	£1259
PhotoSmart P1115	£139	DFX8500	£1854
PhotoSmart P1215	£175	Stylus Color C20SX	£44
PhotoSmart P1315	£227	Stylus Color C40SX	£56
Laserjet 1000	£178	Stylus Color C60	£59
Laserjet 1200	£230	Stylus Color C70	£89
Laserjet 1200N	£349	Stylus Color C80	£116
Laserjet 2200N	£525	Stylus Photo 810	£74
Laserjet 2200DT	£622	Stylus Photo 890	£126
Laserjet 4100	£767	Stylus Photo 895	£133
Laserjet 4100N	£975	Stylus Photo 950	£281
Laserjet 4100TNI	£1043	Stylus Photo 1290	£259
Laserjet 4100DTN	£1239	Stylus Photo 2000P	£444
Laserjet 5000	£965	Stylus Color 1160	£192
Laserjet 5000N	£1399	Stylus Colour 1520	£315
Laserjet 5000GN	£1729	Stylus Colour 3000	£744
Laserjet 8150	£1519	Stylus Pro 5000	£957
Laserjet 8150N	£1779	EPL-5900L	£159
Laserjet 8150DN	£2159	EPL-5900	£199
PSC 750	£161	EPL-5900PS	£269
Officejet V40	£160	EPL-N2050	£351
PSC 950	£232	EPL-N2750	£579
Officejet K80	£199	Aculaser-C1000	£765
Laserjet 3200	£410	Aculaser-C1000N	£849
		Aculaser-C2000	£1280
		Aculaser-C4000	£1949
BROTHER		OKI	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
HLL230	£155	ML280	£192
HLL450	£219	ML320	£321
HLL470N	£322	ML321	£384
HLL650	£399	ML380	£225
HLL850	£499	ML390F	£279
HLL870N	£599	ML3320	£289
HLL2460	£629	Okipage 8P Plus Laser Printer	£199
HLL2460N	£799	Okipage 14ex LED Printer	£215
HLL3260N	£1379	Okipage 14ex LED Printer	£249
HLL3260N	£1699	Okipage 14i/n LED Printer	£332
HL2400 Ce Laser	£1129	Okipage 20+ LED Printer	£569
HL2400 CeN Laser	£1325		
HL 3450CN Laser	£2179		
KYOCERA		QMS	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
FS1000	£229	PagePro 1100L	£169
FS1800	£559	PagePro 1100	£210
FS3800	£729	PagePro 9100	£1029
FS6700	£955	Magicolor 2200	£729
FS7000+	£1679	Magicolor 2210GN	£69
FS9000	£1899	Magicolor 2200GN	£1599
		Magicolor 6100DL	£1549
CANON		TEKTRONIX	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
BJC 55 Colour	£202	Phaser 750N	£1246
BJC 85 Col	£169	Phaser 750P	£1439
S100	£46	Phaser 860N	£1679
S300	£77	Phaser 860DP	£2649
S520	£116	Phaser 2135N	£2979
S750	£147	Phaser 2135DT	£4099
S6300	£294		
S900	£255		
S9000	£349		
S820	£255		
CD300 Dye-Sub	£329		
BJC5500 Inkjet	£433		
LBP810 Laser	£162		
HEWLETT PACKARD		EPSON	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
Scanjet 3400C	£59	Perfection 1250U	£67
Scanjet 4400	£75	Perfection 1250U Photo	£90
Scanjet 5400C	£120	Perfection 1640SU	£187
Scanjet 5470C	£159	Perfection 1650U Scanner	£112
Scanjet 7400C	£295	Perfection 1650U Photo	£134
Scanjet 7450C	£359	Perfection 2450 Photo	£224
Scanjet 7490C	£519	Expression 1600 Scanner	£495
		Expression 1600 Pro	£650
UMAX		MICROTEK	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
Astra 3400U	£51	ScanMaker 3800	£57
Astra 3450U	£76	ScanMaker 4800U	£85
Astra 5400U	£85	ScanMaker 5600	£149
Astra 5450U	£127	ScanMaker 5700	£279
Astra 6400F	£170	ScanMaker X120SL	£175
Powerlook 1100 Graphic	£749	FilmScan 35	£121
Powerlook 1100 Pro	£809	ScanMaker 8700	£539
Powerlook 2100XL Pro	£2199	ScanMaker 9600XL	£799
AGFA		CANON	
Ex VAT	Inc VAT	Ex VAT	Inc VAT
Snapscan e20	£59	Canon N640Pex	£54
Snapscan e25	£77	Canon N670U	£54
Snapscan e40	£126	Canon N1250U2F	£93
Snapscan e50	£145	Canon N1250U2F	£132
Arcus 1200	£455	CanonScan D2400UF	£294
		CanonScan FS2710	£349
		CanonScan FS4000	£543

MONITOR DEALS FROM PHILIPS



150S £267.00 Ex VAT
£313.73 Inc VAT

- 15" colour LCD monitor with excellent display performance
- 1024 x 768 Resolution
- Analog video interface with advanced one touch AUTO adjustment
- Wide Viewing Angle Technology
- LCD Screen Damage
- Optional Protective Cover to Prevent LCD Panel Damage
- Optional USB Hub
- 3 Year On-Site Exchange Warranty



150P2 £365.00 Ex VAT
£428.88 Inc VAT

- 15.1" colour monitor with excellent display performance and viewing size comparable to a 17" monitor
- 60% smaller footprint than comparable CRT monitors - only 165mm deep
- Advanced AUTO adjustment automatically optimises picture quality
- Dual Input - DVI Digital and VGA analog
- Built-in, front firing stereo speakers and microphone for video conferencing
- Optional protective cover to prevent LCD panel damage
- Standard VESA mounting holes and optional tilt/swivel Wall Mount Kit



150X £459.00 Ex VAT
£539.33 Inc VAT

- 15.1" colour LCD monitor with exclusive executive design and excellent display performance
- New DVI standard for both digital and analog interface
- Wide Viewing Angle technology
- Front firing speakers with 36W PMPO stereo sound output
- Sliding height adjustment for the best viewing position
- AUTO adjustment automatically optimizes picture quality



180P £749.00 Ex VAT
£880.08 Inc VAT

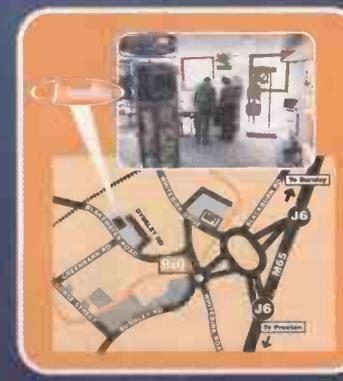
- 18.1" colour LCD monitor with excellent display performance and same viewing size as a 19" CRT monitor
- Dual input accepts both DVI Digital and VGA analog input
- Advanced AUTO adjustment automatically optimises picture quality
- Wide Viewing angle technology
- Built-in, front firing stereo speakers and microphone for video conferencing and multimedia applications
- 7.1" (181mm) small footprint with full detachable cables
- Optional protective cover to prevent LCD panel damage
- Standard VESA mounting holes and optional tilt/swivel Wall Mount Kit



TOP QUALITY AT THE RIGHT PRICE!

MINOLTA DIMAGE X

£299.00 Ex VAT
£351.33 Inc VAT



Privilege accounts

with exclusive discounts are available to:

- Corporate clients
- Educational/Higher Education establishments
- Government/Local Government
- Health Authorities

Speak to our Privilege Sales Team NOW on 01254 505505

FOR MORE INFORMATION OR TO PLACE YOUR ORDER CALL

01254 505 505

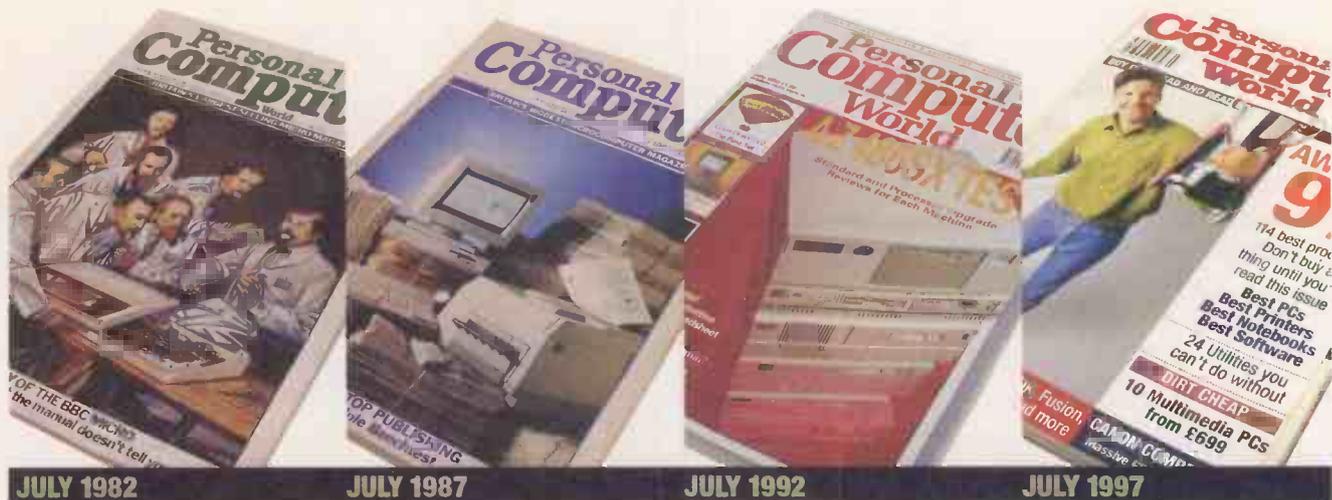
FAX 01254 691466 • WEB WWW.JAVELINCOMPUTERS.COM
EMAIL SALES@JAVELINCOMPUTERS.COM

OPEN 6 DAYS A WEEK MON - FRI 9AM - 6PM SAT 9AM - 1PM
JAVELIN HOUSE • 3 GREENBANK BUSINESS PARK • DYNELEY ROAD • BLACKBURN • LANCs • BB1 3AB

Delivery charges - Computers £30.00 (£35.25 inc VAT). Printer & Peripherals £12.00 (£14.10 inc. VAT) • Collections by appointment only • Goods are not sold on a trial basis, please check specification and suitability with manufacturer before ordering • Goods offered subject to our standard terms and conditions available on request • E&OE



LEISURE LINES FLASHBACK



JULY 1982
 PCW went BBC Micro mad in July 1982, with a series of articles covering every aspect of one of Britain's best-loved computers, from its core components to the Basic operating system. Back then, the Micro was still a new machine, and our readers were interested to see just how far it could be pushed. With this in mind, PCW examined the various software options and its expansion capabilities.

If you've forgotten how impressive the Micro was, a

JULY 1987
 Browsing through old Issues is always a pleasant experience, and if you're not careful you may find yourself harking back to the old days and droning on about how things were better then. That's until you see the prices. Back in 1987, a 3.5in floppy drive could set you back a terrifying £250.

The main feature of the July issue back in 1987 was a review of a desktop publishing outfit from Atari. More associated with games, it had produced a software and printer

JULY 1992
 Many strange pieces of hardware pass through the PCW offices, some of the strangest being the Philips CD-I and the CDTV from Amiga. These CD-based home computers, forerunners to modern-day games consoles, were reviewed head-to-head by Chris Cain.

After rigorous testing and careful consideration, he concluded that the CD-I was the better of the two, being the 'best piece of hardware' that he had seen in the whole of his five years as a PCW writer. He was convinced it would be yet another five years at least before the market could produce anything to top it. However, neither format managed to gain mass popularity due to their limited functionality and expensive hardware.

From computers to components: this was the month that ATI released the VGAStereo FX, a combined Super VGA graphics card, sound card and mouse controller.

With 1MB of graphics memory it had to be imported from across the Atlantic and would have set you back a staggering \$399. For a similar price today you can get your hands on a top of the range Geforce4 Ti4600.

A 25-machine PC group test by Mat Beard covered the recently introduced 486SX processor, with a manufacturer for every letter of the alphabet – with the exception of Y.

A less technically sophisticated product also appeared in the news pages: programmers' favourite Jolt Cola finally reached the UK, priced at £1.10 and sold in specialist outlets. An informal poll in the PCW office, however, showed that most of the team didn't really care all that much for the latest drink fad.

JULY 1997
 The mass-market rollout of ADSL may only be happening now, but back in July 1997, PCW was already discussing it in the news pages. We explained how this new technology, soon to be released by BT, was to be a medium for delivering TV pictures. While some services – notably Home Choice – are indeed doing this, most of us now use it for Internet access.

At the same time there was talk of 56K modems and how their uptake had been slow. At the time only two UK ISPs supported such technology.

Windows 98 was still some way off at the time, but PCW took a look at an early beta copy in the July 1997 issue, alongside covering the new USB standard, and the products that would eventually take advantage of this fast interface.

July 1997 saw the presentation of the annual PCW awards, in which DVD was declared 'most innovative technology'. Reviews of interest included the Matrox Millennium II and Videologic Apocalypse 3D, the latter being the first real competitor to 3Dfx's Voodoo range.

Also on test were four tape backup drives, with Seagate coming out as the winner for its good price-to-performance ratio. Back then, a 4GB tape would be enough to back up your entire hard drive twice over – or perhaps even more. If only the same could be said today. The software section ran a head-to-head comparison of Dragon Dictate Solo and Voice Type Simply Speaking, both the first generation of voice recognition packages. They may not have been as sophisticated as more recent versions but were still very functional – as long as you had a powerful PC to run them on.

Lars-Goran Nilsson



The HP-28C was one of the most advanced calculators on the market in 1987, although by today's standards it would be considered very low tech

quick look back over the specs reveals that it had support for networking, modems and dual-processor operation. A workshop on making sounds with your Micro and an in-depth look at the Basic Rom, complete with a comprehensive list of useful commands and routines rounded everything off well.

Other products to grace the PCW office included the Newbrain, a portable computer with a built-in 16-character display. Sadly, it wasn't battery powered, so couldn't be used on the move. Dick Pountain, meanwhile, was lucky enough to bag a trip to Nice to look at Texas Instruments' latest programmable calculator. These pocket-sized beasts were the PDAs of their day, with prices to match, this one tipping the scales at £289.95.

combo that you connected to an Atari Mega ST4. This was still a prototype, but it marked Atari's first major move into the business market.

Yet again, PCW took a look at calculators – this time the HP-28C, one of the most advanced on the market. Many of its functions were preprogrammed, which was quite uncommon for a piece of 1987 kit, and if you wanted a hard copy of your calculations you could also invest in an infra-red thermal printer.

It seems unbelievable that Dell, now arguably the dominant player in the PC market, only made its PCW debut in 1987 when it submitted the Dell 286-12. Robert Schifreen put it through its paces and came to the conclusion that £2,400 inc VAT was a little pricey for a 286 chip running at 12MHz.



High-street legend

We trace the beginnings of the Tandy TRS-80, the first mass-marketed computer

Ahh, Tandy! There can be few readers of *PCW* without fond memories of perusing electronics components in this high-street legend.

Most regulars also knew that Tandy stores were called Radioshack in the US, but few could explain why, or what happened to Tandy in the end. We'll now reveal **all** in the story of the TRS-80: the first mass-marketed personal computer.

The TRS-80 story starts with friends Norton Hinkley and Dave L Tandy who met by chance in Fort Worth, Texas during 1919, and decided to start the Hinkley-Tandy Leather Company.

Two years later, brothers Theodore and Milton Deutschmann opened a store in Boston, supplying equipment to ship radio operators and ham enthusiasts. The brothers christened the store Radioshack, after the nautical term for the room above the ship's bridge, traditionally housing the radio equipment.

Back to Hinkley-Tandy, which was doing well, despite the great depression and World War II. After serving in the Navy, Charles D Tandy (Dave's son) returned to Fort Worth but clashed with Hinkley. The company split with Dave and Charles forming the Tandy Leather Company in 1950.

Over to Radioshack, which, in the early 1960s, was established but had fallen on hard times. Chairman Charles D Tandy, now interested in electronics, saw the Radioshack chain as an opportunity for growth and snapped it up in 1963.

During the early 1970s, the CB radio craze saw Radioshack enjoying enormous growth and, by 1975, the Tandy Corporation dealt exclusively with electronics. But just a year later the CB market collapsed, leaving Tandy/Radioshack on the search for a new profitable electronics venture.

At this time, the first personal computers had just arrived, but they were far from consumer styled or priced. The MITS Altair was little more than a DIY box with lights and switches, while the Apple I was financially out of reach for Tandy's customer base. Like most companies of the day, Tandy also suspected personal computers were just another fad.

Don French, a buyer for Tandy and dedicated computer hobbyist, was convinced otherwise. He and Tandy executive John Roach persuaded the company in 1976 to develop a personal computer for Radioshack. French then got to work with Steve Leininger, who had previously been head of the legendary Homebrew Computer Association.

The Tandy Radioshack, or TRS-80, was announced on 3 August 1977 and priced at just \$599. It featured a 1.77MHz Z80 processor, 4KB of Ram, Basic in a 4KB Rom, and employed a modified 12in RCA mono TV for a screen.

The TRS-80 may have been cheap for a personal computer, but it was Radioshack's most expensive item, and the company initially feared it may be stranded with 3,000 unsold units. Swamped with orders, Radioshack ended up selling almost 55,000 TRS-80s in its first year and 200,000 during the Model-I's four-year lifespan.

In 1979, the Model-II arrived, with a faster CPU and 8in disk drives. The Model-III followed in 1980 along with a Colour Computer, affectionately known as the Coco. While the TRS-80 product line sold far better than expected, Tandy was also producing increasingly popular Intel-based alternatives. In 1984, the almost 100 per cent IBM PC-compatible Model-1000 became Tandy's best selling computer, signalling the end for the proprietary TRS-80. After building MS-Dos machines for some years afterwards, the Tandy computer division was bought by AST in 1993.

But what happened to the Tandy stores in the UK and why were they never known as Radioshack? Allegedly Tandy was never allowed to use the name Radioshack in the UK because it was already owned by an electronics shop on London's Finchley Road, which refused to sell it.

As far as Tandy's UK high-street presence was concerned, Carphone Warehouse bought all 270 outlets in 1999. Since then, the stores have gradually turned into either Carphone Warehouses, or a subsidiary such as Tecno Camera, itself later acquired by Jessops.

In 2000, the Tandy Corporation was renamed Radioshack Corporation, and it remains a dominant force in the US: an estimated 94 per cent of all Americans live or work within five minutes of a Radioshack store or dealer, while 99 per cent of American households visit one of the stores at least once every three years. At least we still have Maplin.

Gordon Laing



EST.
1984

power computing Ltd

unit 82a
singer way
woburn rd ind. est.
kempston
bedford
mk42 7pu

t 01234 85 1500

all products ready to ship with
2 years parts & labour warranty

Unbelievable Prices!

Power Networker 1GHz DDR PC

- ATX Micro Tower Case
 - MSI Socket A MS- 6390L Motherboard 266 FSB
 - 1x AGP 3x PCI 2x USB 1x Parallel
 - AMD Duron 1GHz Socket A CPU
 - 128MB DDR PC2100
 - A/C 97 On-Board Sound Card
 - 20GB UDMA 100 EIDE 5400RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - 52x CDROM Drive IDE
 - Integrated S3 Savage 3D Graphics Card (Can share Up-To 32MB)
 - Integrated 10/100 Network Card
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£319.95~~ NOW **£299.95** **Save £20!**

Power Evo Athlon XP1600+ DDR PC

- ATX Micro Tower Case
 - MSI Socket A MS- 6390L Motherboard 266 FSB
 - 1x AGP 3x PCI 2x USB 1x Parallel
 - AMD Athlon XP 1600+ (266MHz FSB)
 - 256MB DDR PC2100
 - A/C 97 On-Board Sound Card
 - 40GB UDMA 100 EIDE 5400RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - 52x CDROM Drive IDE
 - Integrated S3 Savage 3D Graphics Card (Can share Up-To 32MB)
 - Integrated 10/100 Network Card
 - 56.6K V92 Internal Hardware Modem
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£409.95~~ NOW **£399.95** **Save £10!**

Power Tower XP1800+ PC

- ATX Midi Tower Case 300Watt
 - MSI K7T Turbo2 Socket A Motherboard
 - 1x Agp 5x PCI 4x USB 1x Parallel 266FSB
 - AMD Athlon XP 1800+ (266MHz FSB)
 - 256MB SDRAM (133MHz)
 - A/C 97 On-Board Sound Card
 - 40GB UDMA 100 EIDE 5400RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - Aopen (Burnproof) 32x12x48 CDRW
 - Nero CD Burning Software
 - Nvidia MX400 64 MB AGP Inc.TV Out
 - 56.6K V92 Internal Hardware Modem
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£559.95~~ NOW **£539.95** **Save £20!**

Power Gamer XP1800+ DDR PC

- ATX Midi Tower Case 300Watt
 - MSI KT3 Ultra Motherboard Skt A DDR
 - 1x Agp 5x PCI 4x USB 1x Parallel
 - AMD Athlon XP 1800+ (266MHz FSB)
 - 256MB DDR PC2100
 - On-Board 6 Channel Audio Sound Card
 - 40GB UDMA 133 EIDE 7200RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - Aopen (Burnproof) 32x12x48 CDRW
 - Nero CD Burning Software
 - Nvidia GeForce4 MX440 64 MB AGP Inc.TV Out (includes 3x Games)
 - 56.6K V92 Internal Hardware Modem
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£649.95~~ NOW **£629.95** **Save £20!**

Power Intel P4 1.8GHz DDR PC

- ATX Midi Tower Case 300Watt
 - MSI 845 Ultra Socket 478 Motherboard
 - 1x Agp 5x PCI 4x USB 1x Parallel
 - Intel Pentium 4 1.8Ghz Socket 478 (512k cache)
 - 256MB DDR PC2100
 - A/C 97 On-Board Sound Card
 - 40GB UDMA 133 EIDE 7200RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - Aopen (Burnproof) 32x12x48 CDRW
 - Nero CD Burning Software
 - Nvidia MX400 64 MB AGP Inc.TV Out
 - 56.6K V92 Internal Hardware Modem
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£689.95~~ NOW **£669.95** **Save £20!**

Mean Machine XP1800+ DDR PC

- ATX Midi Tower Case 300Watt
 - MSI KT3 Ultra ARU Motherboard Skt A DDR
 - 4xUSB2.0 Raid Included
 - 1x Agp 5x PCI 4x USB 1x Parallel
 - AMD Athlon XP 1800+ (266MHz FSB)
 - 512MB DDR PC2100
 - On-Board Sound Card 5.1 Surround Sound
 - 40GB UDMA 133 EIDE 7200RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - 1.44MB Floppy Disk Drive
 - Aopen (Burnproof) 32x12x48 CDRW
 - Nero CD Burning Software
 - GeForce 3 Titanium 200 128 MB DDR AGP Inc. Video In and Video Out
 - 56.6K V92 Internal Hardware Modem
 - 2 Year Parts & Labour Warranty
 - Free Software Installation Manual
- Monitor & Software (OS) not included

WAS ~~£799.95~~ NOW **£779.95** **Save £20!**

Power Millennium XP1800+ DDR PC

- ATX Midi Tower Case 300Watt
 - MSI KT3 Ultra Motherboard Skt A DDR
 - 1x Agp 5x PCI 4x USB 1x Parallel 266FSB
 - AMD Athlon XP 1800+ (266MHz FSB)
 - 256MB DDR PC2100
 - On-Board 6 Channel Audio Sound Card
 - 40GB UDMA 133 EIDE 7200RPM HD
 - Logitech PS/2 Keyboard
 - Logitech 3 Button Wheel Mouse
 - Hansol 17" 720E Colour Monitor .27Pitch
 - 200Watt Speakers
 - 1.44MB Floppy Disk Drive
 - Aopen (Burnproof) 32x12x48 CDRW
 - Nero CD Burning Software
 - Nvidia GeForce 4 MX440 64 MB AGP (includes 3x Games)
 - 56.6K V92 Internal Hardware Modem
 - MS Windows XP Home, MS Works 2000, MS Money, Revenge of the Arcade, MS Bookshelf, Anti Virus Software
 - 2 Year Parts & Labour Warranty
- Complete System

WAS ~~£899.95~~ NOW **£879.95** **Save £20!**

Built to your specification

Can't find a system to suit your needs? Let us custom-build your PC for you!

Power PC Clinic

Get your PC problems diagnosed and cured by our specialist technicians.

Call - Click - Visit!

01234 85 1500
sales@powerc.com

www.powerc.com

All prices include VAT.



FREE UK MAINLAND DELIVERY on all ON-LINE ORDERS!

No Surcharge on Credit Cards!

www.powerc.com

New Lower Prices!

UPGRADE YOUR PC FOR LESS!!!

CPU's

Table listing CPU models and prices: AMD Duron 1GHz (£42.95), AMD Athlon XP 1600+ 1.4Ghz (£84.95), AMD Athlon XP 1700+ 1.47Ghz (£94.95), AMD Athlon XP 1800+ 1.53Ghz (£104.95), AMD Athlon XP 1900+ 1.6Ghz (£133.95), AMD Athlon XP 2000+ 1.67Ghz (£179.95)

Hard Drive Upgrades

Table listing hard drive models and prices: Maxtor 20GB 5400RPM IDE HD (£59.95), Maxtor 20GB 7200RPM IDE HD (£69.95), Maxtor 40GB 5400RPM IDE HD (£69.95), Maxtor 40GB 7200RPM IDE HD (£79.95), Maxtor 60GB 5400RPM IDE HD (£89.95), Maxtor 60GB 7200RPM IDE HD (£99.95), Maxtor 80GB 5400RPM IDE HD (£109.95), Maxtor 80GB 7200RPM IDE HD (£119.95), Maxtor 120GB 5400RPM IDE HD (£179.95), Maxtor 160GB 5400RPM IDE HD (£259.95)

Motherboards

Table listing motherboard models and prices: MSI 6340M SKT A 266FSB ATX S3 Savage & sound on-board (£79.95), MSI K7T Turbo2 SKT A 266FSB ATX (£79.95), MSI KT3 Ultra DDR (£99.95), MSI KT3 Ultra ARU DDR USB2.0 Raid SKT A (£124.95)

Graphics Cards

Table listing graphics card models and prices: Nvidia Riva TNT M64 32MB AGP (£39.95), MSI Nvidia GeForce 2 MX400 64 MB AGP Inc. TV Out (£69.95), MSI Nvidia GeForce 4 MX440 64 MB AGP DDR Inc. TV Out (£99.95), MSI Nvidia GeForce 4 MX460 64 MB AGP DDR Inc. Video In & Out (£119.95), MSI GeForce 3 Titanium 200 128MB AGP Inc. Video In & Out (£149.95), MSI GeForce 4 Titanium 4400 128 MB DDR Inc. Video In & Out (£249.95), MSI GeForce 4 Titanium 4600 128 MB DDR Inc. Video In & Out (£329.95)

Cases

Table listing case models and prices: Micro ATX Tower Case 230 Watt PSU (£39.95), Aopen Midi Tower Case 250 Watt PSU HQ45 (£49.95), Aopen Midi Tower Case 300 Watt PSU HQ45 (£59.95)

Sound Cards

Table listing sound card models and prices: Soundblaster 128 PCI (£19.95), Soundblaster Live! Player 5.1 (£34.95), Soundblaster Audigy Player (£79.95), Soundblaster Extigy (External USB) (£139.95)

Modems

Table listing modem models and prices: 56.6k V90 Internal PCI Hardware Modem (£14.95)

Speakers

Table listing speaker models and prices: Teac Speakers Powermax 240watt (£19.95), Labtec LCS-2414 1x Sub Woofer 2x Speakers (£29.95), Labtec LCS-2514 1x Sub Woofer 4x Speakers (£39.95), Teac Speakers Powermax 500 B Sub Woofer 2x Speakers (£49.95), Creative Inspire 5.1 5300 Speakers 1x Sub Woofer 5x Speakers (£99.95)

Keyboards & Mice

Table listing keyboard and mouse models and prices: Logitech 3 Button Wheel Mouse (£9.95), Logitech Cordless Wheel Mouse (£19.95), Logitech Optical Wheel Mouse (£14.95), Logitech Cordless Mouseman Optical Mouse (£44.95), Logitech DeLuxe Keyboard (£14.95), Logitech DeLuxe Keyboard & 3 Button Wheel Mouse (£19.95), Logitech Cordless Desktop Keyboard & Mouse (£39.95), Logitech Cordless Desktop itouch Keyboard & Mouse (£69.95), Logitech Cordless Desktop Optical Keyboard & Mouse (£89.95)

USB Ports

Table listing USB port models and prices: USB 4 Port Internal PCI (£19.95), USB 2.0 4 Port Internal PCI (£39.95)

Motherboard Bundles (assembled)

Table listing motherboard bundle models and prices: ATX Micro Tower Case, MSI Socket A MS-6340M Motherboard 266 FSB, 1x AGP 3x PCI 2x USB 1x Parallel On-board Sound, On-board S3 Savage 3D Graphics Card (can share up to 32MB), AMD Duron 1GHz Socket A CPU Inc. Fan & Heatsink, 128MB SDRAM (133MHz) (£199.95)

Table listing motherboard bundle models and prices: ATX Midi Tower Case 300Watt PSU, MSI K7T Turbo2 SKT A 266FSB ATX, UDMA 100 1x AGP 6x PCI 4x USB 1x Parallel On-board Sound, AMD Athlon 1.4 GHz (266MHz FSB) Inc. Fan & Heatsink, 256MB SDRAM (133MHz) (£284.95)

Table listing motherboard bundle models and prices: ATX Midi Tower Case 300Watt PSU, MSI KT3 Ultra SKT A 266FSB DDR ATX, UDMA 133 1x AGP 5x PCI 4x USB 1x Parallel On-board Sound, AMD Athlon XP 1700+ (266MHz FSB) Inc. Fan & Heatsink, 256MB PC2100 DDR SDRAM (£324.95)

Colour Monitors

Table listing monitor models and prices: Hansol 15" 28 Pitch (510A) (£99.95), Hansol 17" 27 Pitch (720E) (£119.95), Hansol 17" 25 Pitch Dynafast (710D) (£159.95), Hansol 19" 26 Pitch (920P) (£179.95), Hansol 19" 25 Pitch Dynafast (920D) (£249.95), Hansol 15" TFT Flat Panel (H520) (£299.95), Hansol 17" TFT Flat Panel (711) (£499.95)

Optical drives

Table listing optical drive models and prices: LG CD Rom 52x EIDE (£24.95), LG 16x DVD Drive 48x CD (£49.95), LG Combi CDRW/DVD 12x8x32CD 8xDVD (£99.95), Aopen CDRW 24x10x40 (£69.95), LG CDRW 32x10x40 (£84.95), Aopen CDRW 32x12x48 (£89.95), TEAC CDRW 40x12x48 (£114.95)

SEE WEBSITE FOR MORE GREAT OFFERS DAILY!

100 Blank CDR 80min 32x including wallets only £23.50!

USB Infra red adapter Communicate with your PC from your mobile phone! only £34.95!

MEGA MEMORY SALE! WHILE STOCKS LAST!

128MB SDRAM 168PIN 133mhz WOW PRICE! £24.95

256MB SDRAM 168PIN 133mhz WOW PRICE! £49.95

512MB SDRAM 168PIN 133mhz WOW PRICE! £99.95

128MB PC2100 DDR SDRAM (184PIN) WOW PRICE! £29.95

256MB PC2100 DDR SDRAM (184PIN) WOW PRICE! £59.95

512MB PC2100 DDR SDRAM (184PIN) WOW PRICE! £119.95

All prices include VAT.

All power computing pcs are subject to availability and come with 2 year return to base, parts & labour warranty (free collection & return) unless otherwise specified by manufacturer. Industry standard practice is to quote a monitor crt size, the actual size is one inch less. details correct at time of going to press. prices, specifications subject to change without notice. all sales are subject to power computing ltd terms and conditions. a copy of which may be obtained on request. all trademarks are acknowledged. all prices include vat.

E & OE

Most Major Credit Cards Accepted



July

COVER DISC



Full version

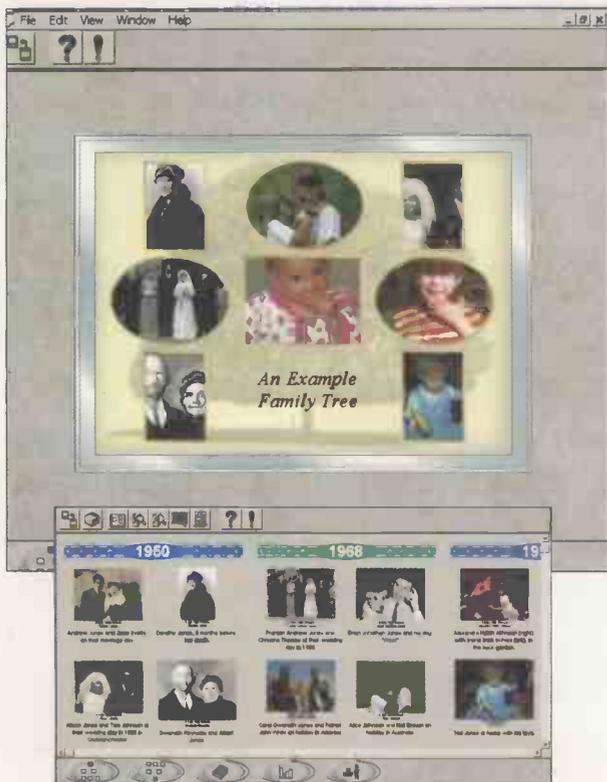
GSP Family Tree

CONTACT www.gsp.cc

GSP's Family Tree comes with all the necessary tools for classifying and sorting your genealogical data. With this program you will be able to create records of family members and establish their relationships, create certificates for birth, christening, marriage, death and burial events, attach sounds and pictures to family members, and view or print them just like a family photo album.

You can also tell the story of family life through the years using a timeline display, view and print tree diagrams illustrating ascending and descending relationships, gain insight into family history with statistics of the evolving population, life expectancy, marriages and births, and import and export your data in the Gedcom file format.

A comprehensive manual offers help and advice as well as tips on general research techniques. You can access this, once installed, through the Windows Start menu. See our full review in *PCW* June p69.



Full versions

Security and Standards Growl II

CONTACT www.secstan.co.uk

Growl II makes an assessment of every web page you visit by checking elements concerned with the site's security level. That assessment is compiled into a rating using a traffic light system. A green light means this page meets all the requirements you have set for a site to be considered secure. An amber light means transact with care. This page is not fully secure. You should only transact through this site or provide sensitive information with caution. A red light means it is unsafe to transact. This page is not secure, so you should not transact with this site, or provide any sensitive information.

Growl II integrates with your web browser – when you launch the program, your web browser automatically launches.

JGA Project Companion

CONTACT www.jgaconsult.co.uk

Project Companion has been developed to offer essential hints, tips and terminology definitions to help users get more out of Microsoft Project. It has not been designed to be a training course for those who plan and manage projects. The 26 topics within Project Companion have been chosen to illustrate best practices in applying Microsoft Project to a real environment. Project management skills are also covered within the first eight topics of Project Companion as a planning primer.

Top to bottom:

Growl II

Nero 5.5

Nero Sound editor



This primer explains how and why projects can be planned more effectively and how these skills relate to Microsoft Project specifically. The remaining 18 topics apply best-practice project planning to Microsoft Project. They provide step-by-step guidance on how features can be implemented, or how information can be interpreted.

COVER DISC NOTES



Trial versions

Ahead Software Nero 5.5

CONTACT

www.nero.com/en/nero55.htm

If you're into CD recording, version 5.5 of Nero gives you full support to produce both data and video DVDs. Whether you want to back up your hard drive or compile music, Nero will do it. You can even design and print a disc cover and label using the Cover Editor.

Pure Motion Edit Studio 3

CONTACT www.puremotion.com

Edit Studio is suitable for any type of editing task, with support for both digital and analogue video. Edit Studio's video capture supports both Firewire and analogue cards. The program uses a standard Windows interface. The main window shows all the program's features in a 'flat' interface. All the main editing operations can be done using drag and drop technology.

Simply add, move and resize items by dragging with the mouse. If you require precision, editing can be performed using the more pop-up menus and dialogue boxes. The program has 99 levels of undo/redo. You can use Edit Studio's Media Explorer to manage your source media files.

Media Explorer also allows you to store preset effects and transitions. This makes it easy to maintain a similar style throughout. The program preview is available at all times to give a preview of any part of the movie. There's no need to pre-render a preview before you can see it. Edit Studio is built around the

new Windows video technologies, removing the old 2GB maximum file size. For Windows 95 and 98 this means that 4GB files can be used and for Windows NT4 and 2000 there is no limit. Under Windows 98SE or ME, DV capture allows you to capture as a number of 4GB files. See also our review on page 77.

Roxio WinOn CD 5 Power Edition

CONTACT www.roxio.de/english

This is a comprehensive multimedia software tool for creating your own projects with music, video and photos. This version combines new optimised features with a friendlier interface. Edit music and create video CDs, DVDs and make backups and copies of CDs. WinOn CD 5 Power Edition includes Roxio DirectCD, CD Emulator, CheckCD, Video CD Player, VCD Photo Album, VCD Music Album, MP3 Project and more. Features include:

- Create audio CDs from Wav, MP3 and WMA files
- Internet support
- Support of CD text
- Blend between audio titles
- Sound editor with effects
- VCD music albums – reproduction on PC/DVD; 99 albums per CD
- MP3 encoding and creation of MP3 CDs
- Add pictures or text to MP3 files
- MP3 project with Playlist-Editor
- Video CD and Super VCD
- Creation of interactive films
- Add 99 video titles on one menu
- Create the VCD navigator simply
- Automatic encoding of files as mpeg-1 for VCD
- Video CD player

- CD-Rom/DVD-Rom emulator for playing on PC
- VCD photo album – high-resolution slide shows on TV

Entech Powerstrip

CONTACT www.entechtaiwan.com/ps.htm

Powerstrip 3.15 provides advanced, multi-monitor, programmable hardware support to a wide range of graphics cards – from the Matrox Millennium I to the latest Radeon 8500DV and Geforce4 Ti4600. It is the only utility of its type to support multiple graphics cards from multiple chipset vendors simultaneously, under every Windows OS.

A menu that pops up from the system tray provides access to 500 controls over your display hardware, including colour correction tools, period level adjustments over screen geometry, and driver independent clock controls.

An application profiler can detect when programs are launched and activate specific display settings, gamma adjustments, performance switches and clock speeds – returning everything to normal when the program closes. In-game camera hotkeys let you light up the darkest hallways during game play, while hardware control over refresh rates ensure you're never stuck at 60Hz no matter what OS you're using.

A quick setup wizard gets you up and running with minimal fuss, extensive context-sensitive help is available for controls, and live updates are supported to ensure you're running the latest release.

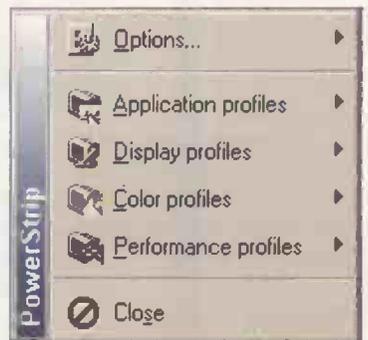
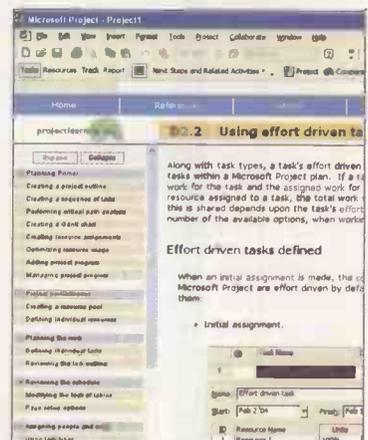
Check out our feature on page 94 for more tips on how to get the most of your graphics cards.

Project Companion

Edit Studio 3

Powerstrip menu

Powerstrip monitor management



COVER DISC NOTES



What's on the DVD

If you've bought the DVD-Rom edition of *PCW*, you'll find everything from the CD edition plus the extra goodies described below

Full versions

Carbon Viewlet Builder 2

www.productivity4you.com

Viewlet Builder is the powerful, yet ingeniously simple tool for creating Viewlets – visually rich, yet extremely compact movie files. The enhanced features of this Freeware Edition make it a great introduction to Viewlet technology.

Viewlets can transform static text help files into something more appealing. Each Viewlet opens in its own unique Java-enabled browser window (requiring no plug-ins). Since Viewlet files are small, any dial-up user with a 56K modem can watch the demo. You can fill your site with compelling multimedia demos, in any language, in a matter of hours.

To get you started, you'll find a large number of example/tutorial Viewlets in the folder `\software\viewlets_example\`.

As long as a browser is Java enabled, it should be able to play Viewlets. The following PC browsers are compatible: Netscape 4.06 (or later), Internet Explorer 4.0 (or later), AOL 4.0, and Opera 5.x. Mac browsers include Internet Explorer 4, Netscape 6.x, and AOL 4.0 or later.

Mandrake Linux 8.2

www.linux-mandrake.com/en

Mandrake Linux is a complete preconfigured graphical Linux operating system. It's easy to install, use and is stable. We included Mandrake on last month's DVD-Rom. Unfortunately, there was a problem with the ISO disc image for disc 3 (Mandrake extensions).

So, here it is again with a new disc 3 ISO file. To create your installation disc set use a CD-R burner and software such as Easy CD Creator or Nero (Nero 5.5 is included on this month's CD and DVD-Rom).

The three image files can be found in `\software\mandrake\`.

VIEWLET BUILDER SPECIAL OFFER

Productivity4you is offering *PCW* readers the opportunity to upgrade to Viewlet Builder Pro with a discount of £25. Please contact Penny Parker on 01202 821 002 or email on pparker@productivity4you.com or offers@productivity4you.com. Alternatively go to www.productivity4you.com to take advantage of the offer.

Playable games demos

2002 FIFA World Cup

Take your country to 2002 FIFA World Cup victory. This EA Sports game features officially licensed uniforms, teams, players, and commentators. Stadiums are complete with crowd celebrations and special effects.

Universal Monsters

Headed by Dracula & Frankenstein, the monsters have got it in their heads to stand in the next Monsterville elections. Other characters include Quasimodo and the Phantom of the Opera. The 3D cartoon-style game, a blend of humour and strategy, was developed by Intelligent Game.

Beam Breakers

Giants of steel, concrete, and glass dwarf buildings that once dominated the skyline. Rush hour traffic isn't what it used to be either. Anti-gravity technology means the skies are filled with high-tech automobiles. Among the commuters, rival gangs run illegal sky races... the 'beam breakers'.

Plus...

The Secret of Nautilus, Blood Omen 2 (trailer), New Dominoes 1.1, Six Trix; Cycleman, Freedom Force, Space Horse, and Starships Unlimited: Divided Galaxies.

Essentials

50 top utilities and add-ins

`\software\essentials\`

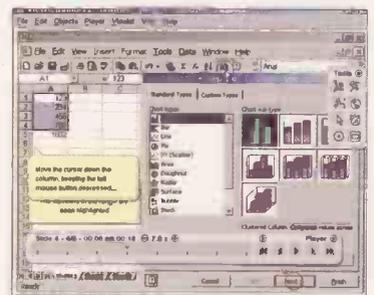
More than 50 of the top programs and add-ins, sorted into five categories – Internet, Office, Creative, Utilities, and Others.

Editorial

PCW product group tests

Two years of product tests from the pages of *PCW*, including desktop PCs, anti-virus software, CD writers, databases, digital cameras, DTP software, hard drives, image editors, monitors, motherboards, notebooks, PDAs, printers, visual programming software, webcams, DVD-Rom drives, scanners and more – up to and including the May 2001 issue. You'll also find a selection of workshops, from ecommerce to upgrading your motherboard. These are all presented as Adobe Acrobat files. You can browse or search each feature, copy text directly from the documents, or print them.

Top to bottom:
Universal Monsters
Secret of Nautilus
Mandrake Linux 8.2
ViewletBuilder 2



READER PANEL

We need you!

Help us keep *Personal Computer World* the magazine you want to read

In order to keep your magazine up to date, we need regular feedback to help us tailor *Personal Computer World* to the changing needs of you, our readers. The best way of doing this is by talking to readers directly, so we're setting up a panel of *Personal Computer World* readers who we can contact every now and then to find out what they think. As an incentive, all panel members will be entered into a draw to win a mystery prize.

How it works

At various times during the next 12 months, we will select a random cross-section of panel members to take part in a survey. If you are selected, we will send you a copy of the latest issue (unless you are already a subscriber, of course). A week or so later, when you've had an opportunity

to read it, we will either email you and direct you to an online survey where we'll ask you about various aspects of the magazine, or telephone you with a short questionnaire. It really is as simple as that and we promise not to contact you more than three times in any 12-month period.

During the year, we will select at random one lucky panel member who will win the mystery prize.

If you are interested in becoming one of our panel members, you need to have access to the Internet. To apply just fill in the form below and return it to us free of charge. If you don't want to cut this page, you can download the form from www.pcw.co.uk/News/1131632. Alternatively you can email your answers to readerpanel@pcw.co.uk and register that way.

Thanks for joining in and good luck in the prize draw!



Reader panel

Please return from to: *Personal Computer World* Reader Panel, VNU Business Publications Ltd, Freepost 25, Lon 1414, London W1E 1RN

Title Mr Mrs Ms Miss

Initial Surname

Address

Town

County Postcode

Email address

Telephone number

Mobile number

Fax number

Date of birth (dd) (mm) (yy)

Male Female

Occupation

We may use the contact details supplied to communicate with you regarding *Personal Computer World*.
If you are also happy for us to contact you about other products or services available from *Personal Computer World* and the VNU Business Publications Ltd Group please indicate here. Contact by: Email Telephone Mobile
If you are happy for us to pass your details on to other carefully selected companies to contact you about their products or services please indicate here. Contact by: Email Telephone Mobile
If you do NOT wish us to contact you BY POST about products or services available from *Personal Computer World* or the VNU Publications Ltd Group please indicate here
If you do NOT wish us to pass your details on to other carefully selected companies to contact you BY POST about their products or services please indicate here

Which of the following magazines do you read and how often?

	Every issue	Fairly frequently	Occasionally	Never
Computeractive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Buyer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Shopper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Weekly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MacUser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Micro Mart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.net	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Network News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Answers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Format	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Guide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Know How	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Magazine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Plus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Pro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PC Zone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Webactive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What PC?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you read *Personal Computer World*?

I have a subscription

I buy every issue/almost every issue

I buy most issues (around three out of four)

I buy it once every three or four issues

I only buy it occasionally (around twice a year or less)

This is the first time I have bought it

How long have you been reading *Personal Computer World*?

Less than 1 year 2-4 years 5-7 years 8-10 years 11+ years

Do you have Internet access?

Yes, at home

Yes, at work

Yes, at home and work

No

Have you ever visited www.pcw.co.uk and how often do you visit?

Yes - Regularly

Yes - Fairly frequently

Yes - Occasionally

No - Never



PERSONAL COMPUTER WORLD

next month...

75 Office tips and tricks

Almost everyone knows how to use a word processing program or spreadsheet, but can you do more than just type in words and numbers? We've rounded up 75 top hints, tips and tricks to help you make full use of Microsoft Office.

Computer noise

As PCs have become faster and more powerful, they have also become more noisy. *PCW* puts an ear to the ground and tells you how you can diminish the din of your PC.

High-street computers

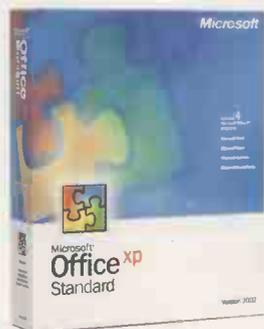
There are many ways to buy a PC, but one the most popular and convenient ways is to pop down to your high street and pick one up. We take a look at the latest models on offer and give you some solid buying advice along the way.

Graphics cards

We round up over 30 of the latest graphics cards available, tell you about the chip technology behind them and put them through our rigorous testing. Find out who comes out on top.

pcwexpert Instant messaging

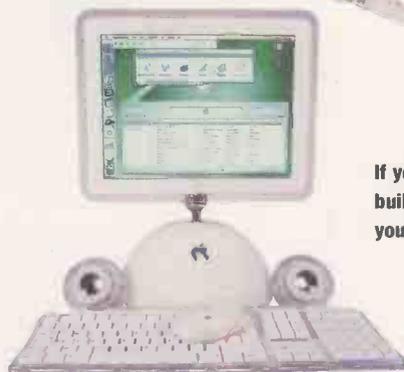
Everyone's at it, but what makes it tick? We dig deep into instant messaging and explain what it's all about



Find out some of the tricks of the trade and learn how to use Office better



Get the best picture possible with our graphics card group test



If you don't want to custom-build a system, find out what you can buy off the shelf

Reserve your copy now! Newsagent Order Form

Guarantee a copy of *PCW* by handing this form to your local newsagent.

Please reserve me a copy of *Personal Computer World* every month

Personal details

Name: _____

Address: _____

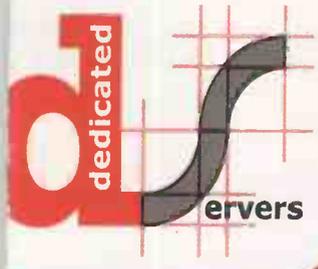
Postcode: _____

Daytime phone: _____

**PERSONAL
COMPUTER
WORLD**

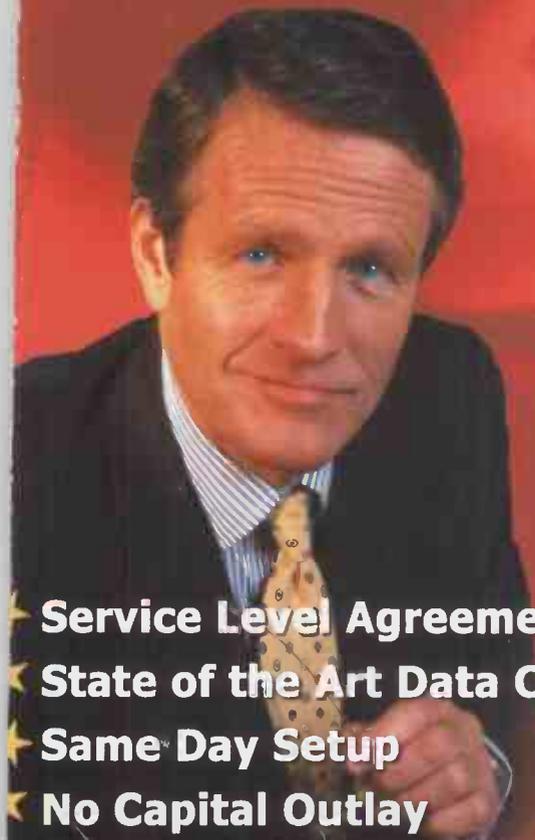
**There's lots
more in August's
PCW, on sale
Thursday
27 June 2002,
don't miss it...**

Contents subject to change



dedicated servers

A Commitment to Success



- Service Level Agreement
- State of the Art Data Centre
- Same Day Setup
- No Capital Outlay

Are you outgrowing virtual hosting? Running into extra costs for high bandwidth use, more domains and email? Does the server itself seem slow and inflexible? Does your web designer keep saying there are so many things you could be doing if only you had more speed and space, and access to the 'workings' of the server? Your accountant won't let you spend a fortune on leased lines and computers. Maybe you don't have the technical staff to maintain your own network anyway. Well, you have no choice but to put up with virtual hosting, right?

Wrong. The serious solution to web hosting is a dedicated server, and it's within your reach now. You can benefit from high value Service Level Agreements just like the biggest players in your industry. You can enjoy the speed and flexibility of your own server in one of the country's leading Data Centres. You can even choose a server that's as technically simple to operate as virtual hosting, but without the restrictions. Your web designer will be happy.

So will your accountant, because dedicated servers cost less than you think. In fact, they can even work out cheaper than your existing virtual hosting arrangements. You get all the flexibility, all the control, all the speed and room for growth, and all at NO CAPITAL COST. Interested? Call us now.

Additional services such as co-location, system monitoring, firewalls, security services, system backups, managed system administration also available, contact us for details.

LINUX SERVERS



The industry standard operating system for web hosting and Internet services. RedHat Linux configured and running on one of our high speed servers. Apache, Sendmail, Perl, CGI and FTP configured and running as standard.

from £99.99 to £449.99 per month

WINDOWS SERVERS



Ideal for MSCP's, MCSE's, Visual Basic programmers, projects that require Active Server Pages, SQL or office components. Windows 2000 or NT installed & configured. DNS, IIS and MS Frontpage Server Extensions included as standard.

from £199.99 to £549.99 per month

SINGLE SITE SERVERS



A unique product that's as easy to use as a virtual server, but on a standalone dedicated web server. Includes the easy to use Virtual Control Panel 2001, 24 hour technical support by e-mail and phone - all hosted in our state of the art data centre facility.

£99.99 per month FREE SETUP

COBALT RAQ SERVERS



The high end "web-in-a-box" solution. Easy to use, no jargon or systems know-how required. Ideal for web designers, resellers, entrepreneurs etc. Add virtual servers, configure e-mail addresses, activate autoresponders over the Internet all in real time.

from £99.99 to £199.99 per month



0870 012 6600

www.dedicated-servers.co.uk

PRICES EXCLUDE VAT AND SETUP. ALL TRADEMARKS ARE THE REGISTERED PROPERTY OF THEIR RESPECTIVE OWNERS.

Want more for your money? Try our new FS-8000C colour workgroup printer.

You get A4. You get A3. You get high quality colour. You get glossy. You get black and white for next to nothing.

You get easy use. You get an easy fit to your office network. You get the option of stacking, stapling, sorting, collating for whatever finishing you want.

Best of all, you get amazingly low running costs. Our unique ECOSYS technology saves up to two thirds compared to other printers. So you can afford to use colour whenever you want.

Get the low-down on the FS-8000C at this web address. And get more than colour for your money.

www.businesscolour.co.uk

Call 01189 230 622

Kyocera Mita offers a comprehensive range of copiers, printers and multifunctional products.

Introducing **Colour ECOSYS**:

"You won't believe how much you get for your money."



ECOSYS

286

KYOCERA MITA CORPORATION
www.kyoceramita.com

connect.print.copy.forget